

Fig. 1 et 2. Foyer de la locomotive Crampton.

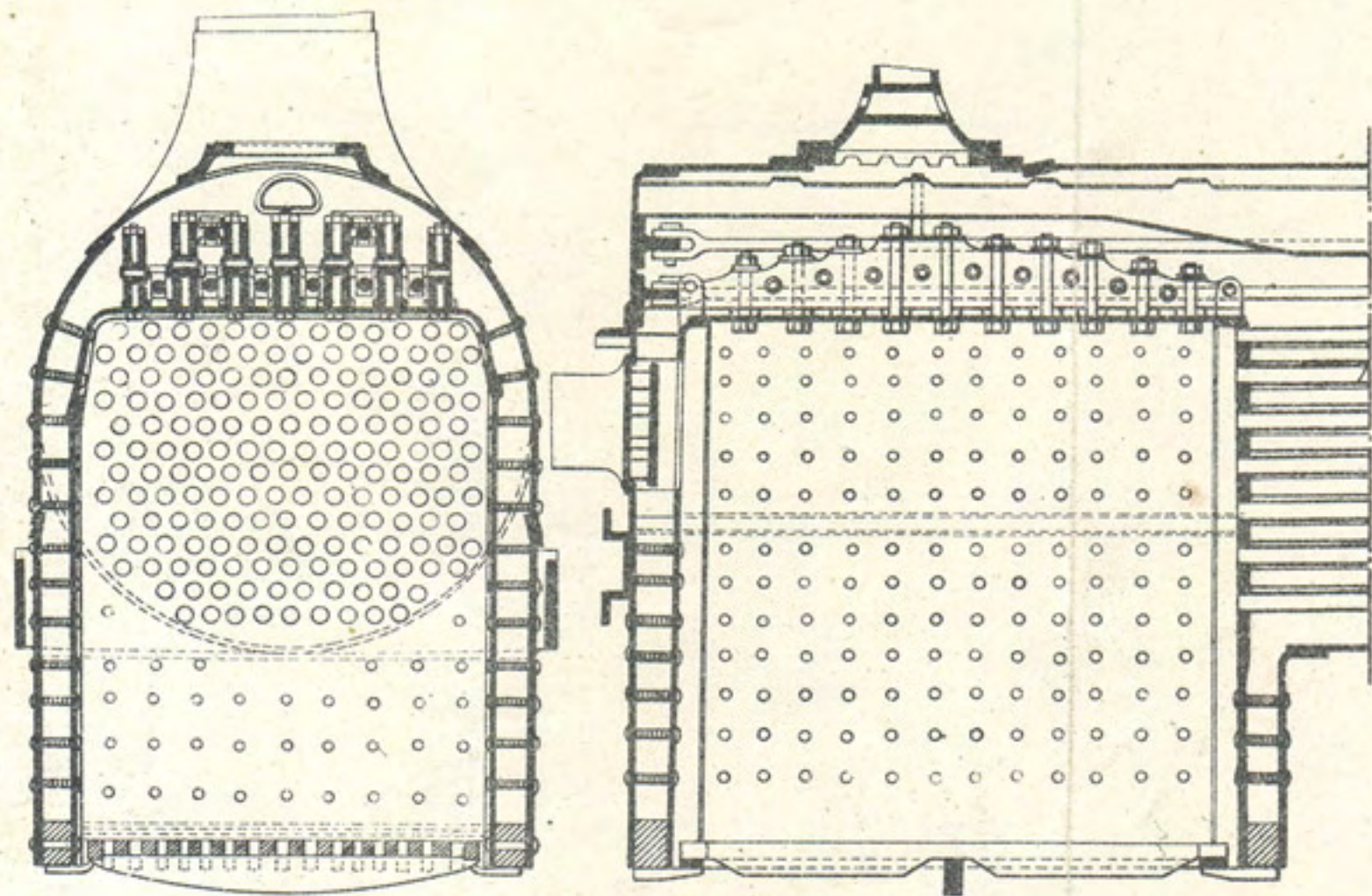


Fig. 3. Foyer Belpaire à sommiers transversaux.

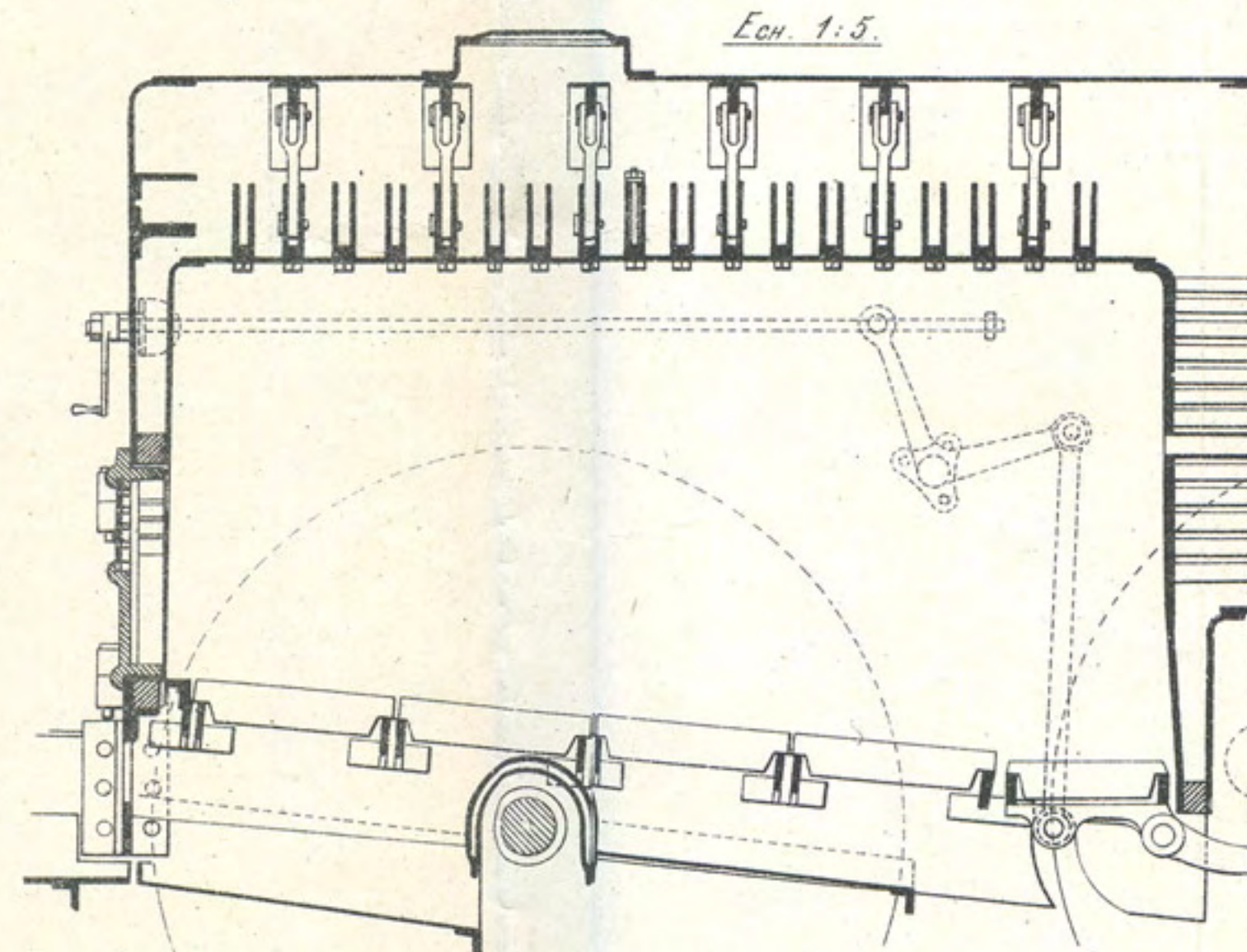


Fig. 4. Foyer de Cologne-Minden.

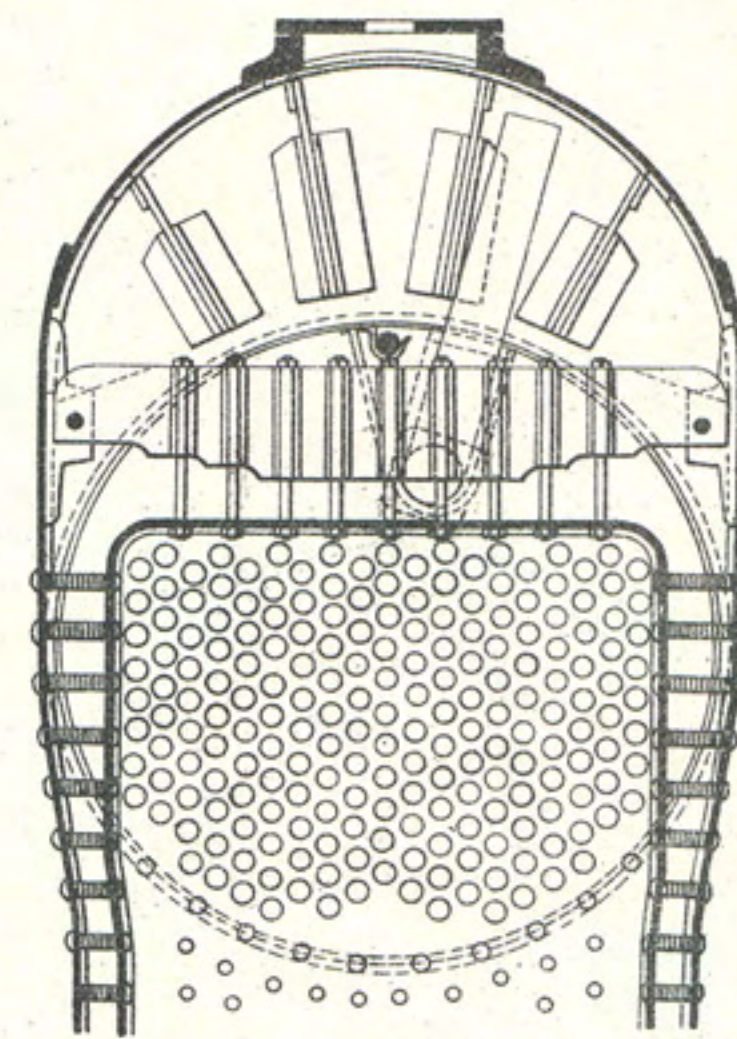


Fig. 5. Foyer système Linder.

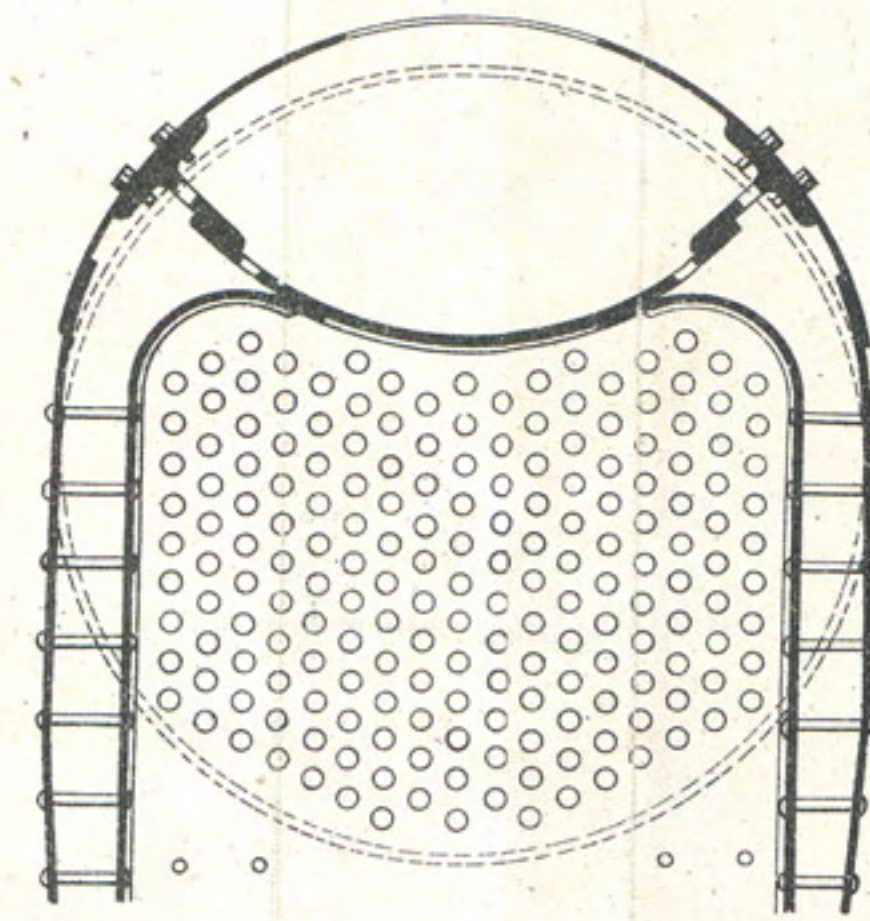


Fig. 6. Foyer de la locomotive compound de Webb. (L. et N.W.R.)

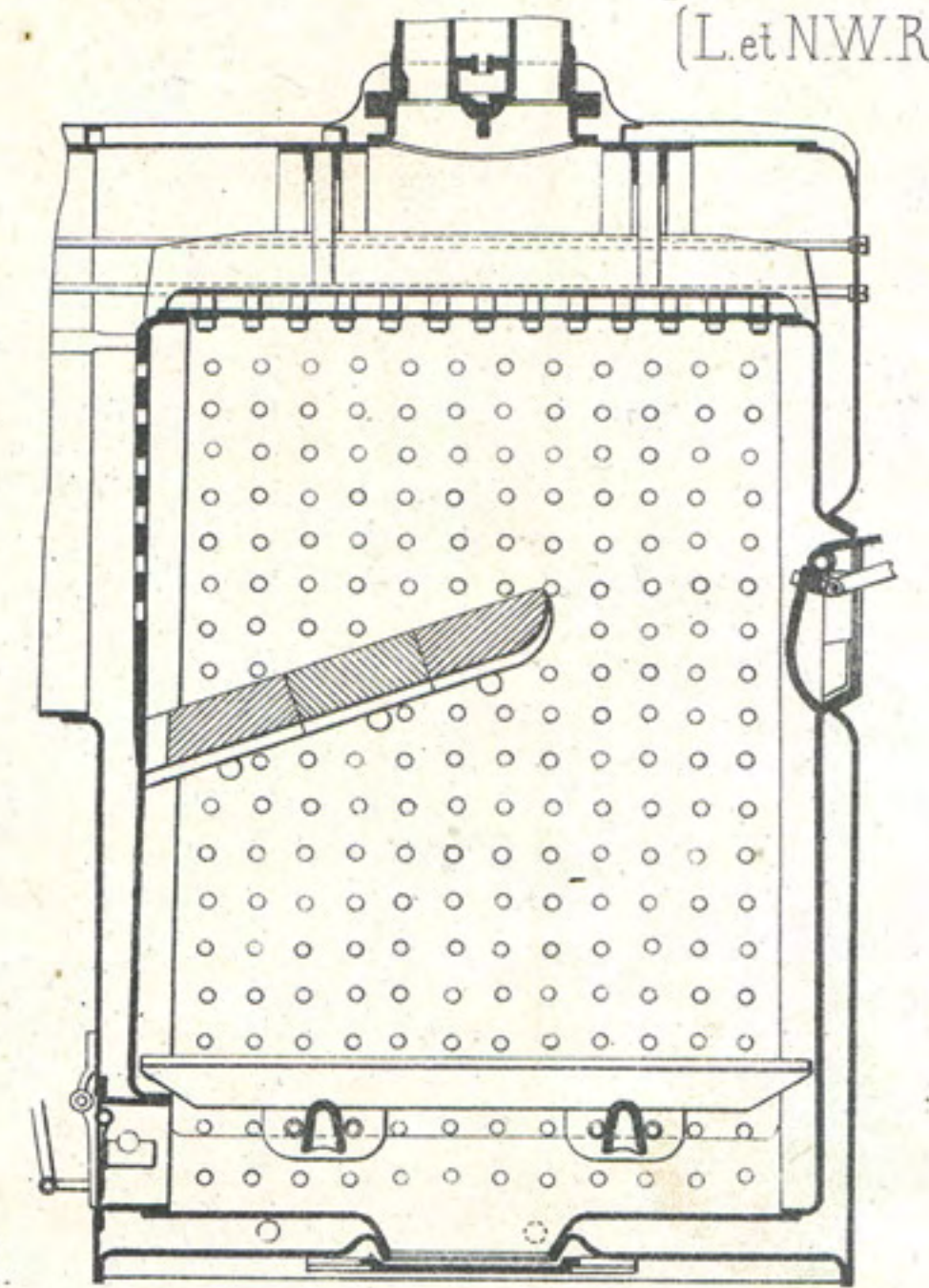


Fig. 7 et 8. Foyer système Polonceau.

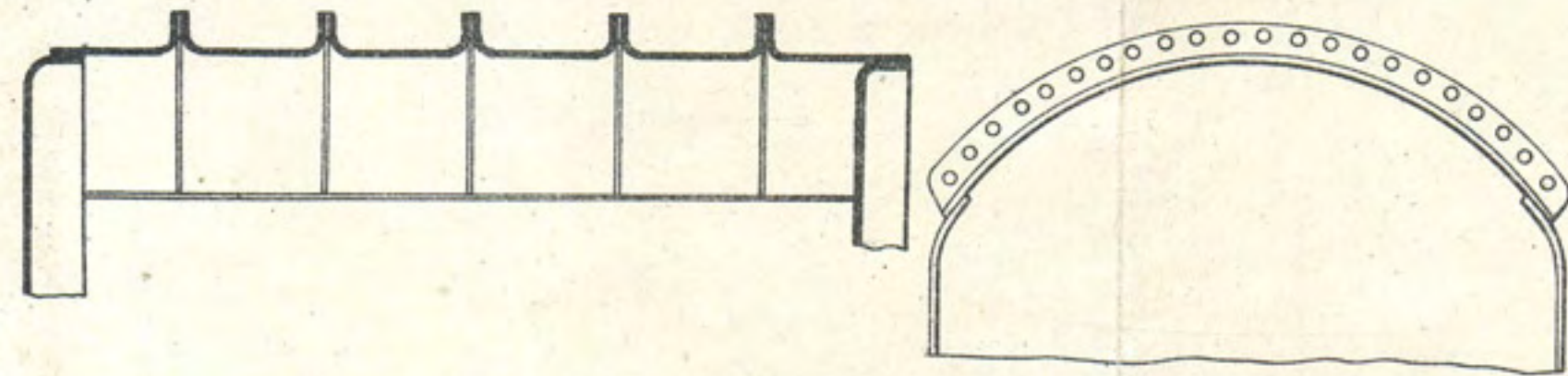


Fig. 9 et 10. Foyer Belpaire. (Brevet Dean et Laevitt).

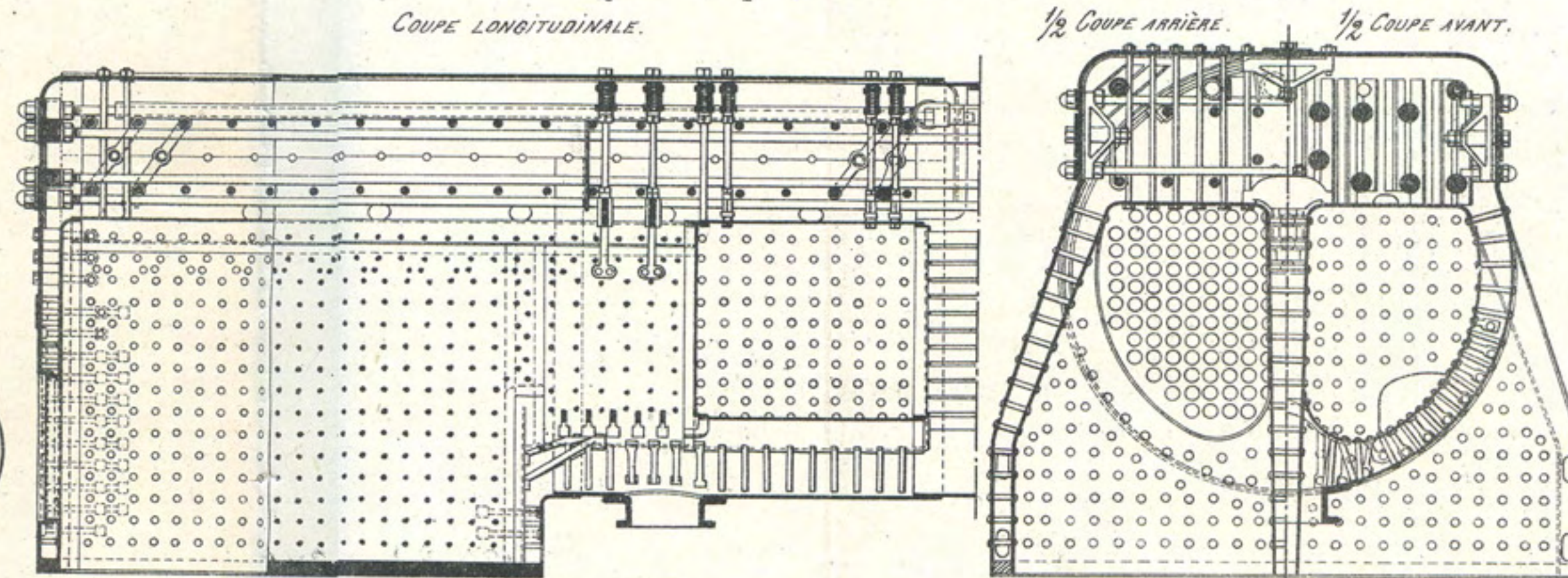


Fig. 11 et 12. Porte de foyer.

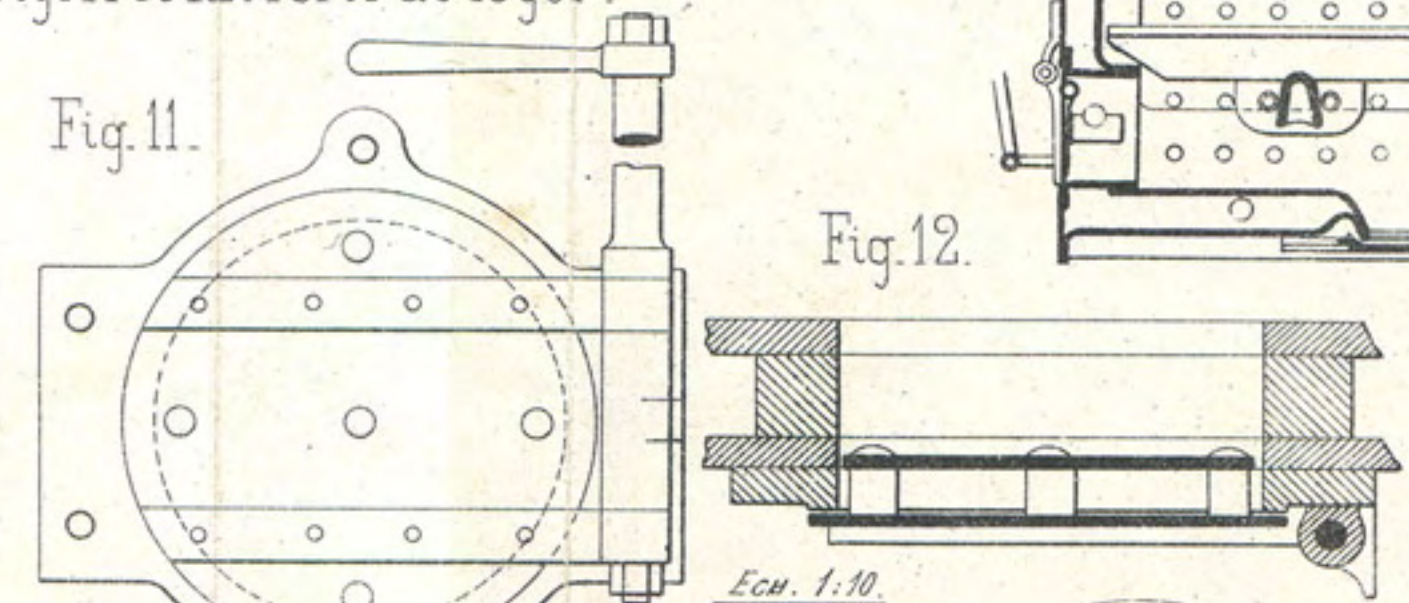


Fig. 13 et 14. Porte du foyer Belpaire.

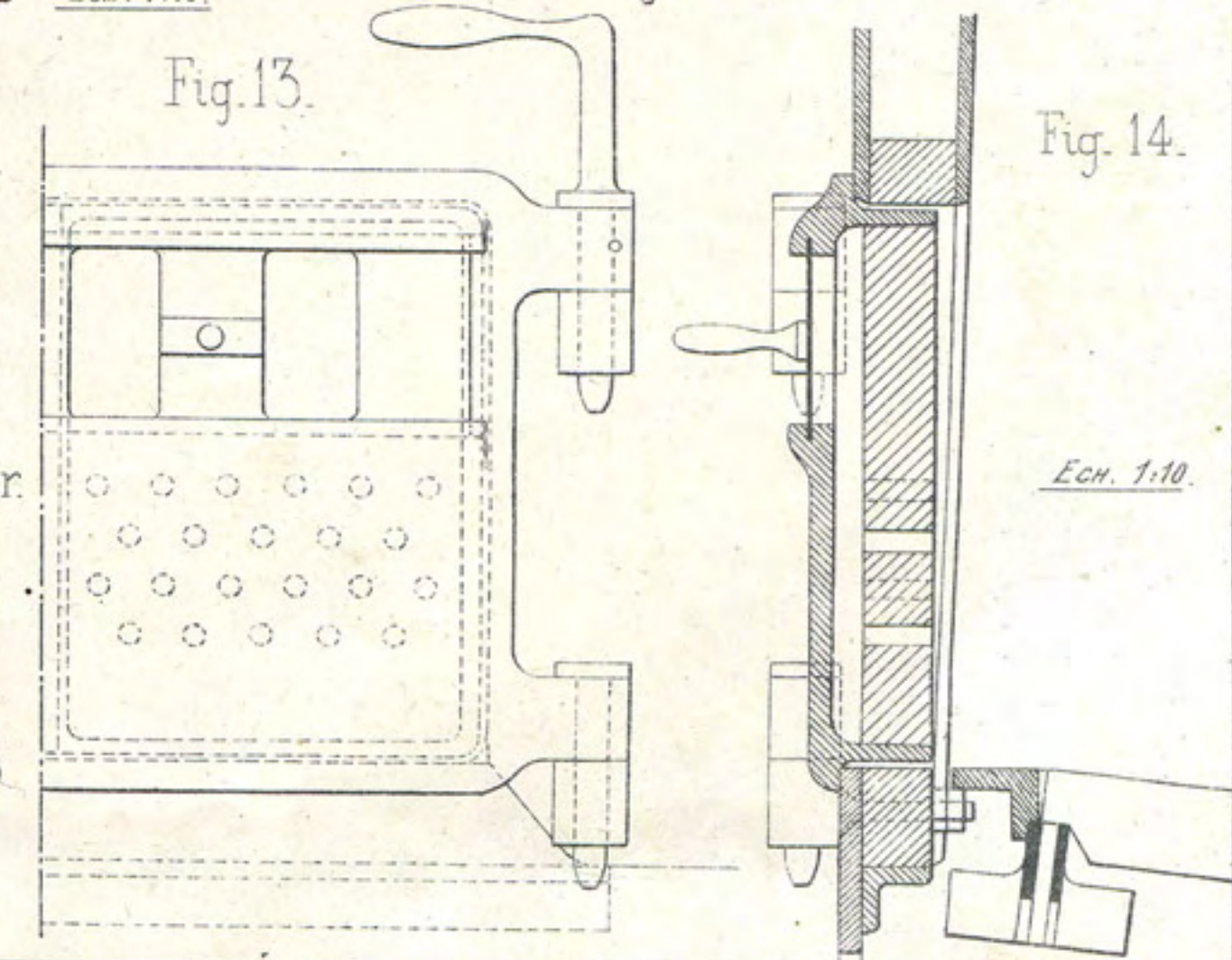


Fig. 15 à 20. Entretoises diverses.

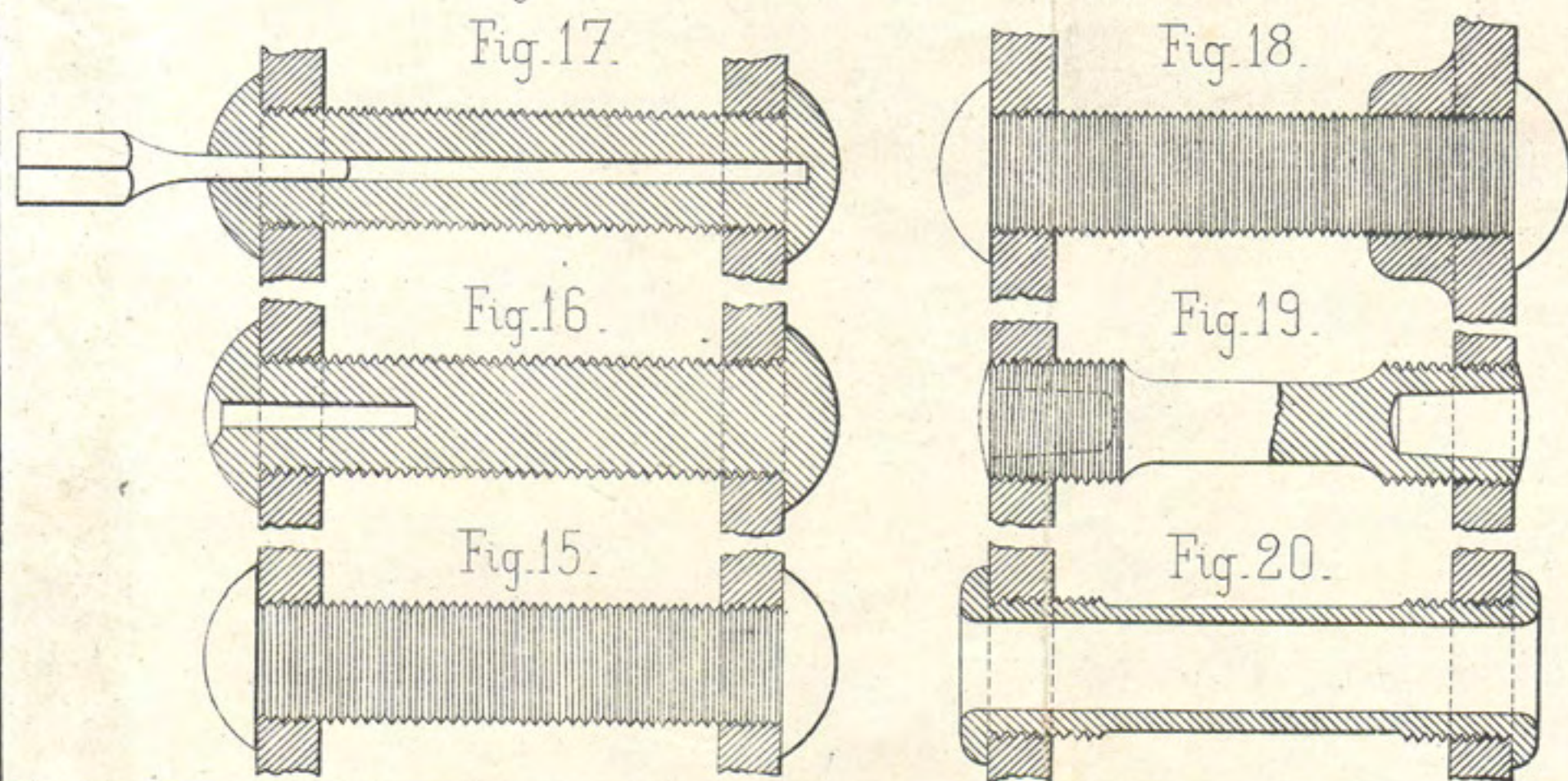


Fig. 21 et 22. Sommier de la locomotive à marchandises du Great Eastern Ry.

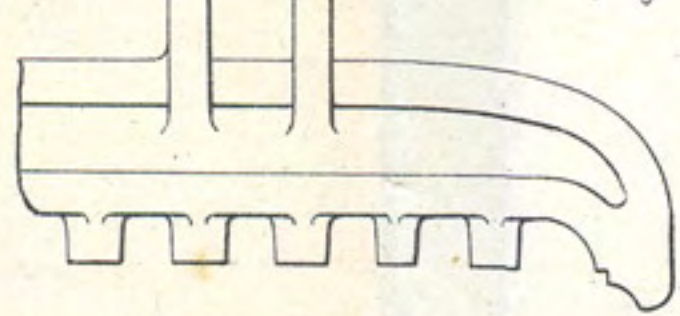


Fig. 23. Sommier longitudinal. Entretoise du Ciel du foyer Belpaire.

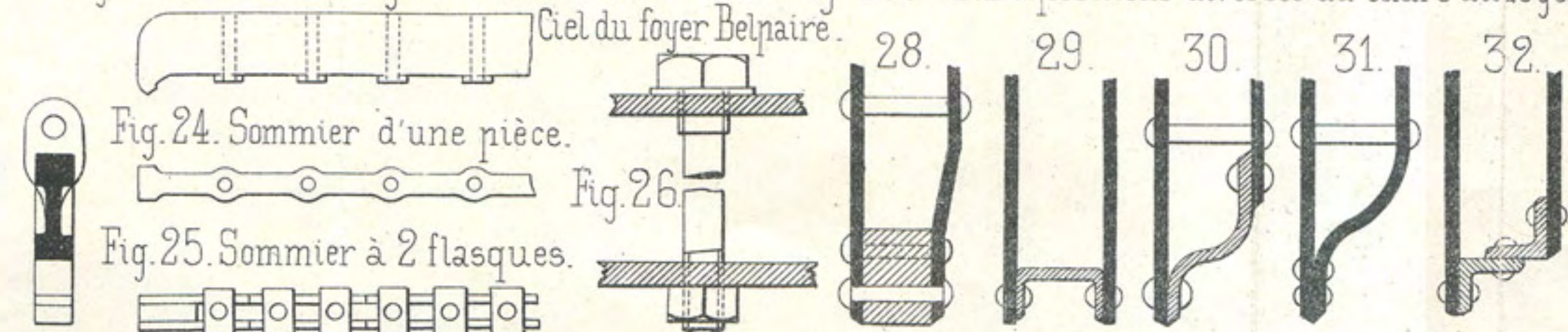
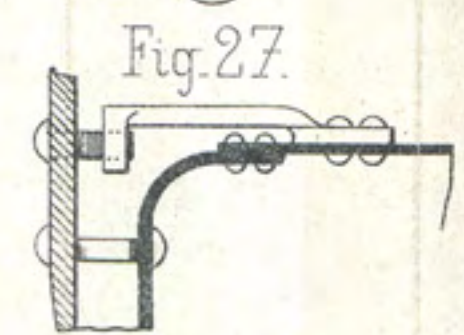
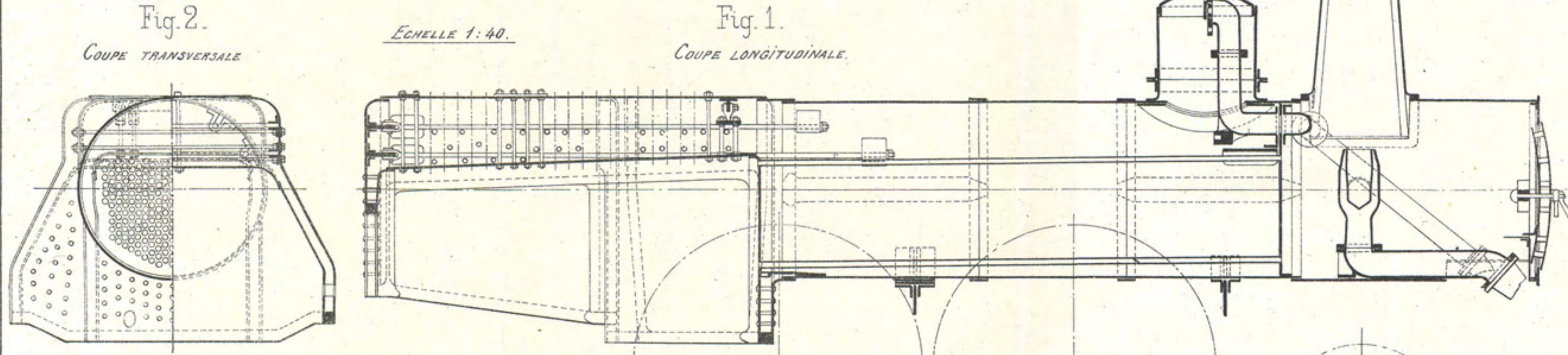


Fig. 27.



Ech. 1:10.

Fig. 1 à 4. Foyer et Chaudière de la locomotive d'express pour lignes de niveau de l'Etat-Belge.



ECHELLE 1:40.

Fig. 8 et 9. Foyer et Chaudière Strong.

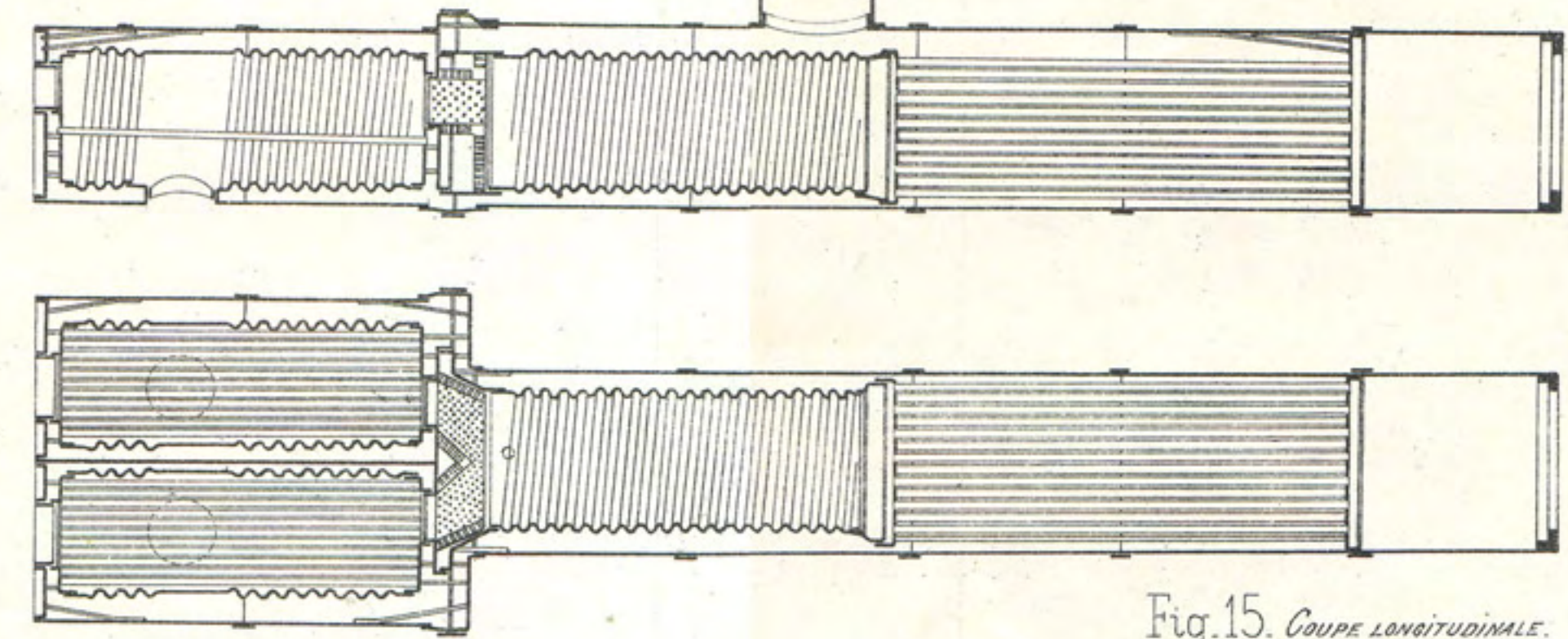


Fig. 20. Voûte à tube d'eau. (Pennsylvania RR).

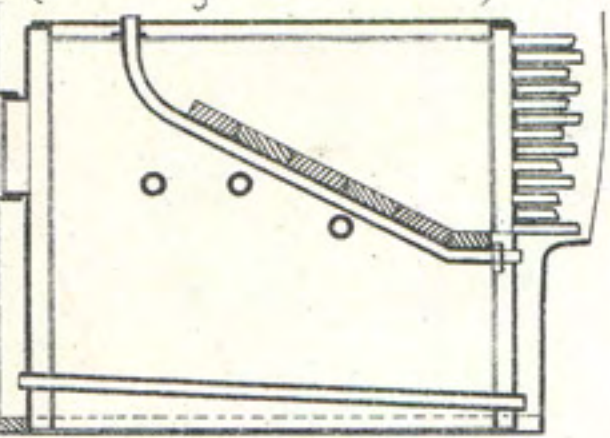


Fig. 15 à 17. Foyer Tilp et Wattitz.

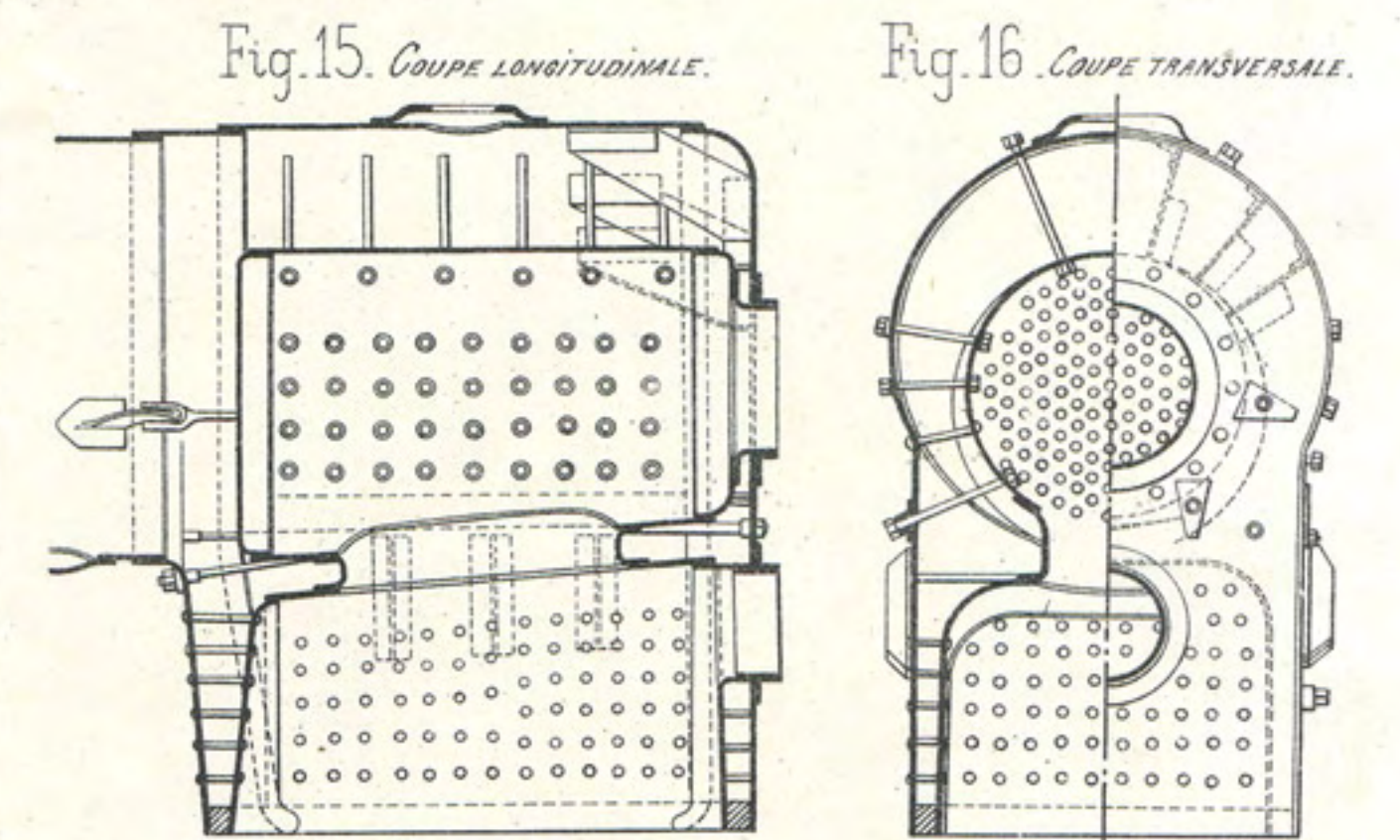


Fig. 10 et 11. Foyer Becker.

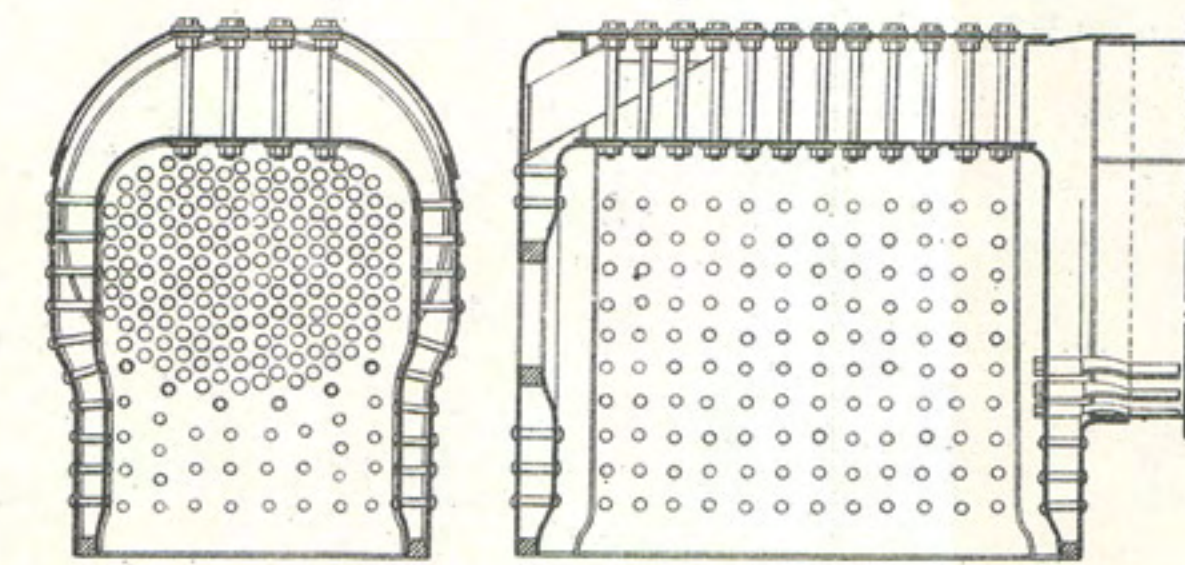
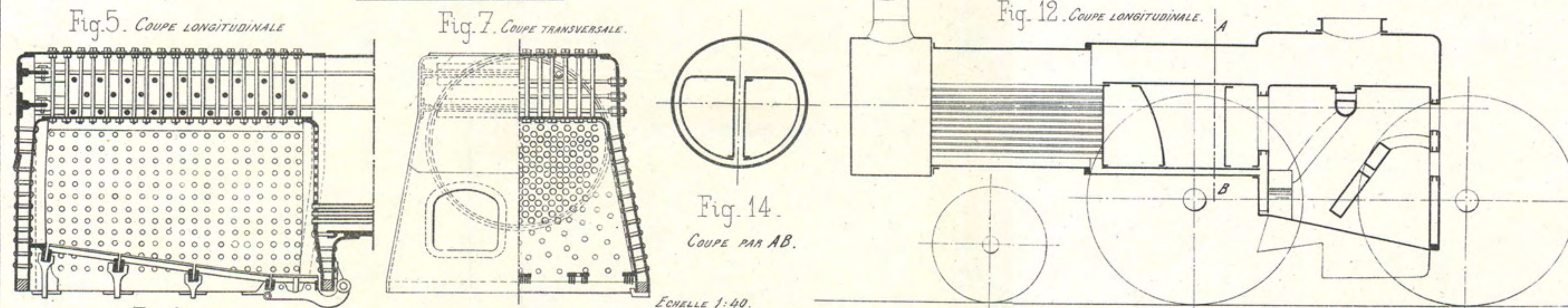


Fig. 12 à 14. Système Beattie. 1855. London et South Western Ry.



ECHELLE 1:40.

Fig. 5 à 7. Foyer des locomotives à 8 roues couplées de l'Etat Belge pour fortes rampes.

Fig. 18. Bouilleur Buchanan.

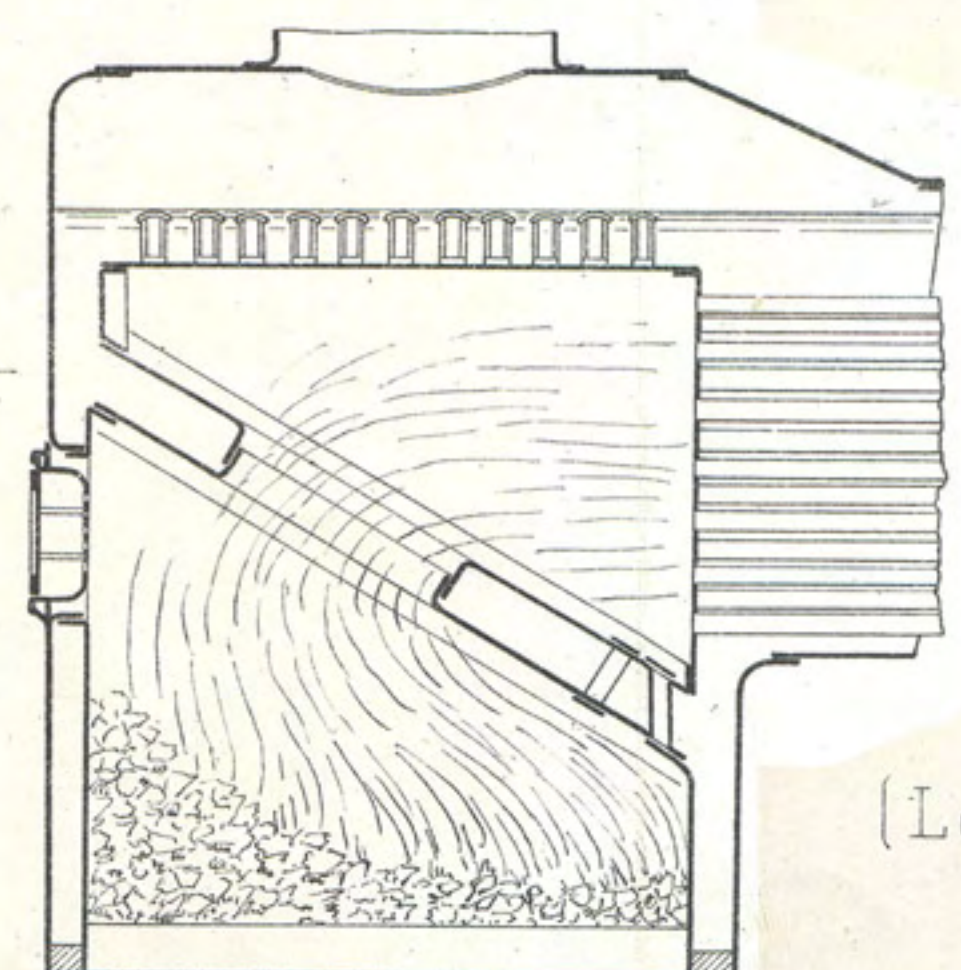
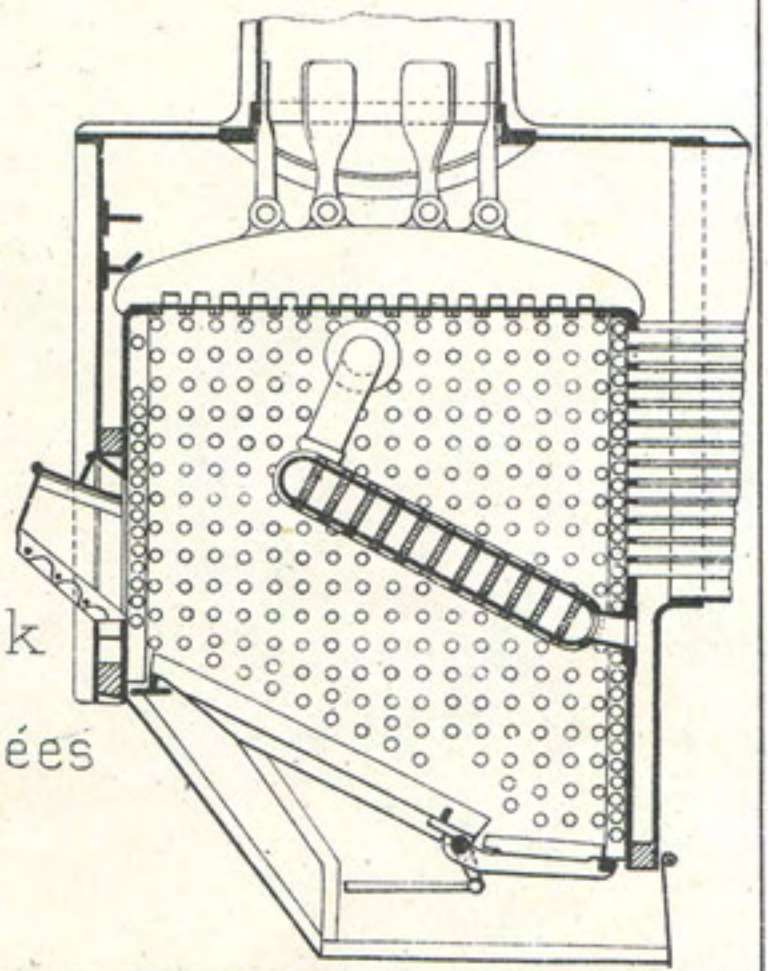


Fig. 19. Foyer Ten Brinck (Locomotive à 6 roues couplées de Paris Orléans).



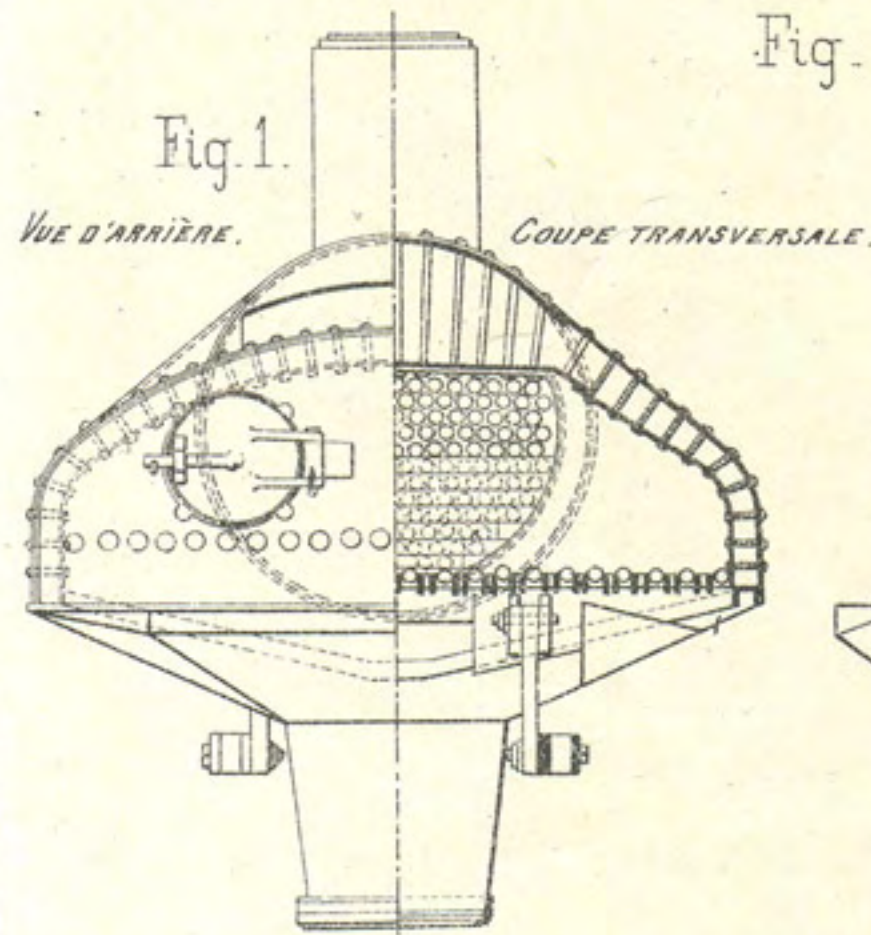


Fig. 1 et 2. Foyer Wootten.

Fig. 2. Coupe longitudinale.

Fig. 3. 1/2 Coupe transversale.

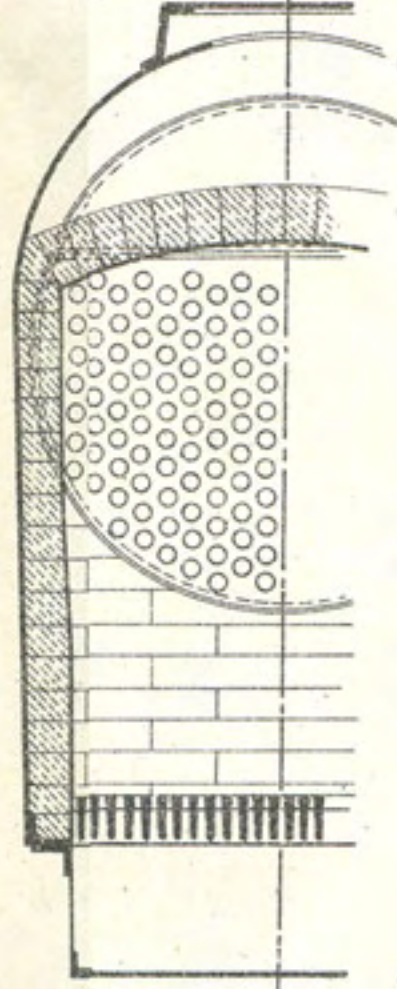


Fig. 3 et 4. Foyer Verderber.

Fig. 4. Coupe longitudinale.

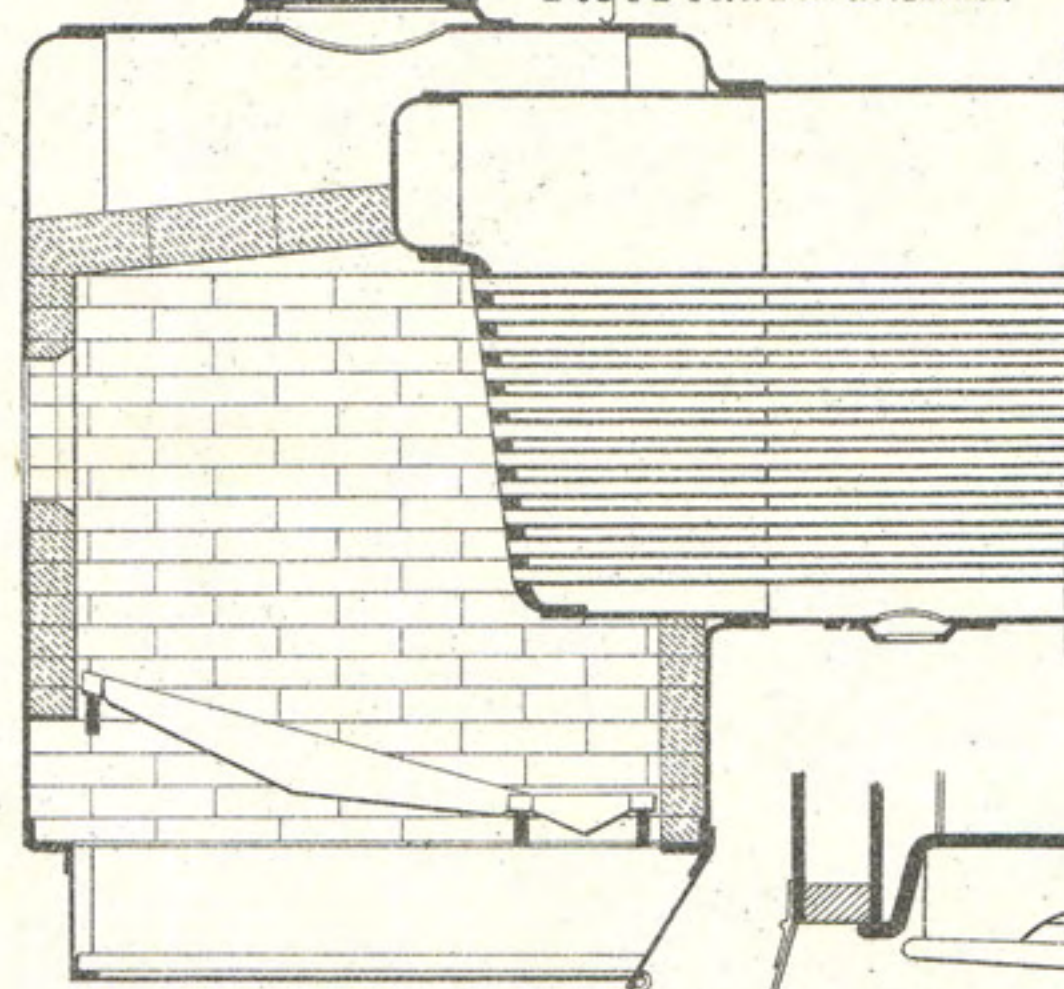


Fig. 5 et 6. Foyer Verderber modifié par Urquhardt.

Fig. 5. Coupe transversale.

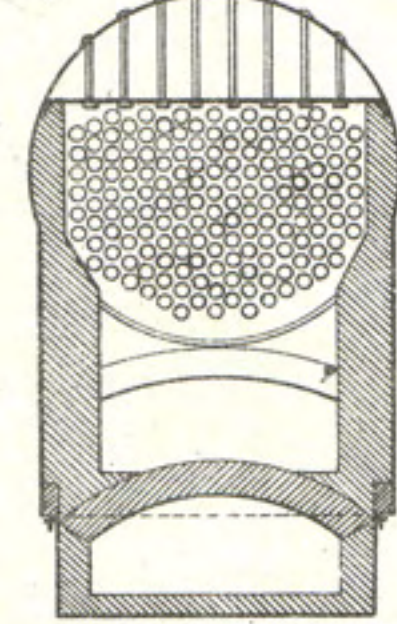


Fig. 6. Coupe longitudinale.

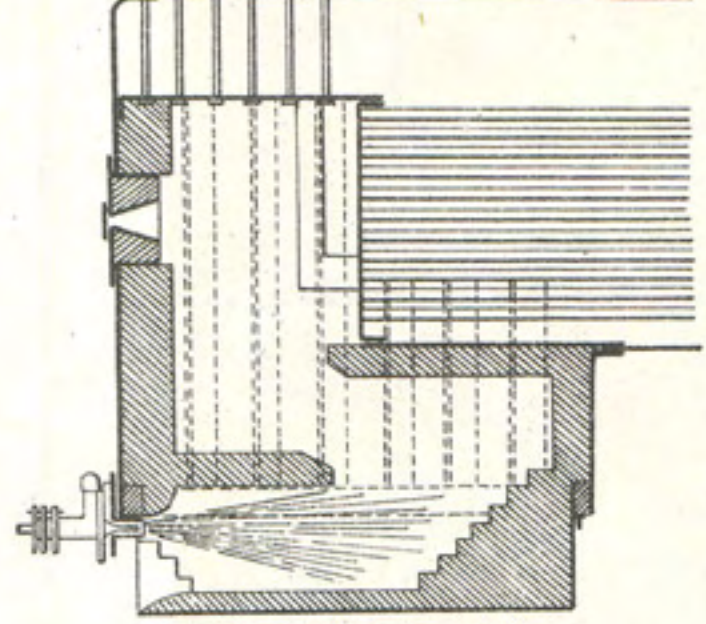


Fig. 7 et 8. Foyer Almgren.

Fig. 7. Coupe longitudinale.

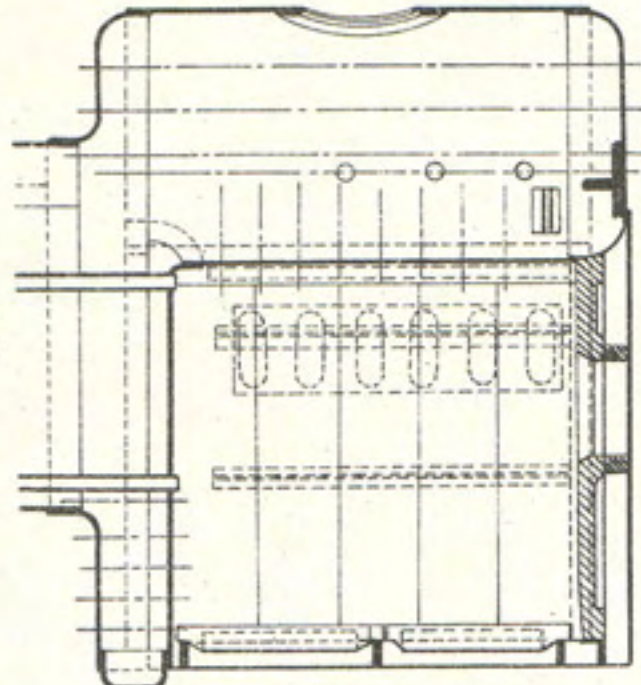


Fig. 8. 1/2 Coupe. 1/2 Vue.

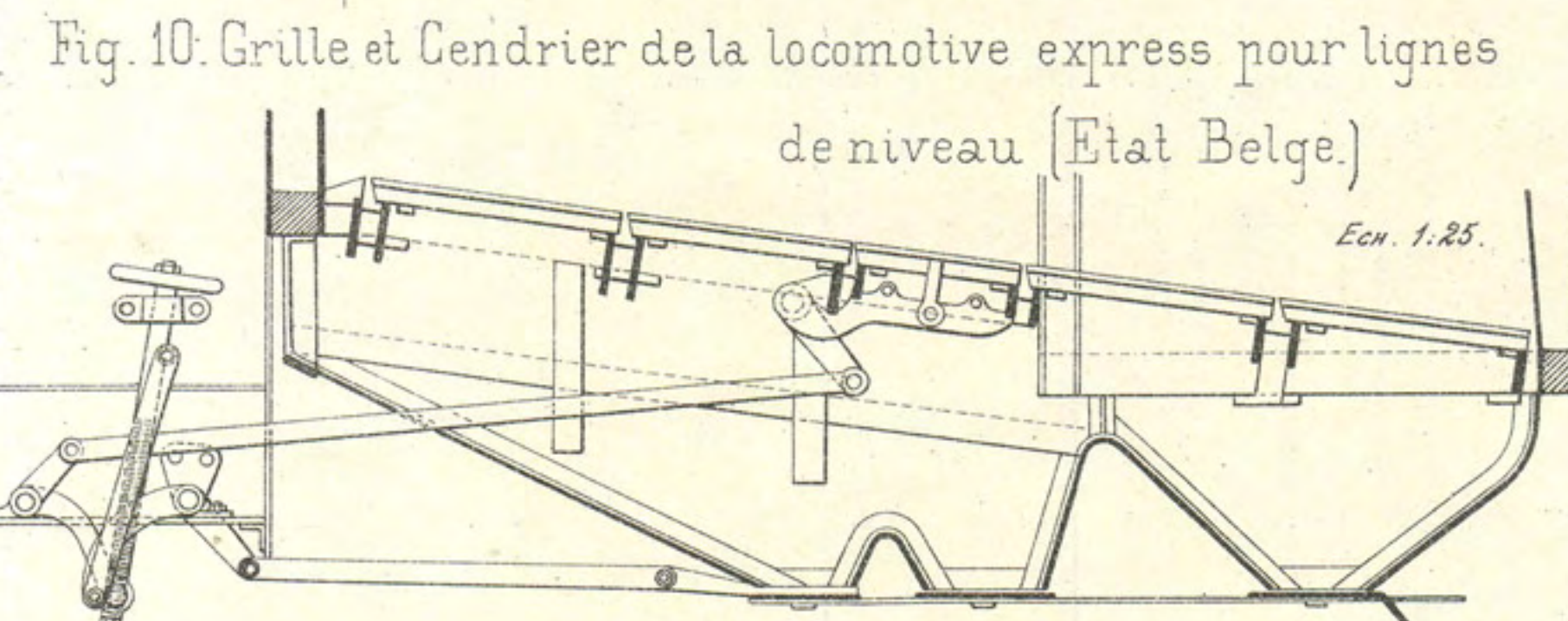
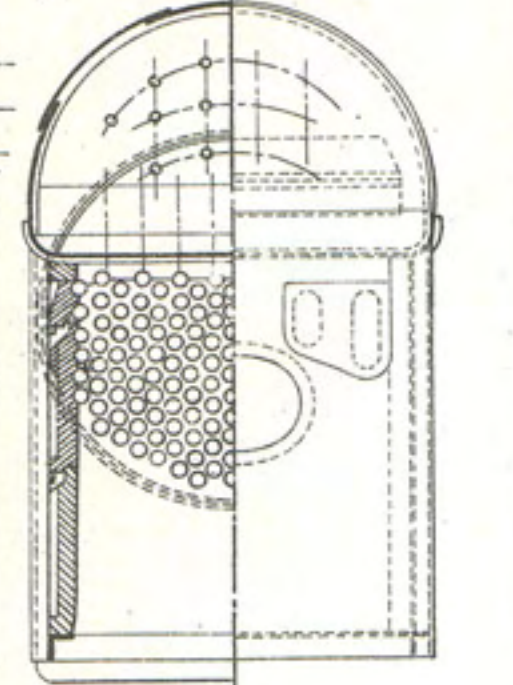


Fig. 10. Grille et Cendrier de la locomotive express pour lignes de niveau (Etat Belge.)

Ech. 1:25.

Fig. 11 et 12.

Etat Belge. Paquet de grilles pour le charbon menu.

Fig. 11. Coupe transv.

Fig. 12. Elevation.

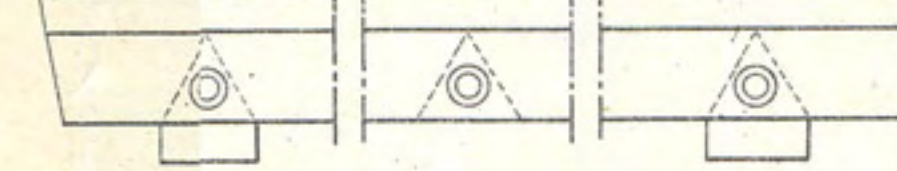


Fig. 13 et 14. Grille à secousses.

Fig. 13. Coupe.

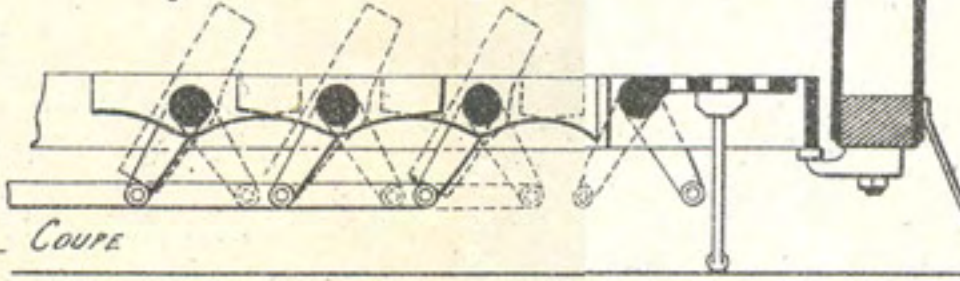


Fig. 14. Plan.

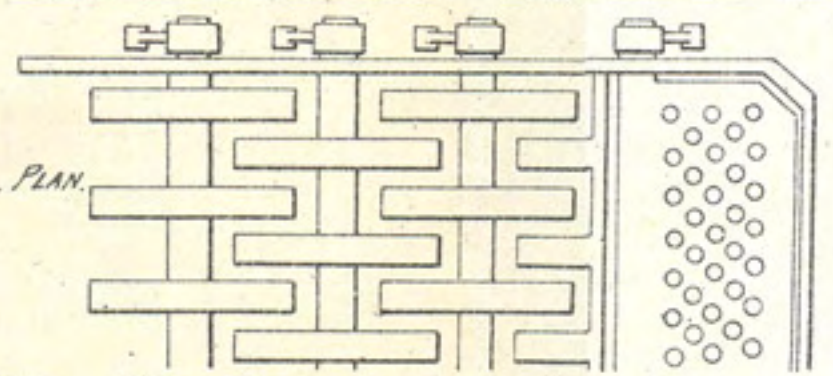


Fig. 18. Coupe.

Fig. 17. Grille à tubes d'eau.

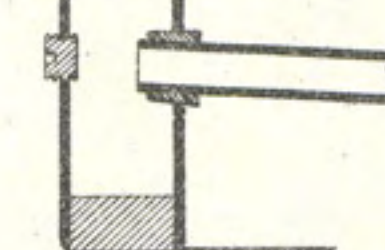


Fig. 19. Plan.

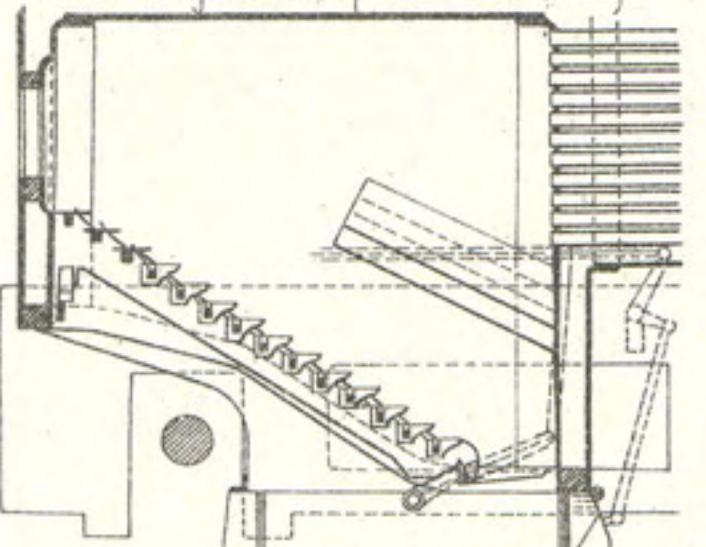


Fig. 20. Foyer Cudworth à grille inclinée (South-Eastern Ry).

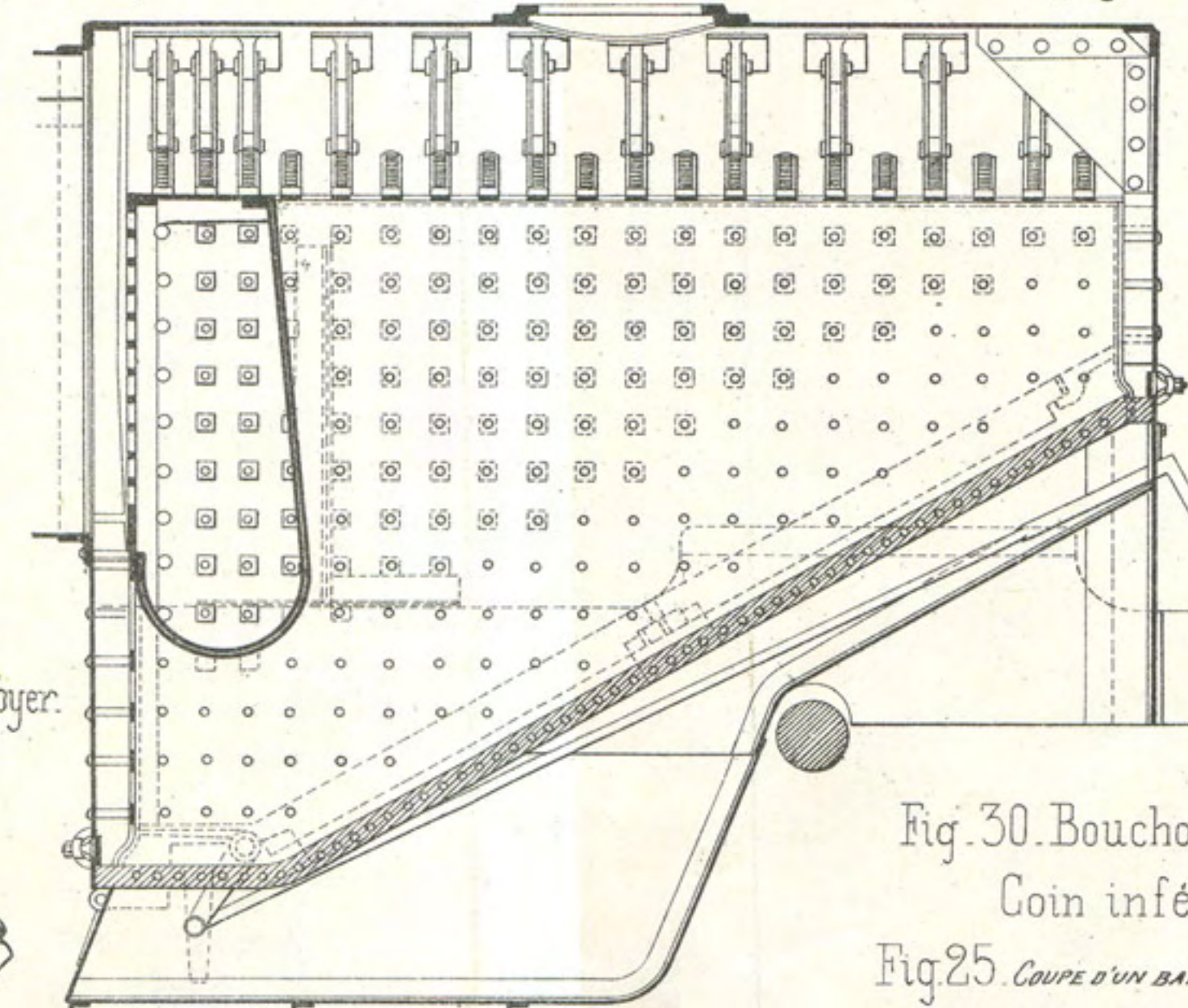


Fig. 24 et 25. Grille à courant d'air de Hill.

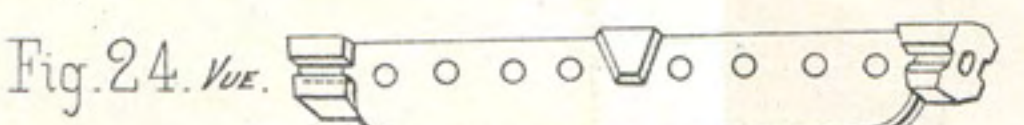


Fig. 25. Coupe d'un barreau.

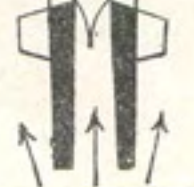


Fig. 21 à 23. Grille à barreaux en fonte Loc. Vulcan.

Fig. 21. Coupe longitudinale.

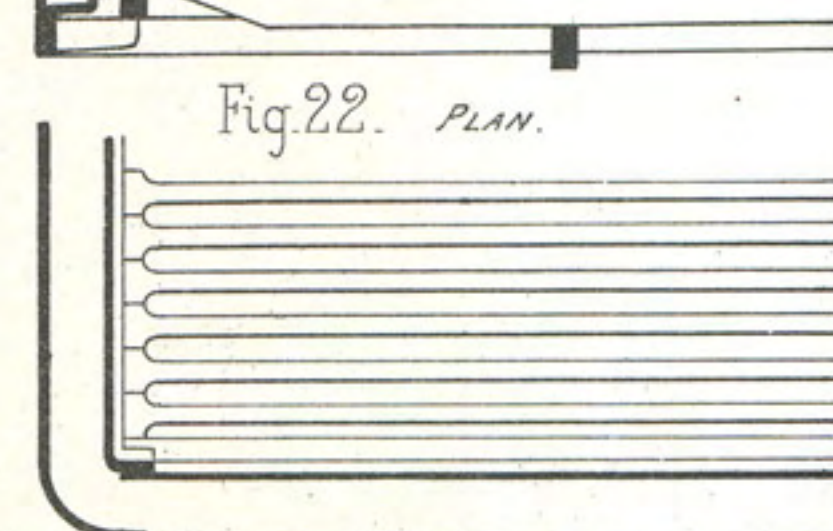


Fig. 22. Plan.

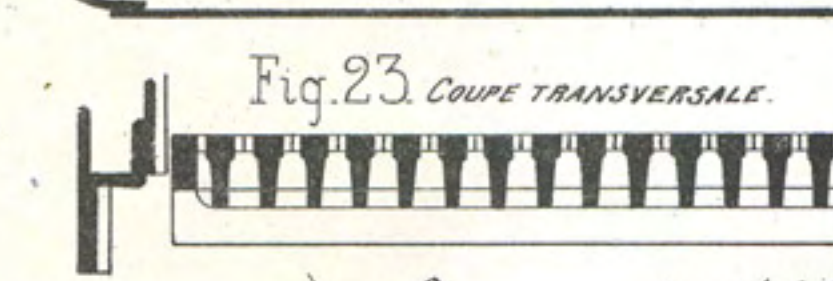
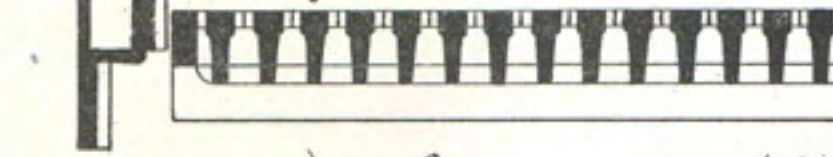


Fig. 23. Coupe transversale.



Ech. 1:25.

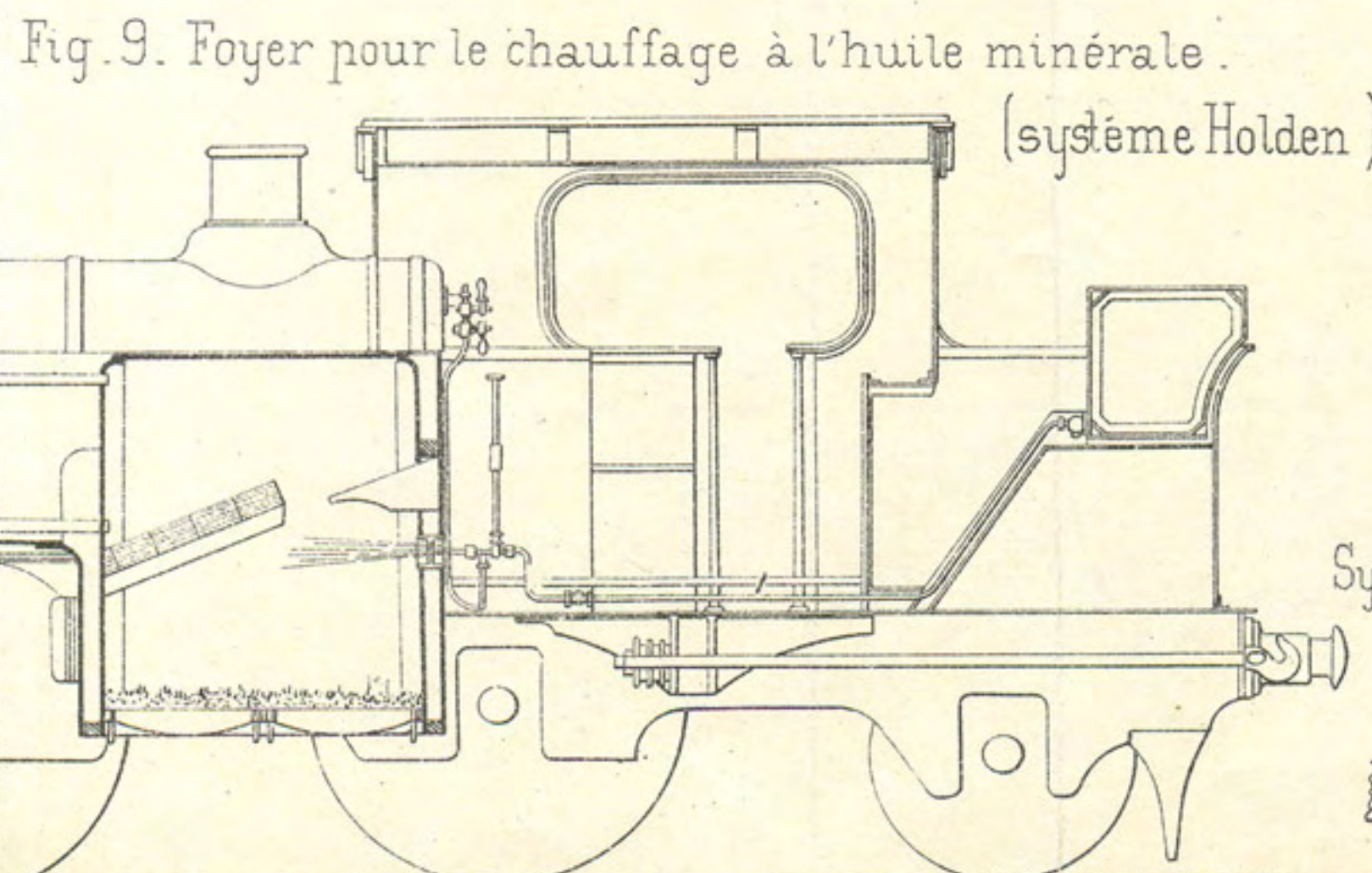


Fig. 9. Foyer pour le chauffage à l'huile minérale (système Holden)

Fig. 26 à 28. Bouchons fusibles.

Fig. 26. Système Adams.

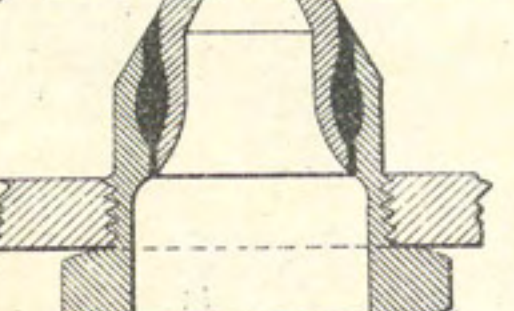


Fig. 27. Système Hiller.

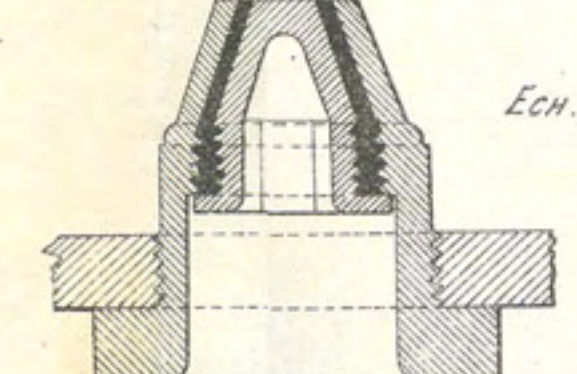
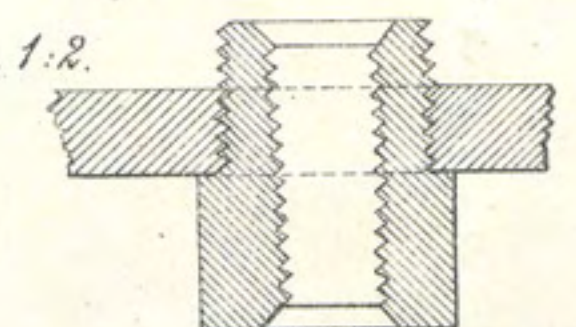


Fig. 28. Etat Belge.



Ech. 1:2.

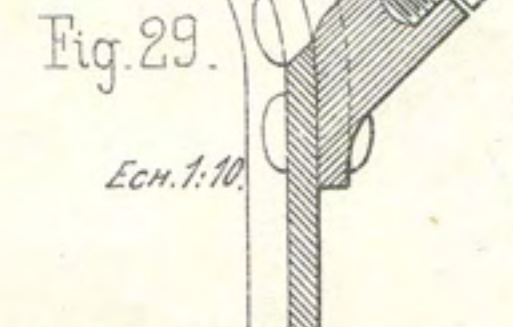
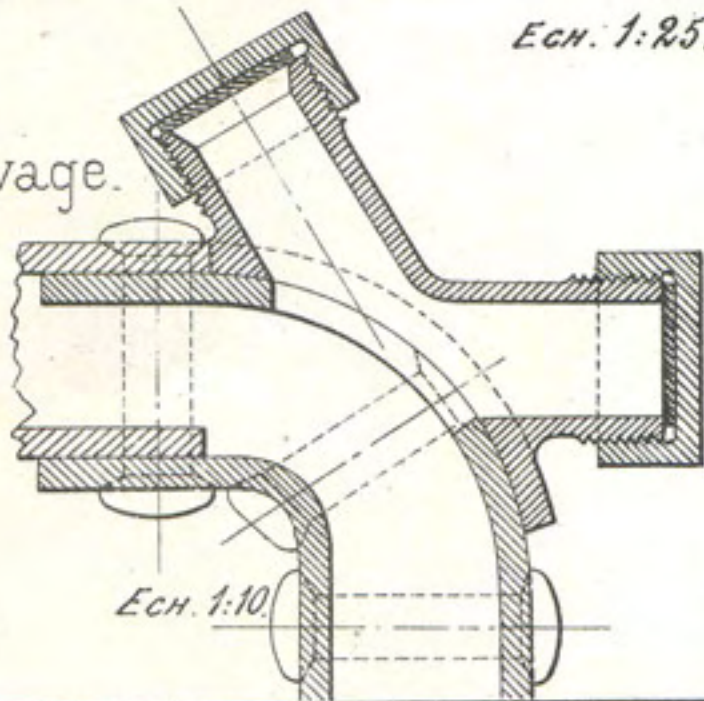


Fig. 29.

Ech. 1:10.

Fig. 30. Bouchon de lavage. Coin inférieur.



Ech. 1:10.

Fig. 1 et 2. Boîte à fumée de la locomotive à marchandises pour fortes rampes de l'Etat Belge.

Fig. 3 et 4. Boîte à fumée de la locomotive à marchandises de l'Etat Belge.

Fig. 5 à 10. Divers types de cheminées. Ech. 1:30.

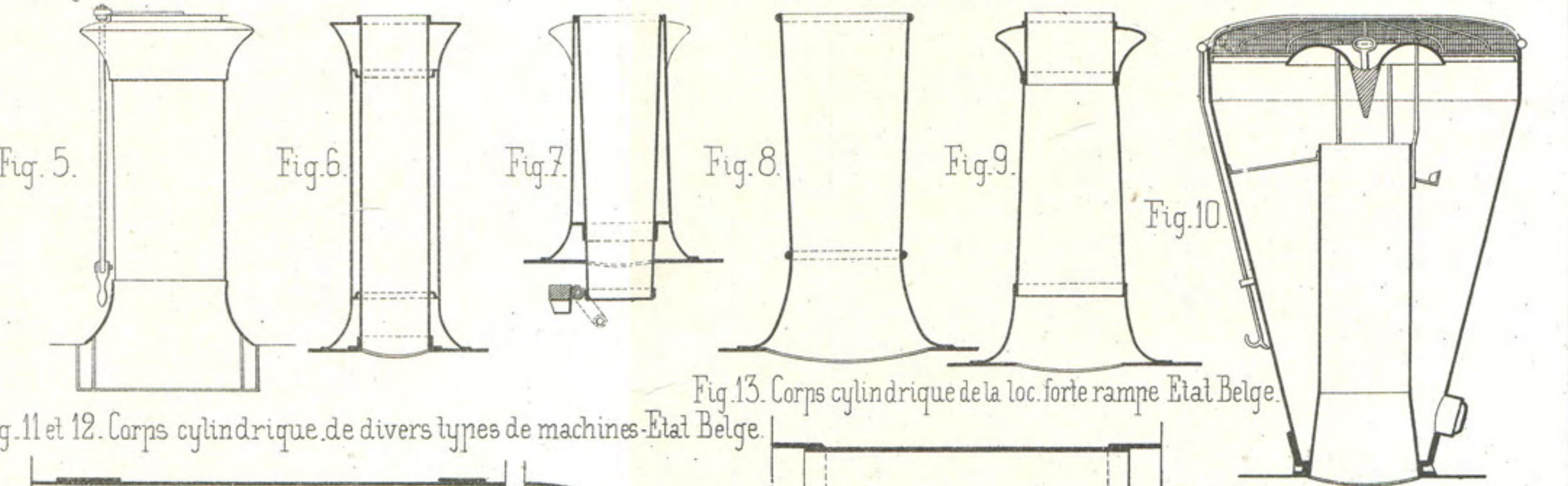
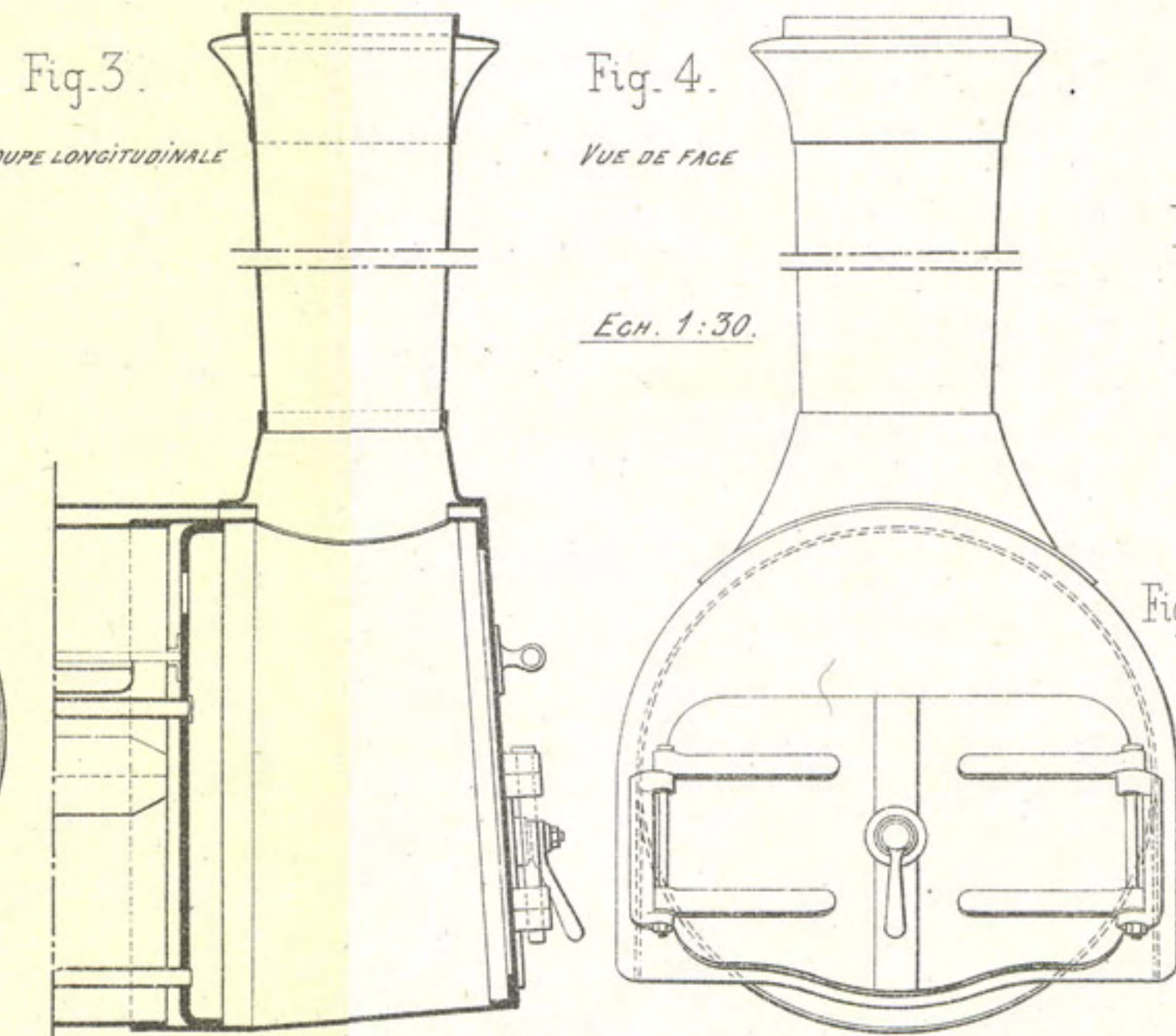
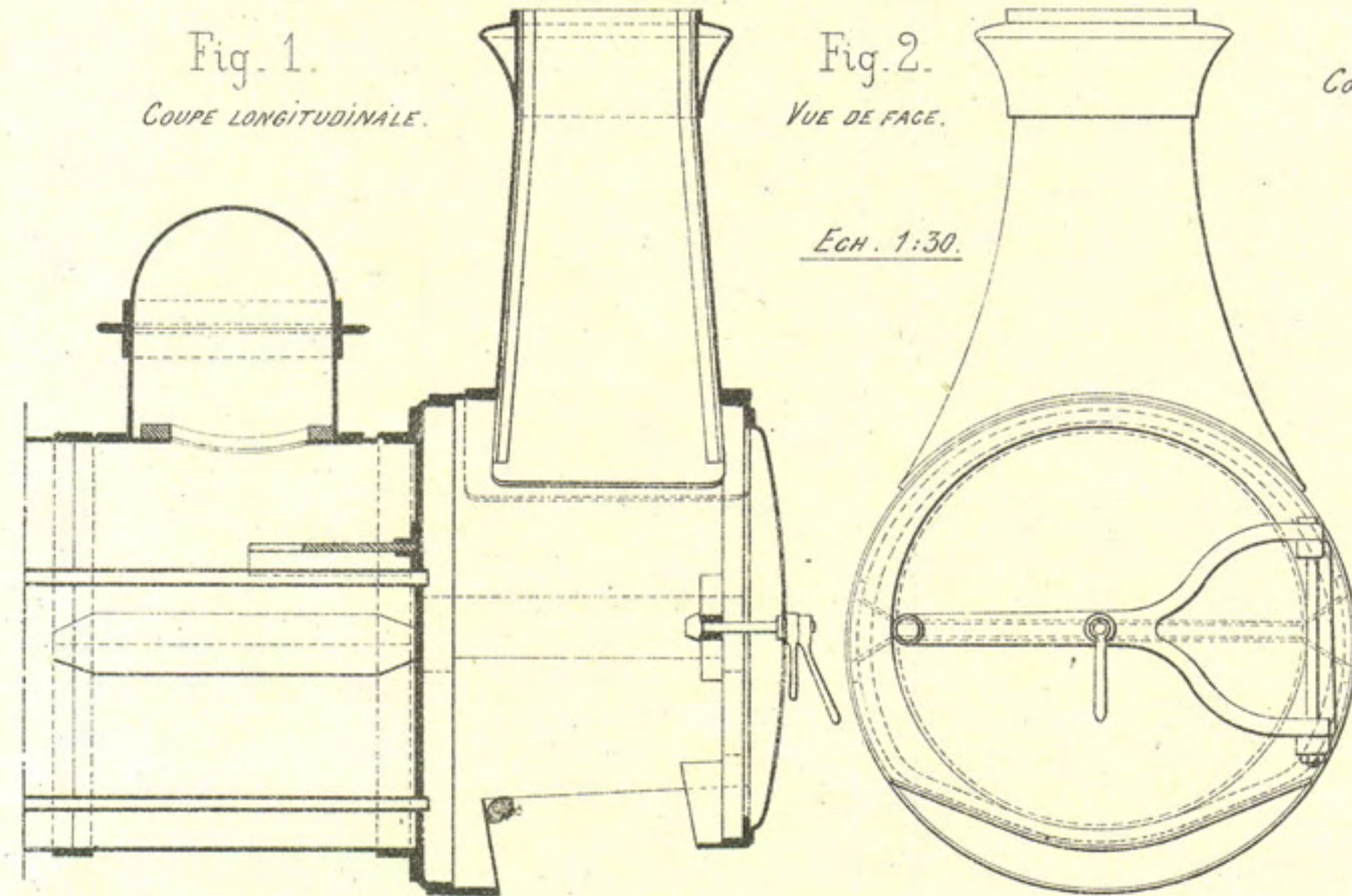


Fig. 11 et 12. Corps cylindrique de divers types de machines Etat Belge.

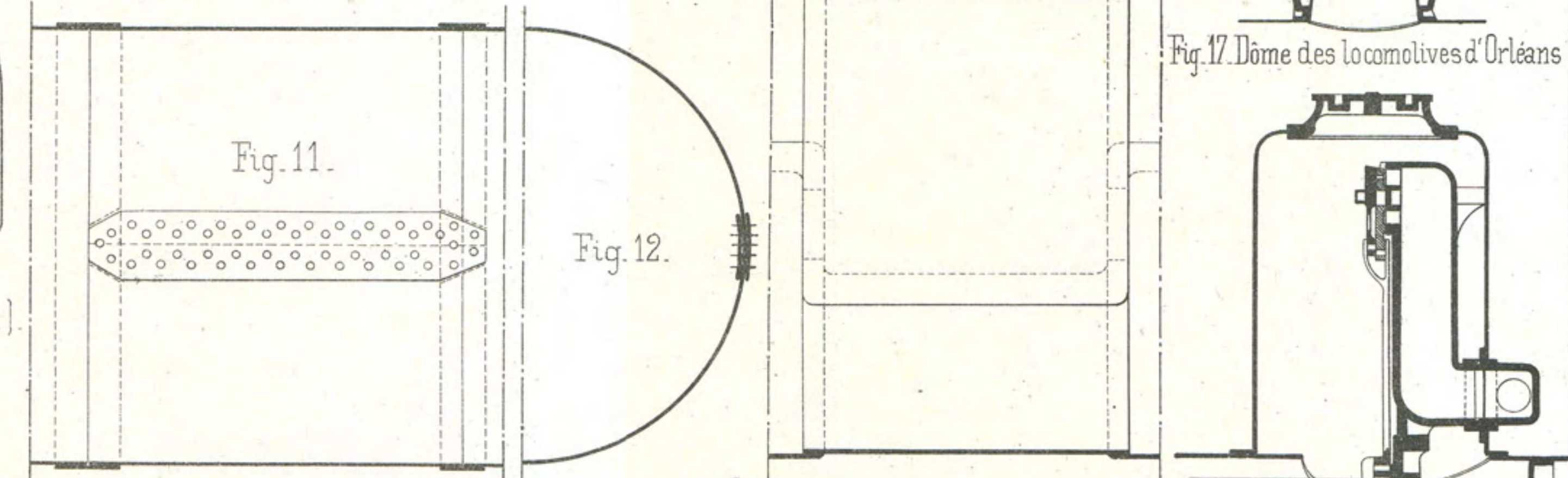


Fig. 13. Corps cylindrique de la loc. forte rampe Etat Belge.

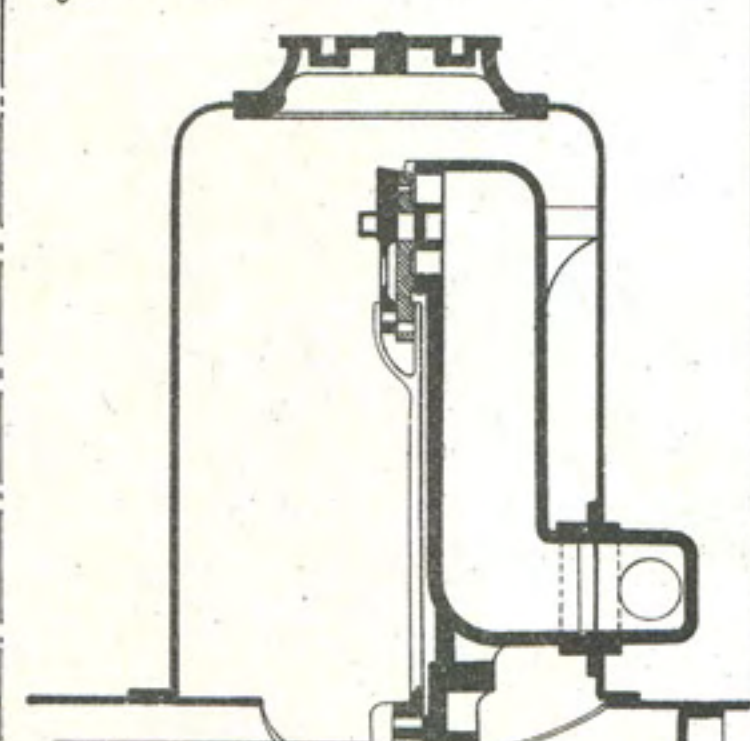


Fig. 17. Dôme des locomotives d'Orléans

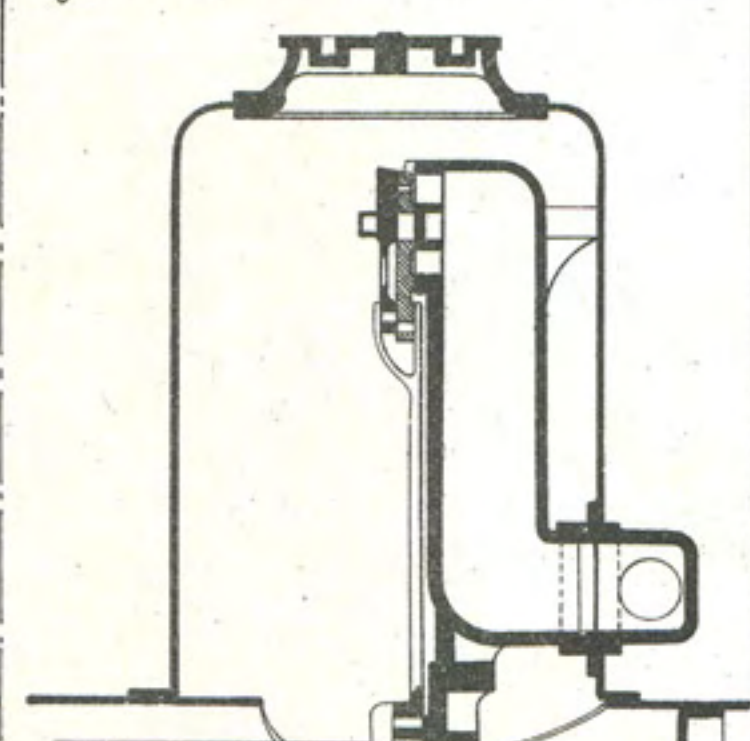


Fig. 24 à 30. Dispositions diverses de tubes à fumée.

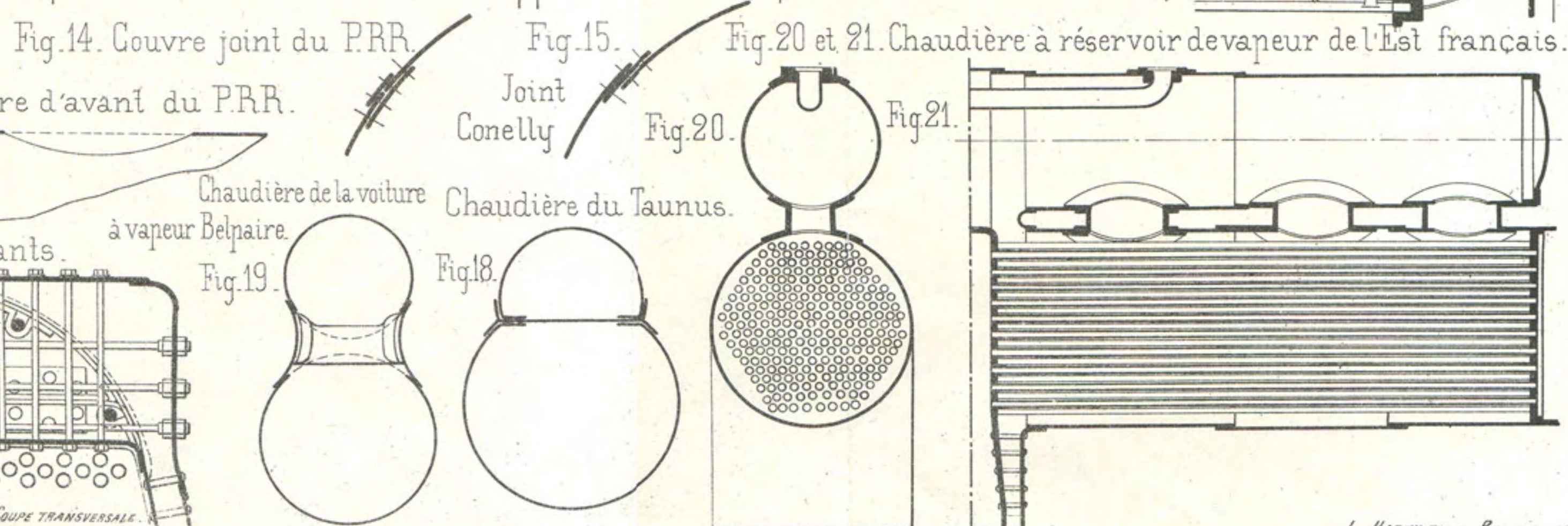
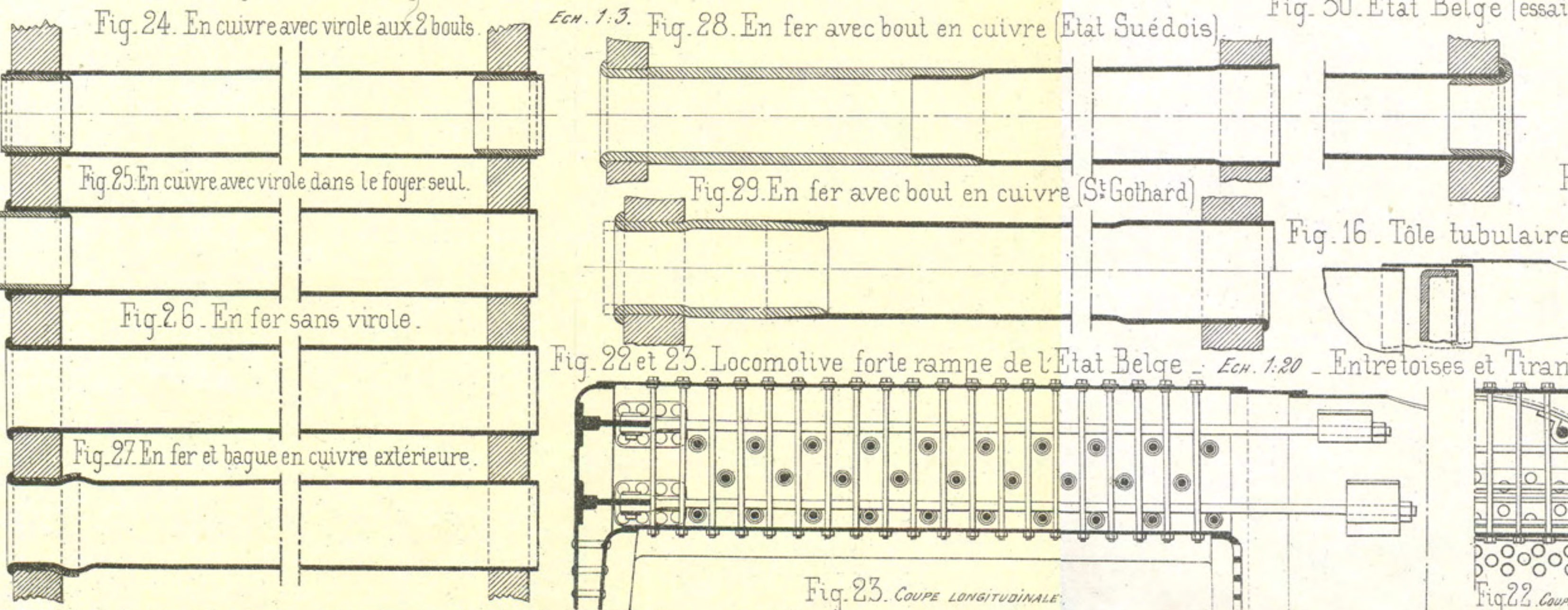


Fig. 1. Pompe alimentaire du Ch. de fer de Rouen.

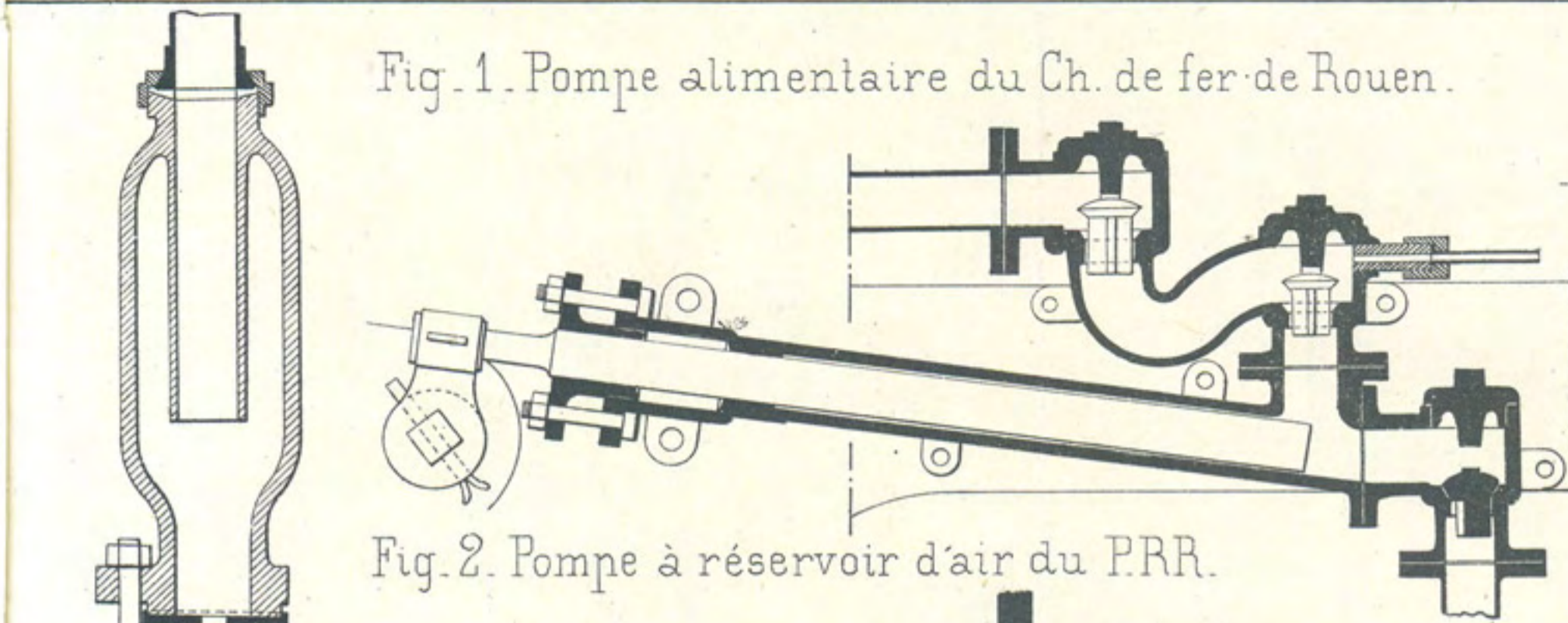


Fig. 2. Pompe à réservoir d'air du P.R.R.

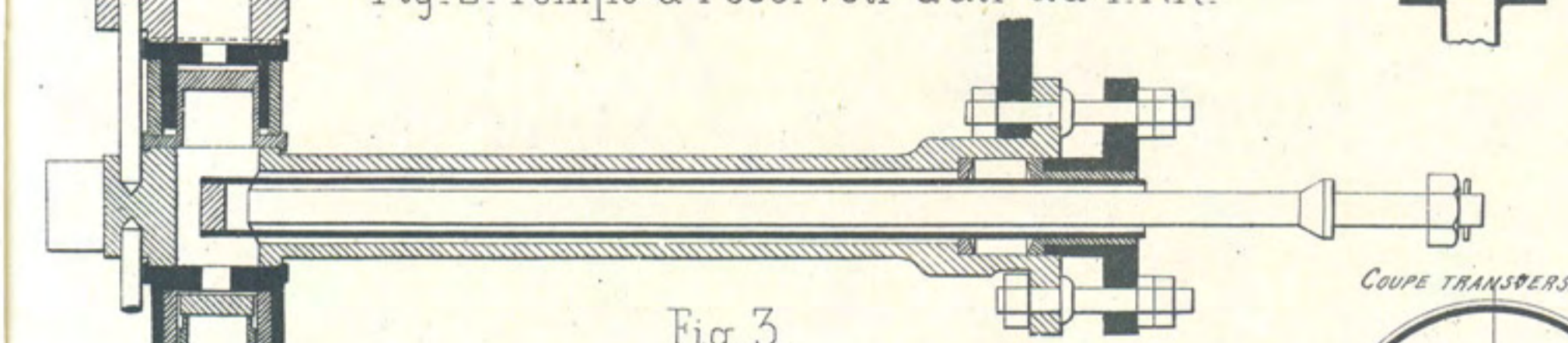
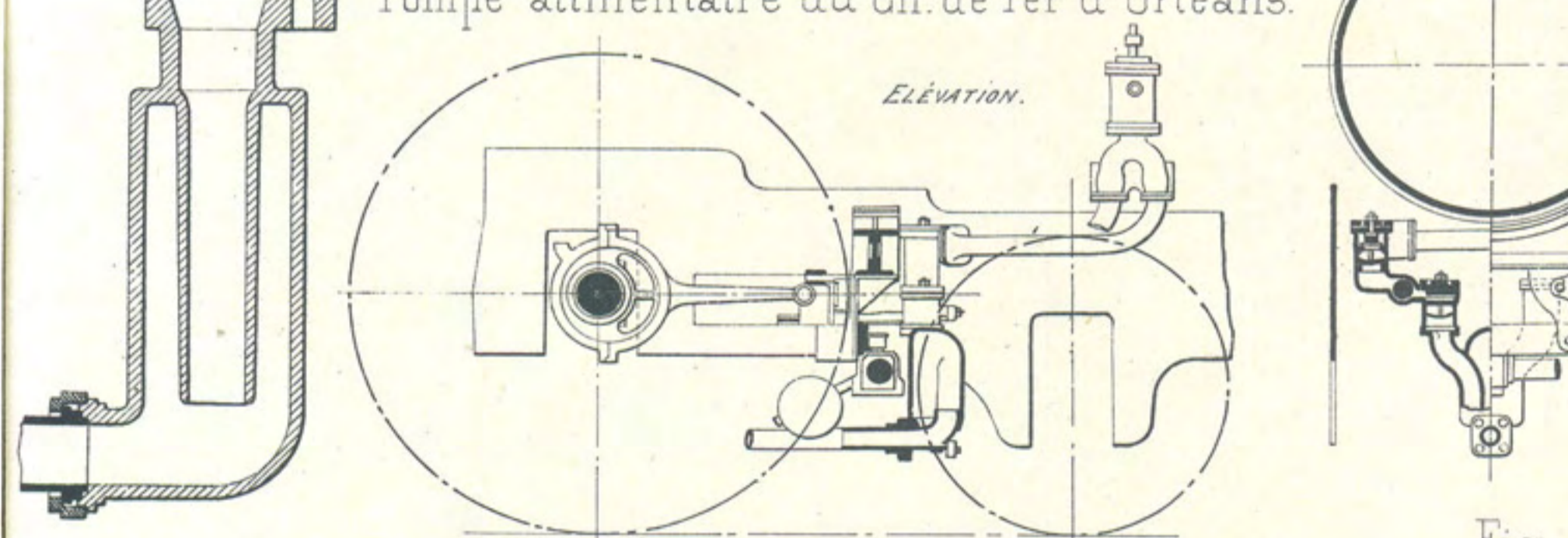


Fig. 3. Pompe alimentaire du Ch. de fer d'Orléans.



COUPE TRANSVERSALE.

ÉLÉVATION.

Fig. 6 à 8. Injecteur Friedman.

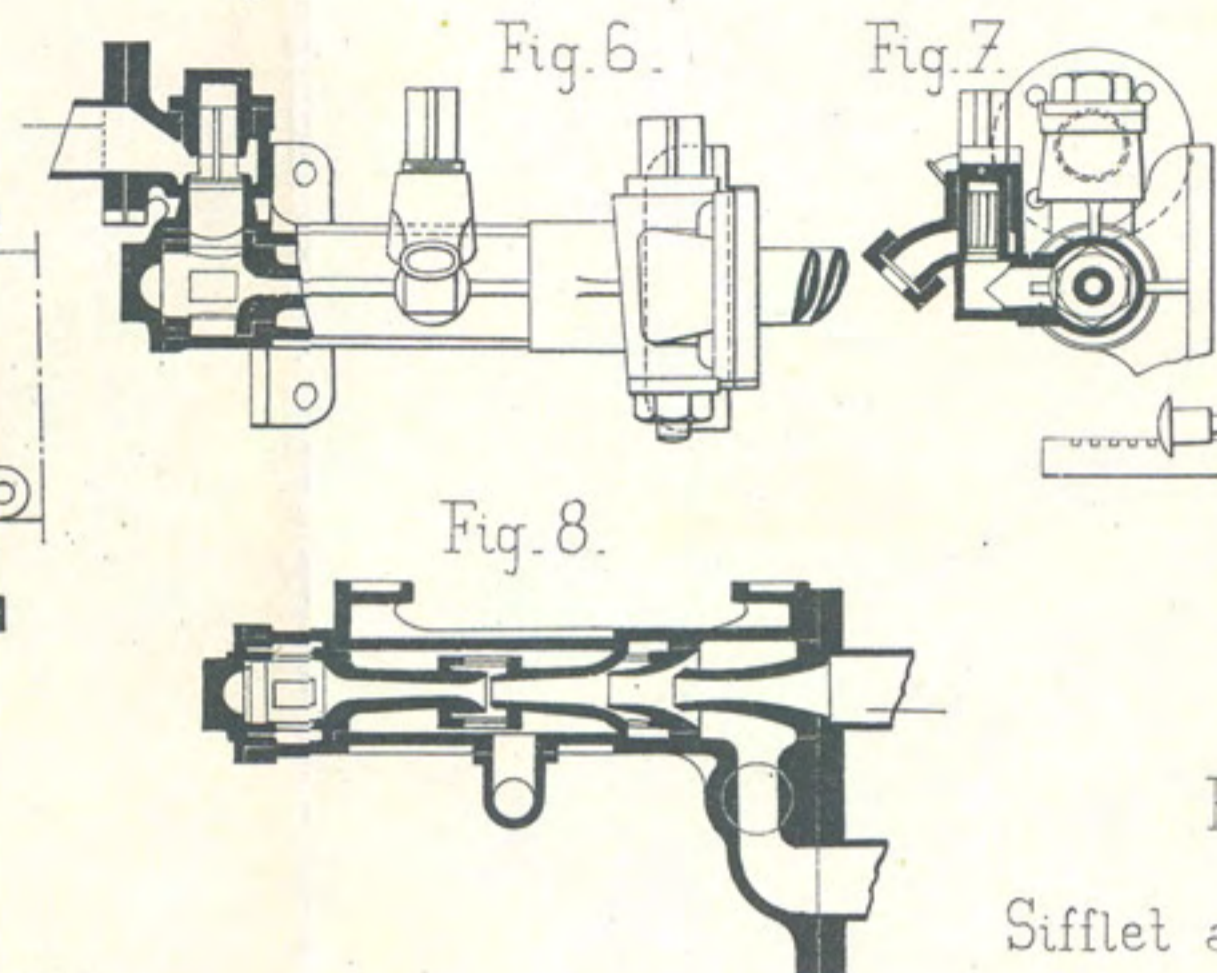


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9. Injecteur aspirant de Sellers.

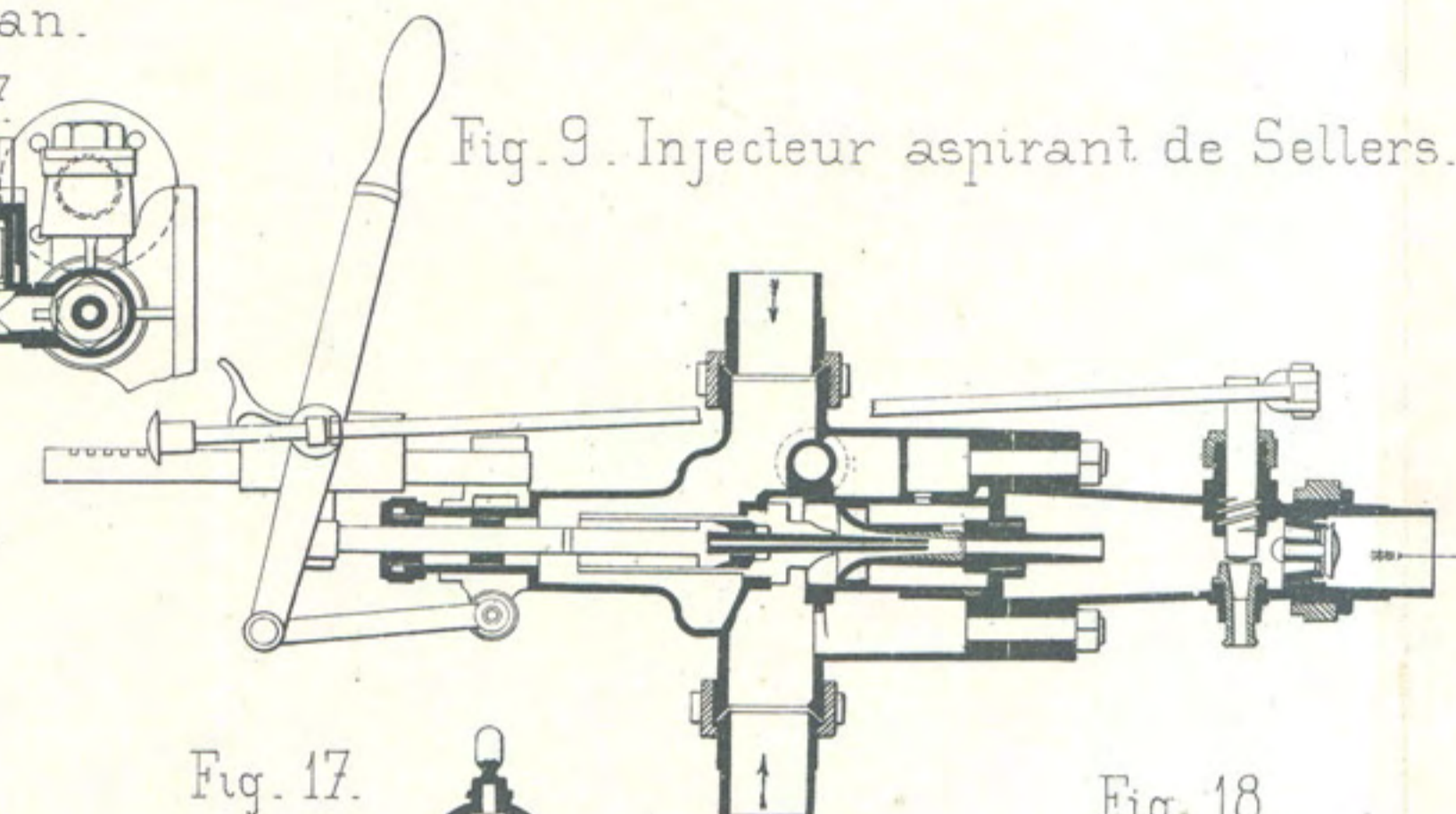


Fig. 17.

Sifflet anglais.

Fig. 18.

Sifflet de la loc. de l'Etat-Belge.

GRANDE VITESSE.

Fig. 10 et 11. Injecteur de Webb.

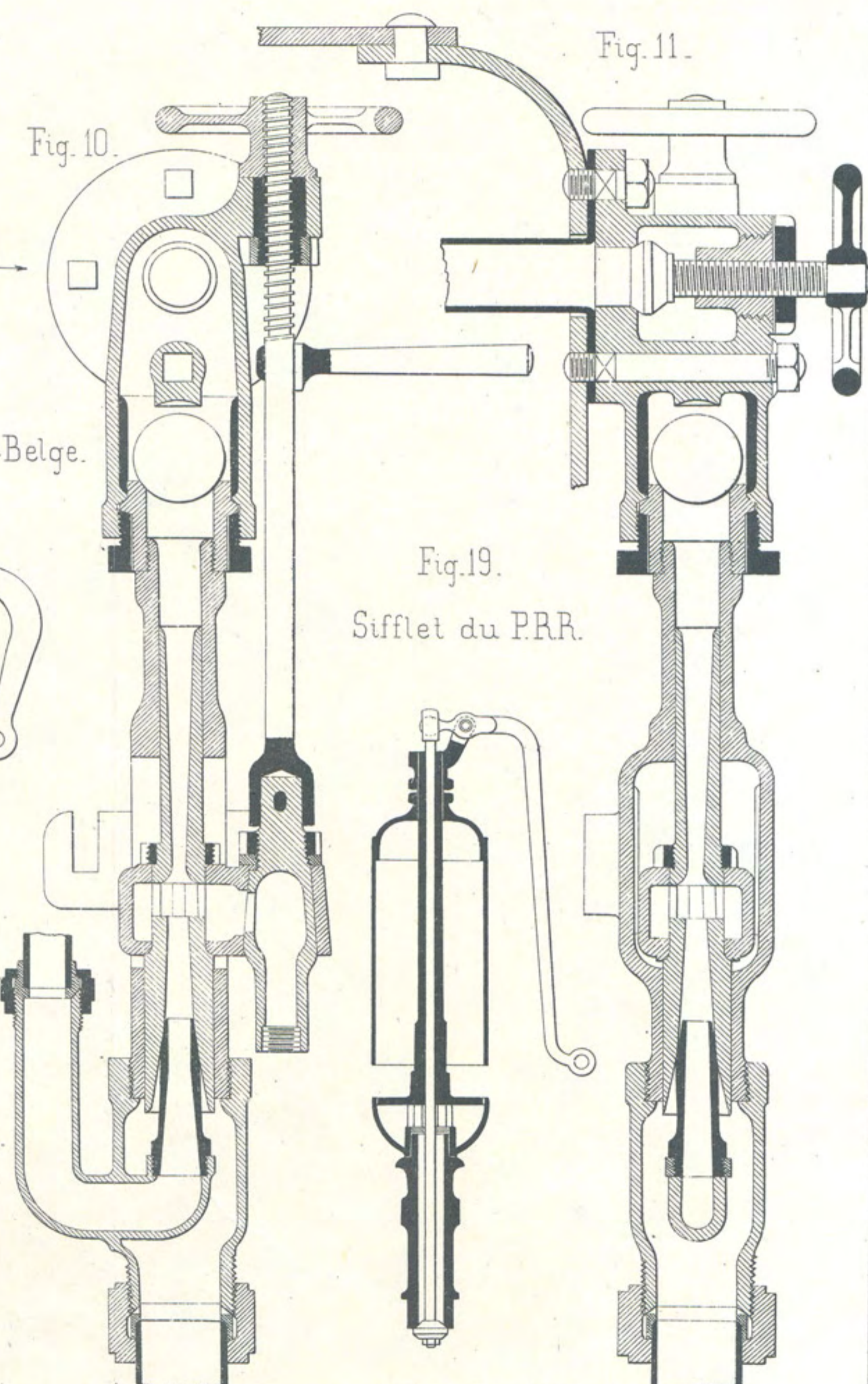


Fig. 10.

Fig. 11.

Fig. 19.

Sifflet du P.R.R.

Fig. 13 et 14. Pompe injecteur Chiazzari.

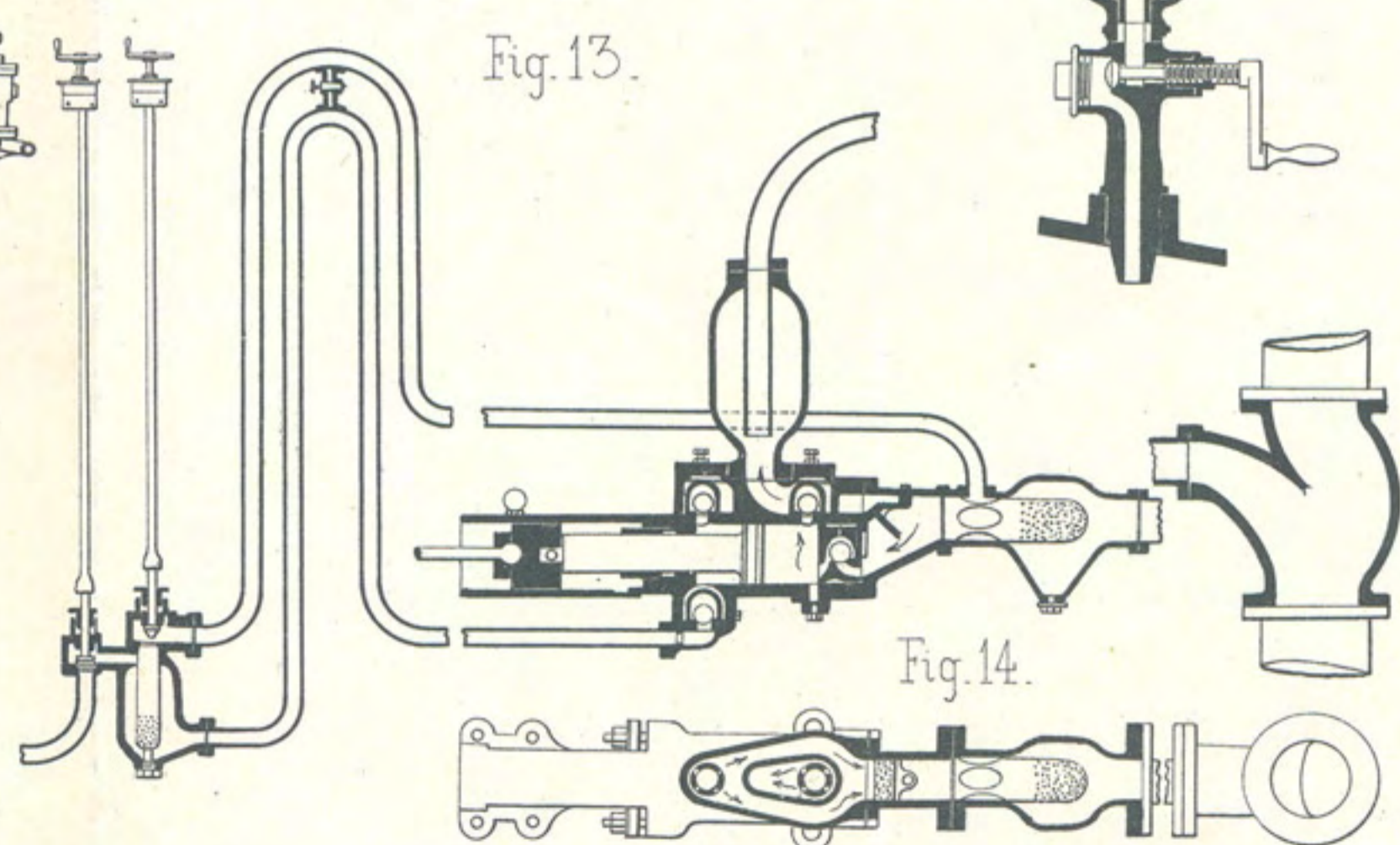


Fig. 13.

Fig. 14.

Fig. 5. Injecteur Giffard de Flaud.

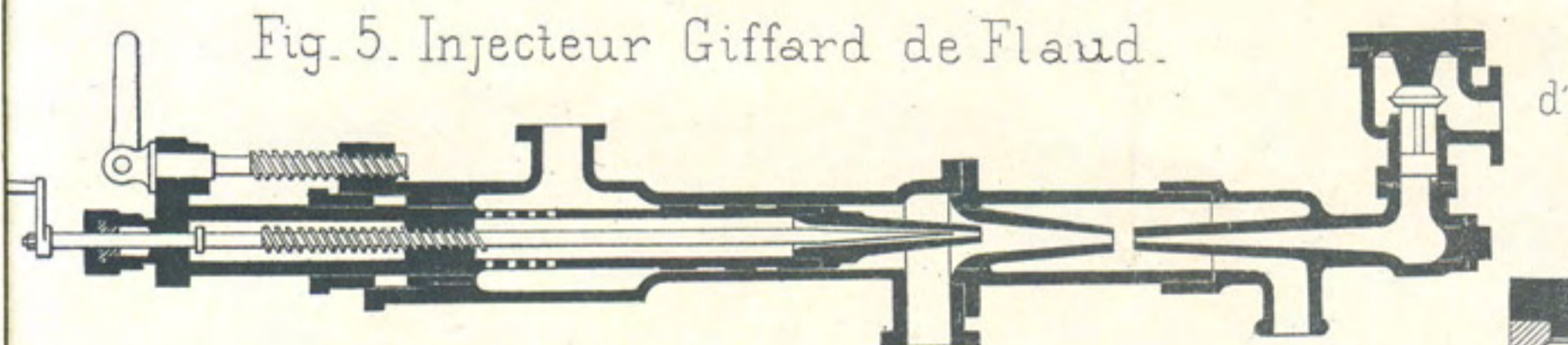


Fig. 4. Robinet d'introduction

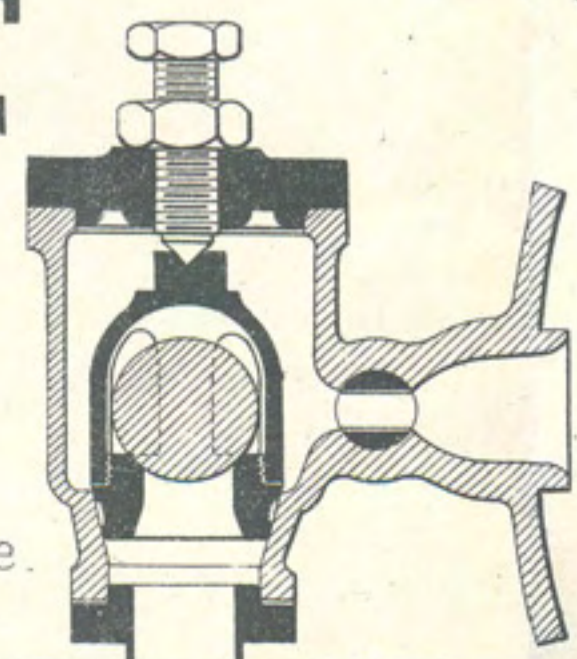


Fig. 16. Raccord au tender du Nord français.

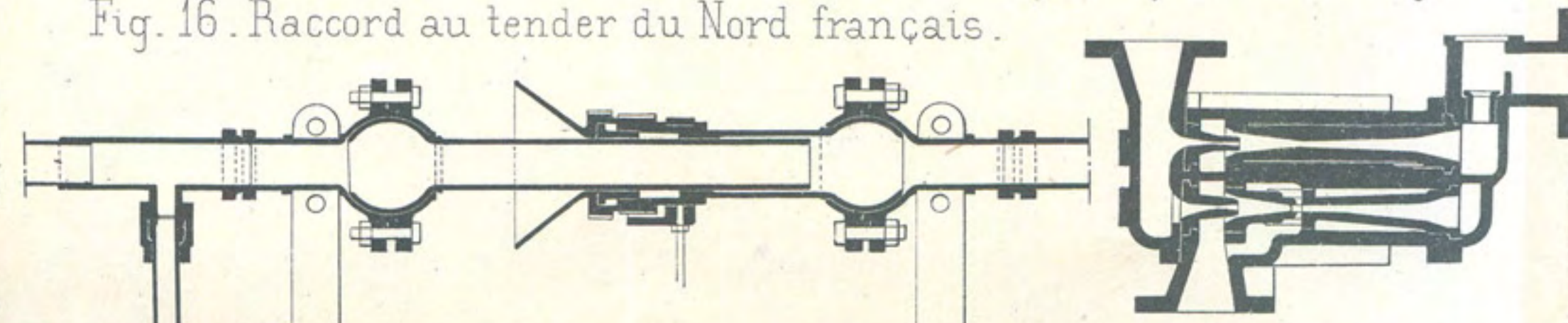
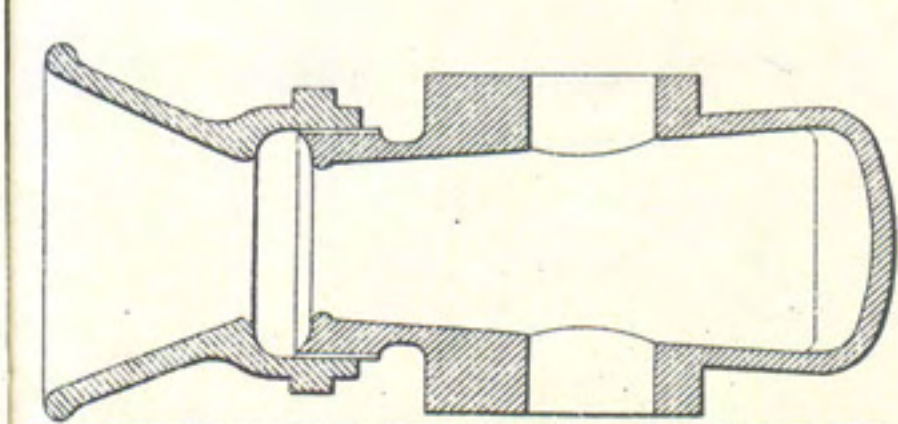


Fig. 12. Injecteur Körting universel.

Fig. 15. Accouplement pour injecteur du tender à la locomotive (Rotule) Etat Belge.



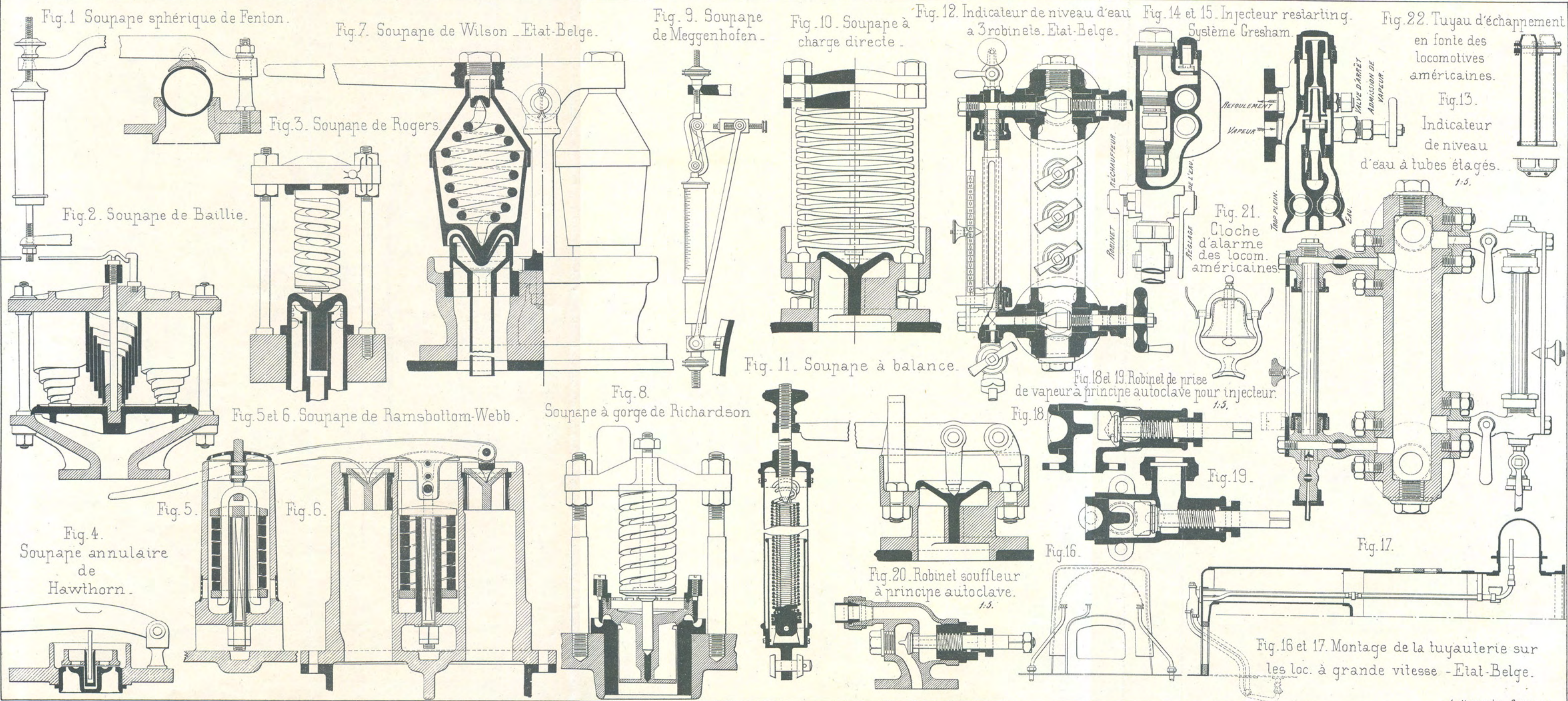


Fig. 1. Appareil Dudgeon à mandriner

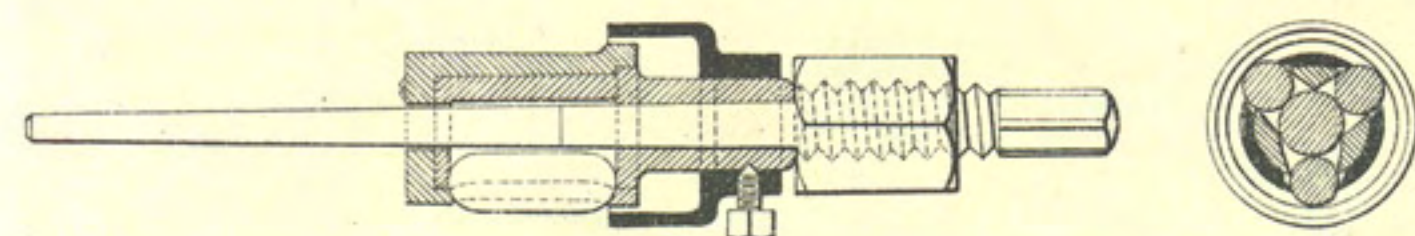


Fig. 2.

Régulateur à 2 tiroirs superposés.

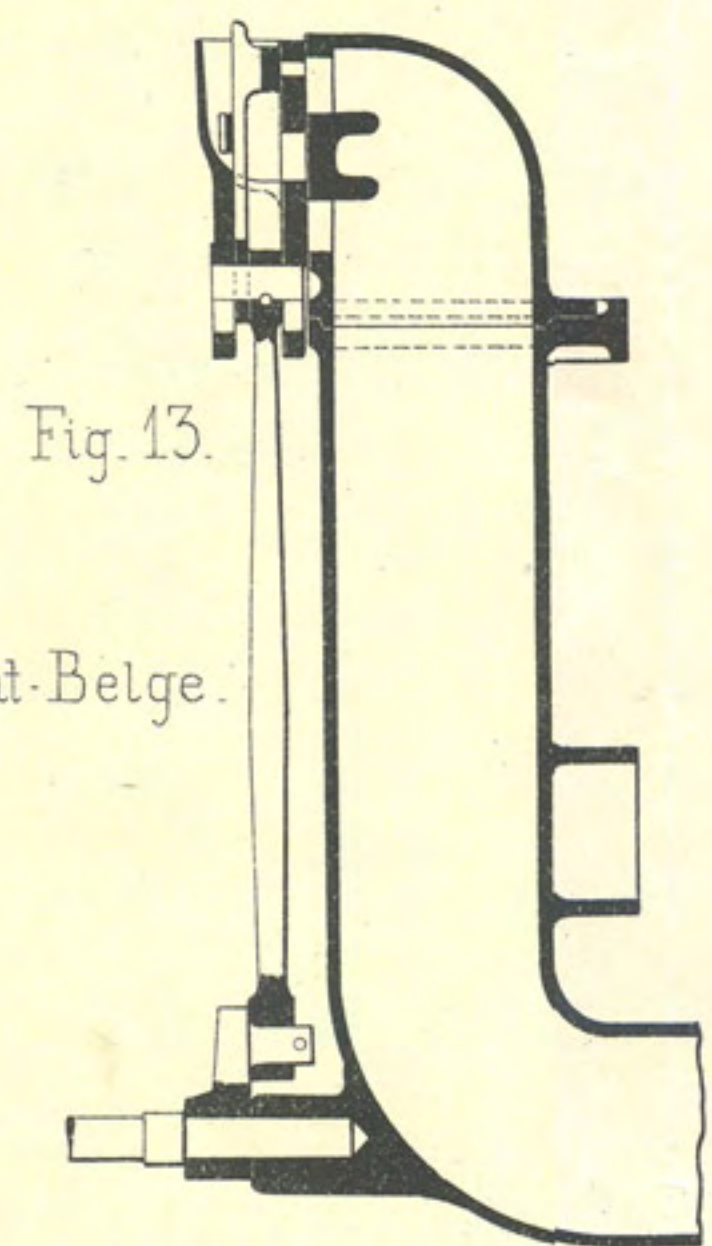


Fig. 13.

Etat-Belge.

Fig. 16.

Régulateur de Walschaerts.

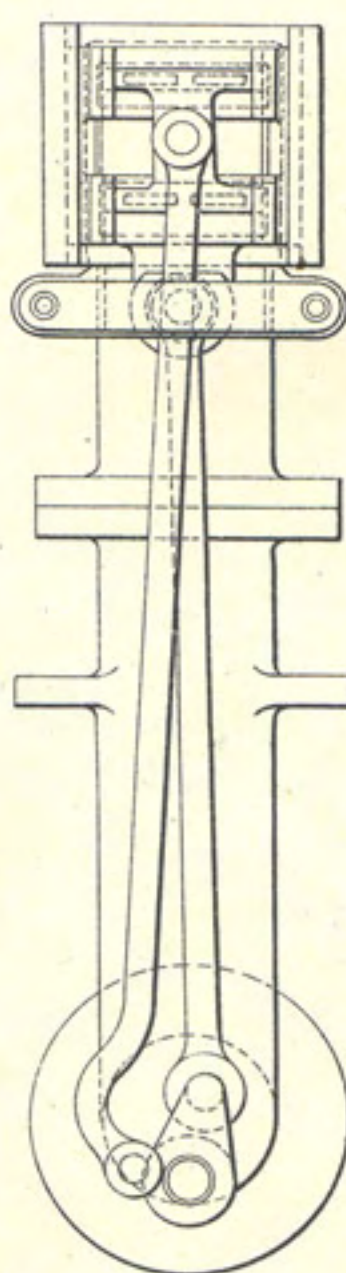


Fig. 15.

Etat-Belge

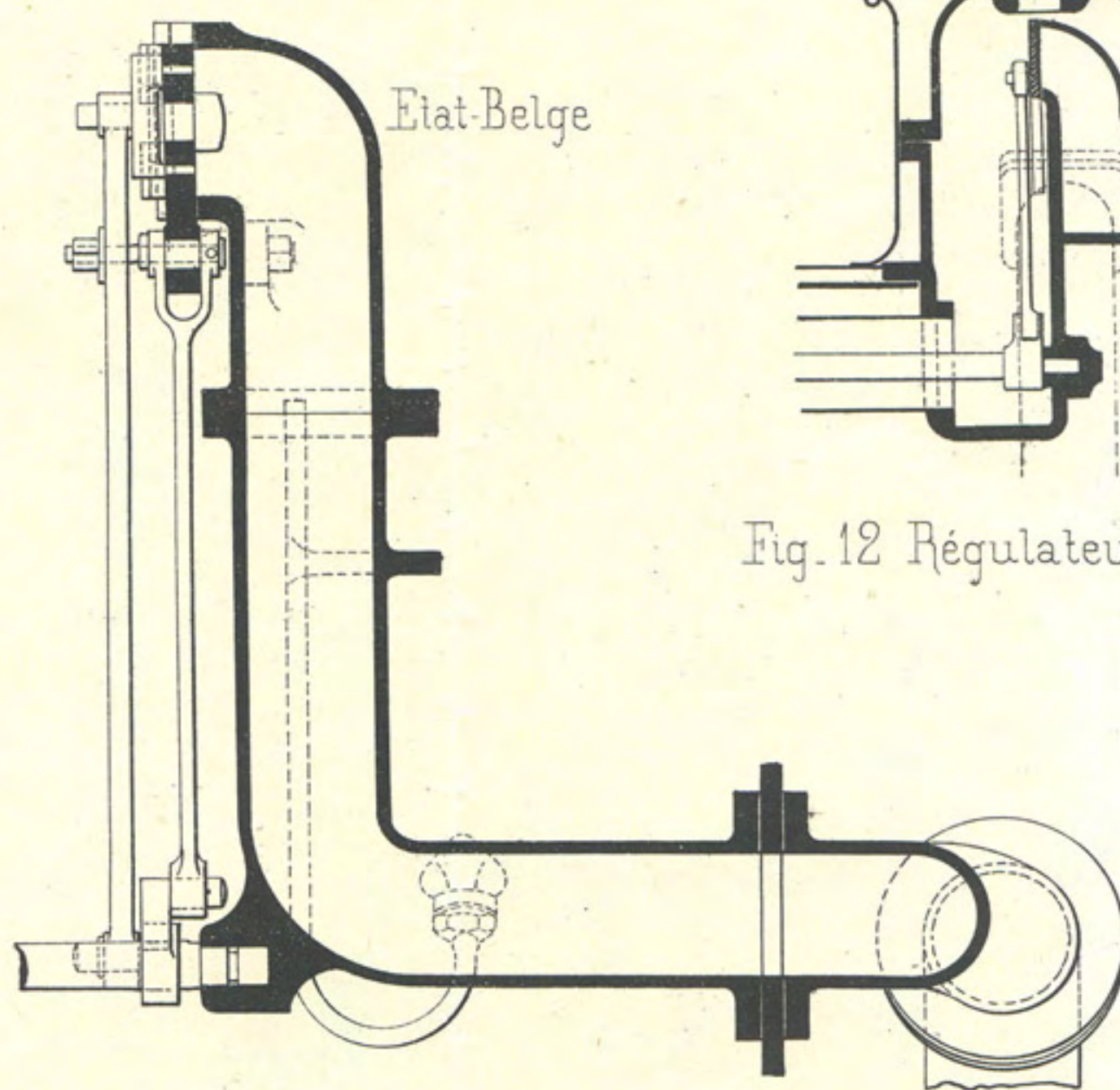


Fig. 10. Régulateur à glissière (Fribourg-Lausanne).

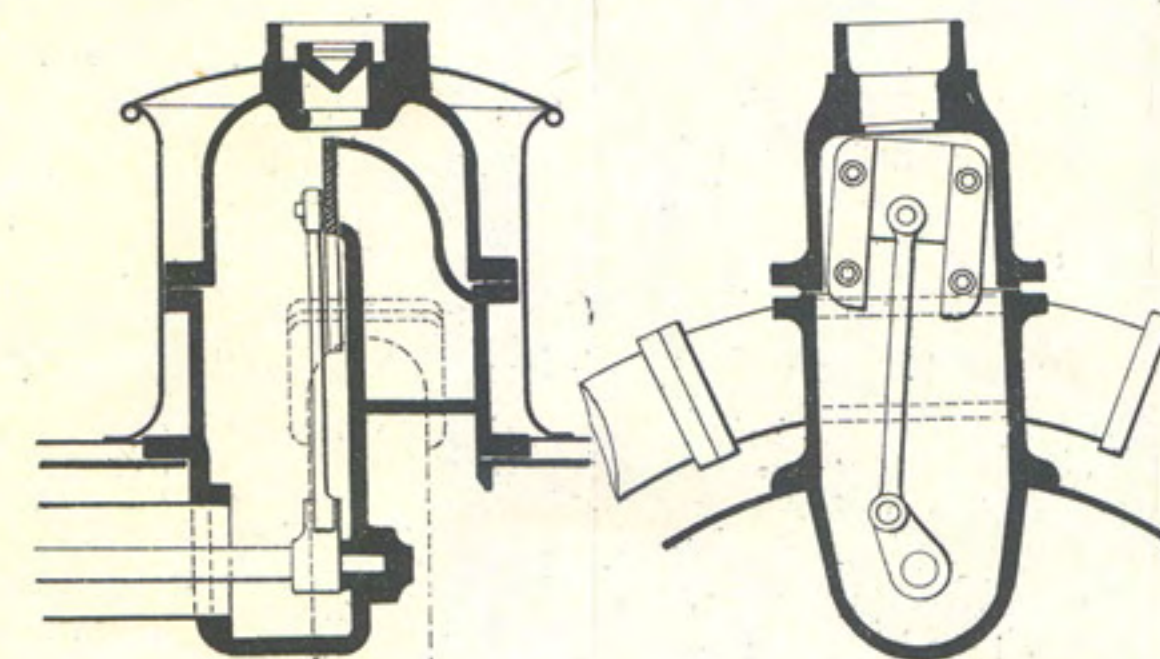


Fig. 11.

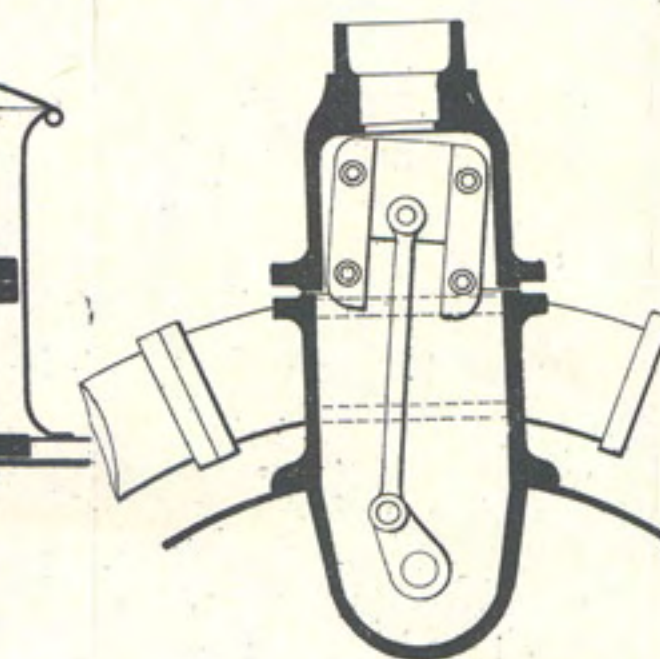
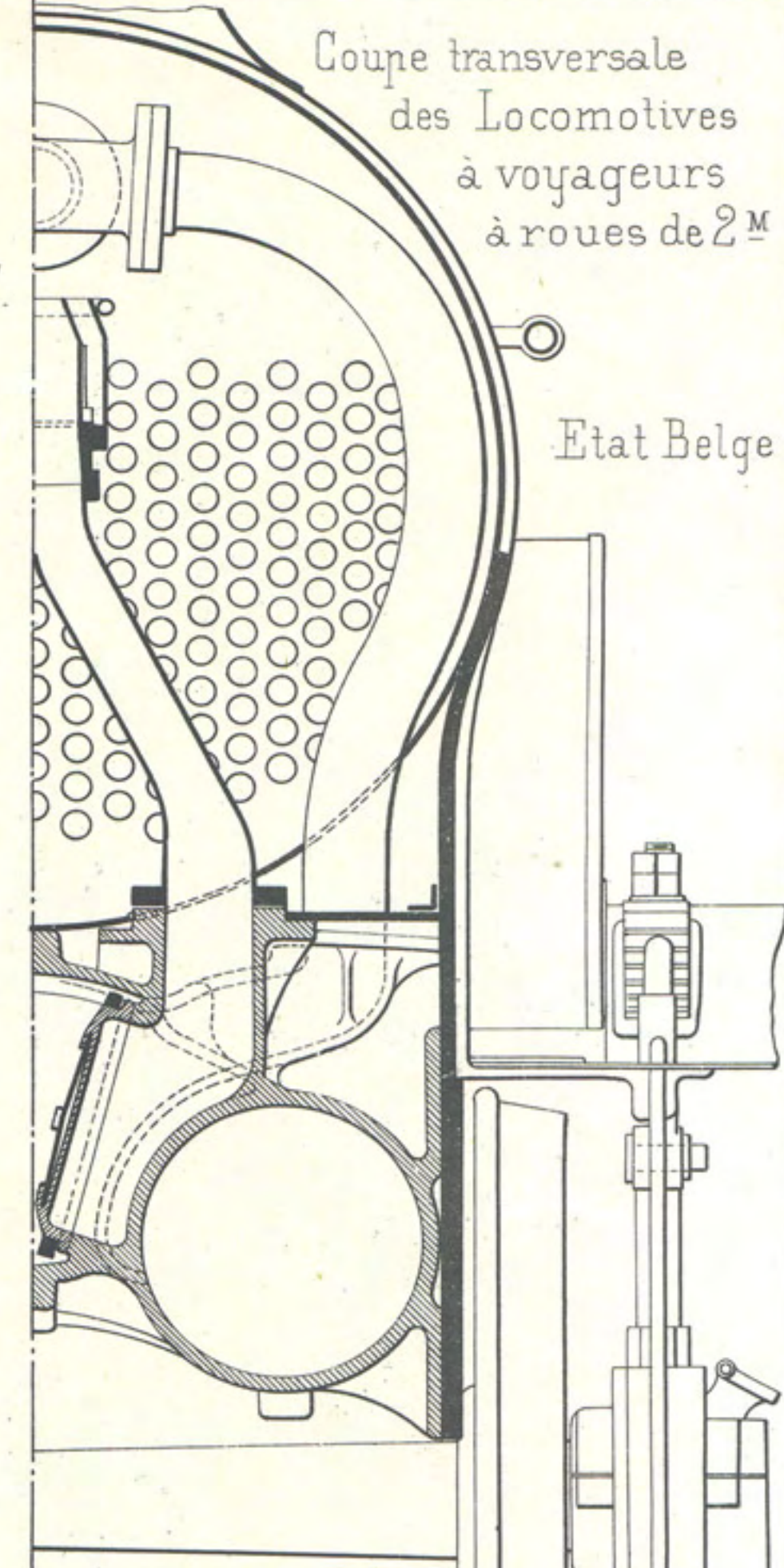


Fig. 17.



Coupe transversale des Locomotives à voyageurs à roues de 2<sup>m</sup>

Etat Belge

Fig. 3. Ejecto-Injecteur de Guau.

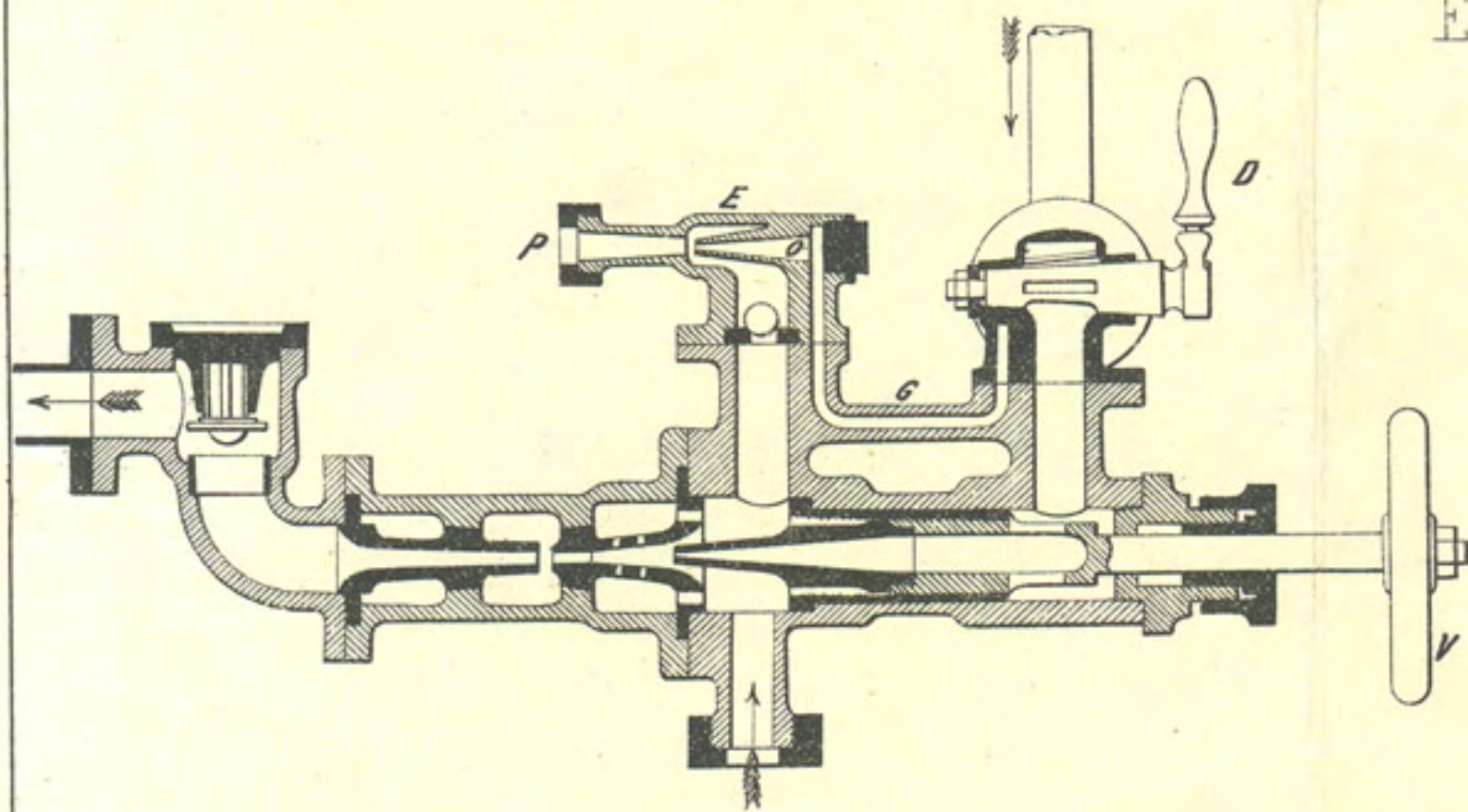


Fig. 4. Injecteur aspirant de Polonceau.

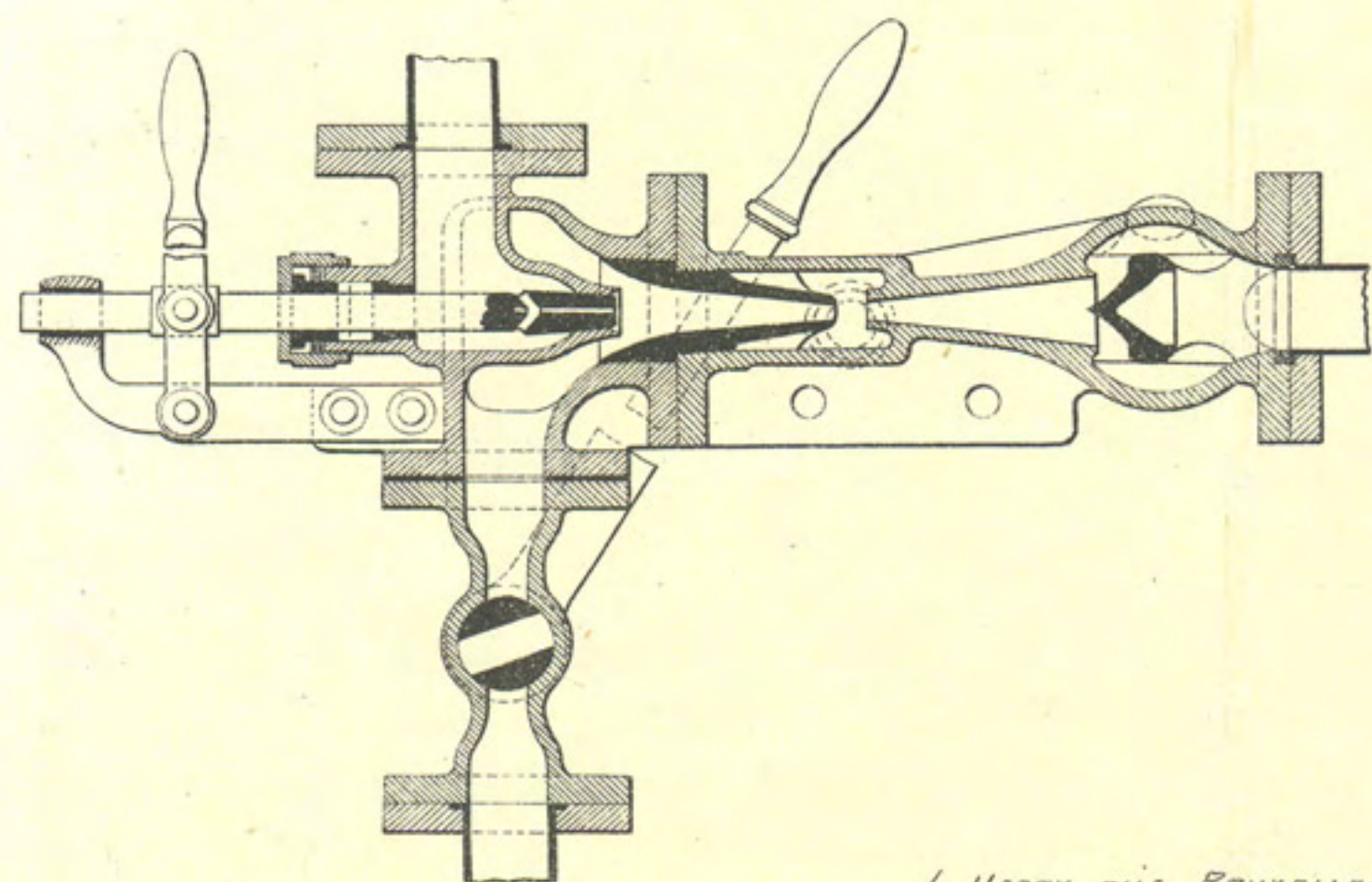
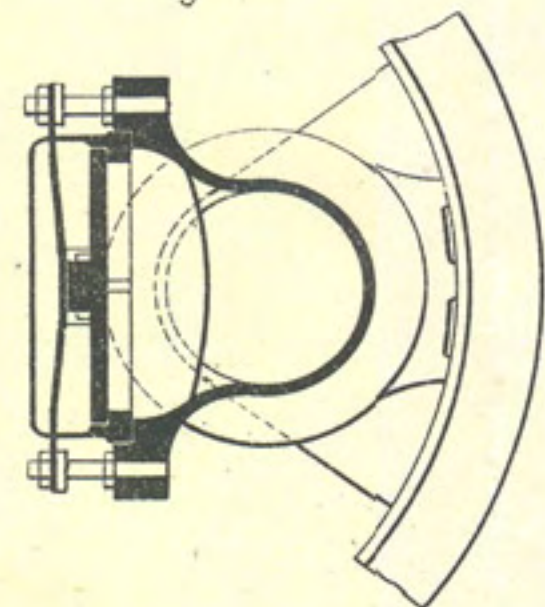


Fig. 14.



Régulateur à papillon

Fig. 8.

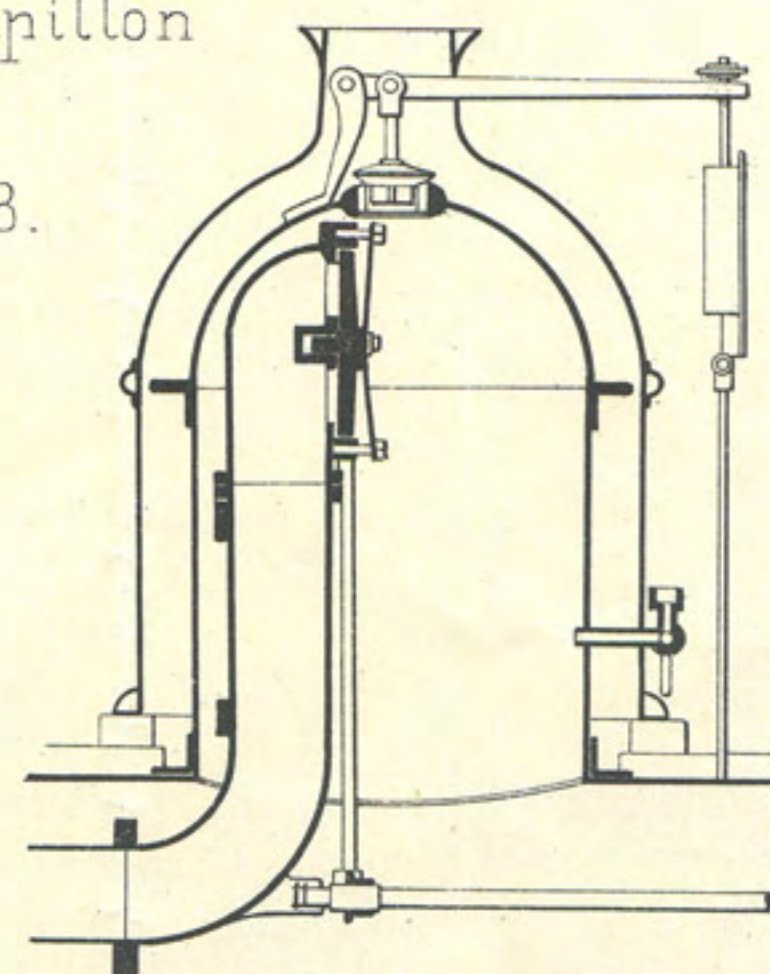
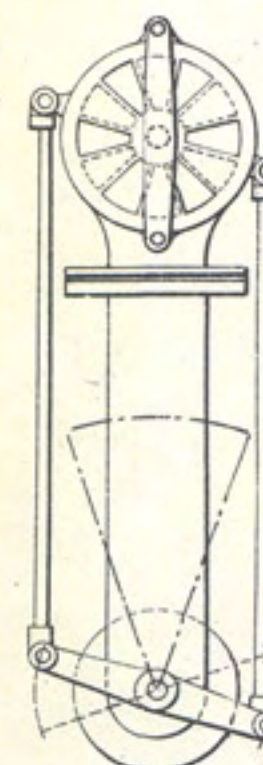


Fig. 9.



Régulateur à soupape équilibrée

Fig. 5.

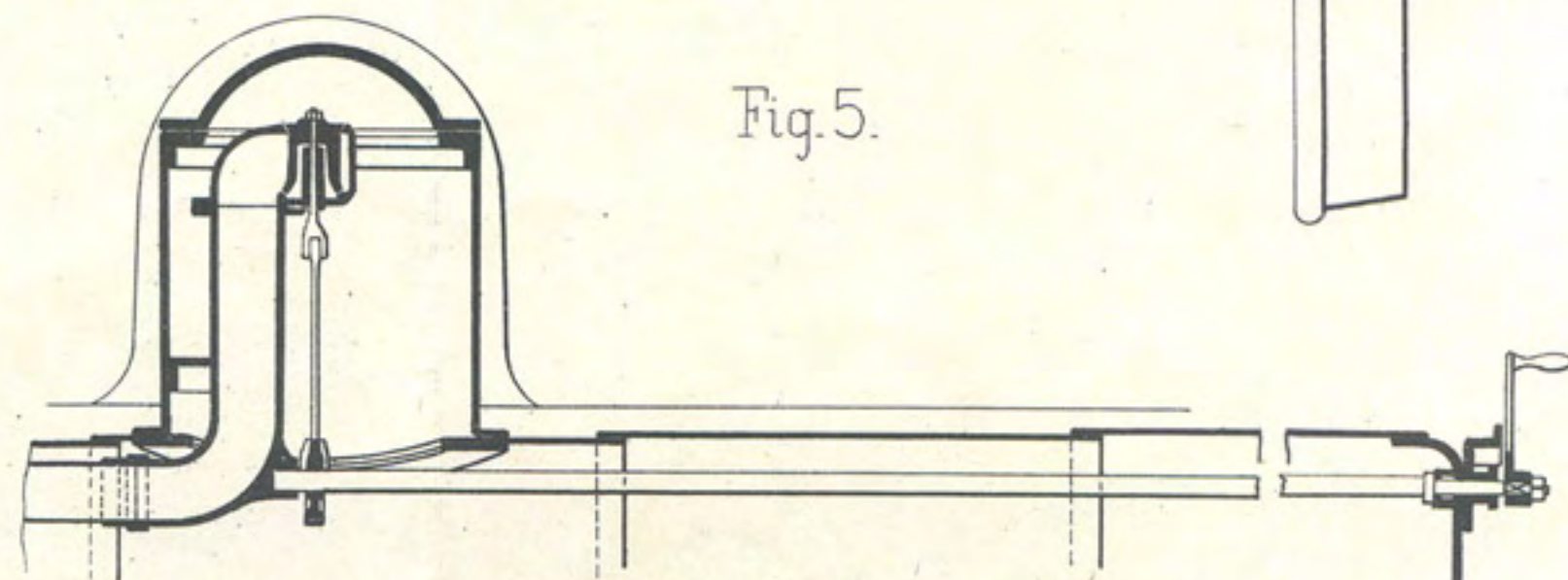
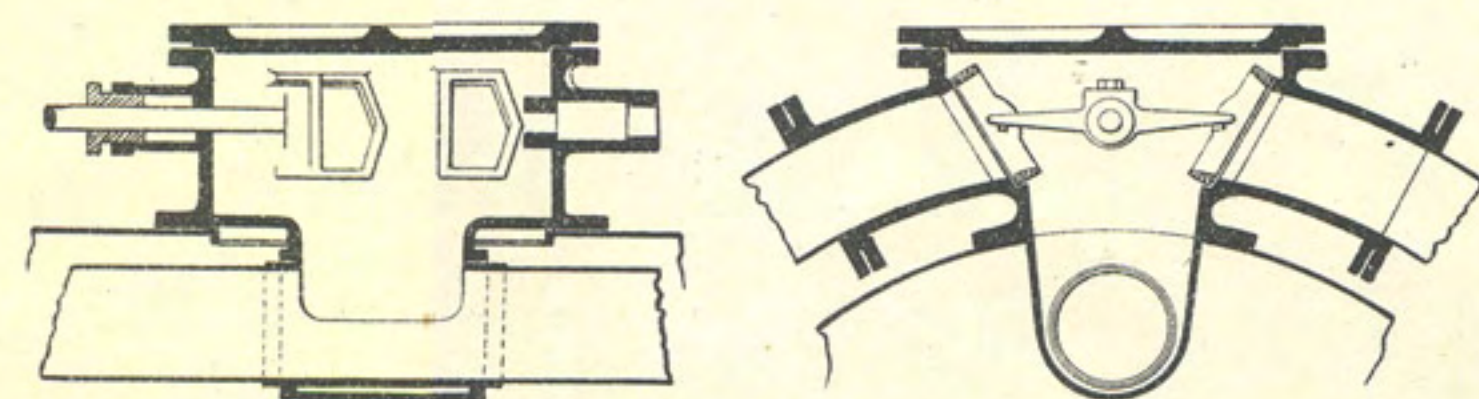
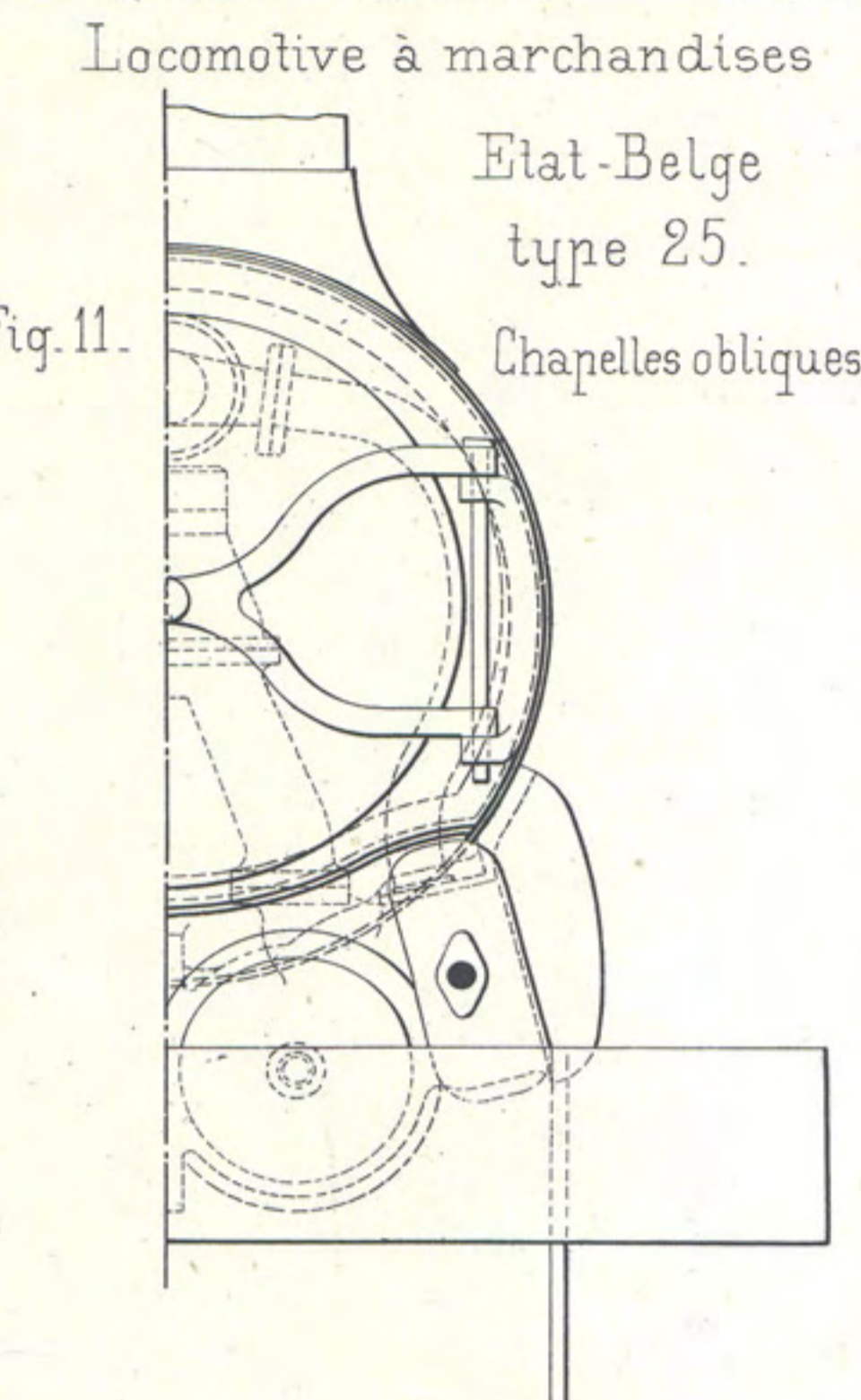
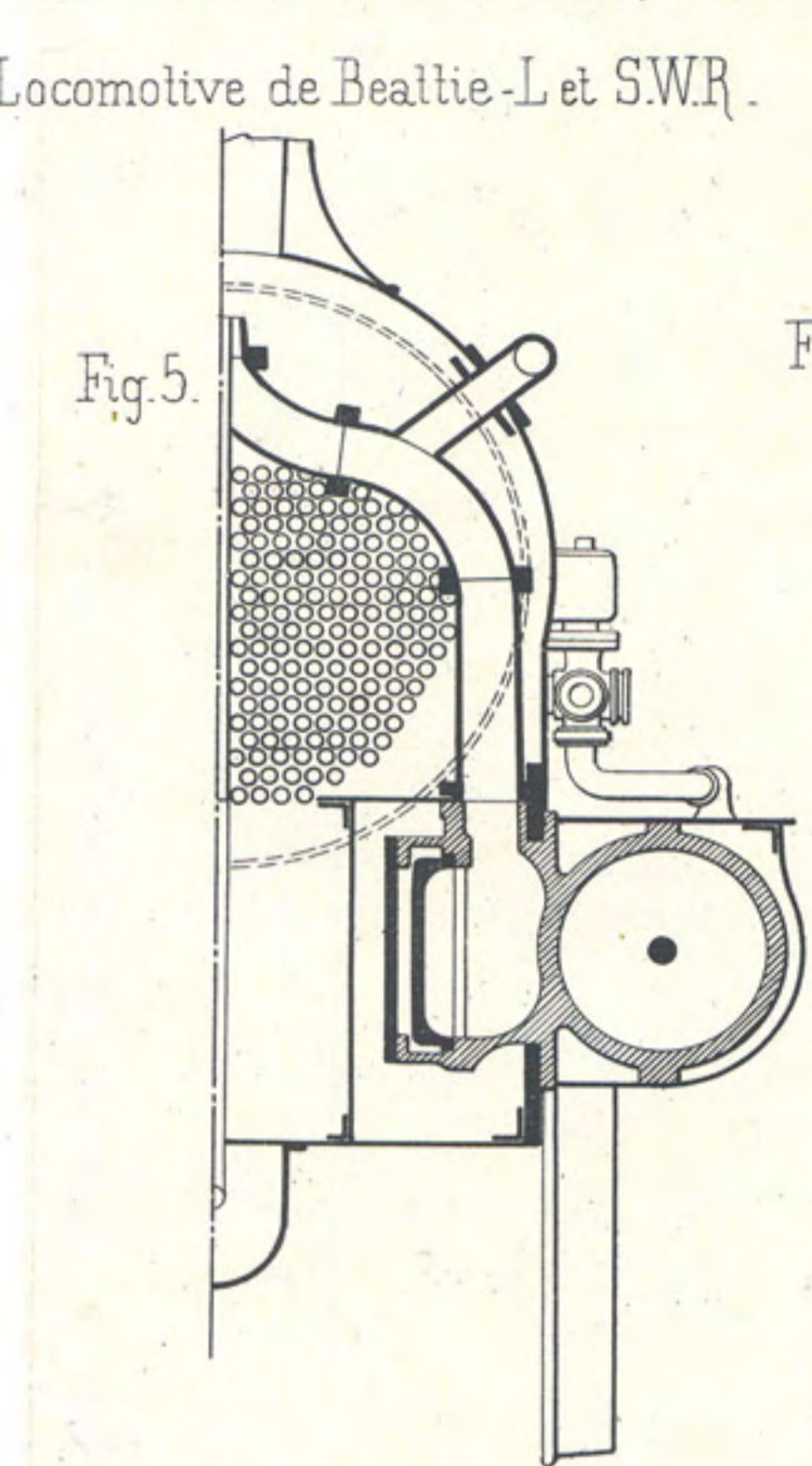
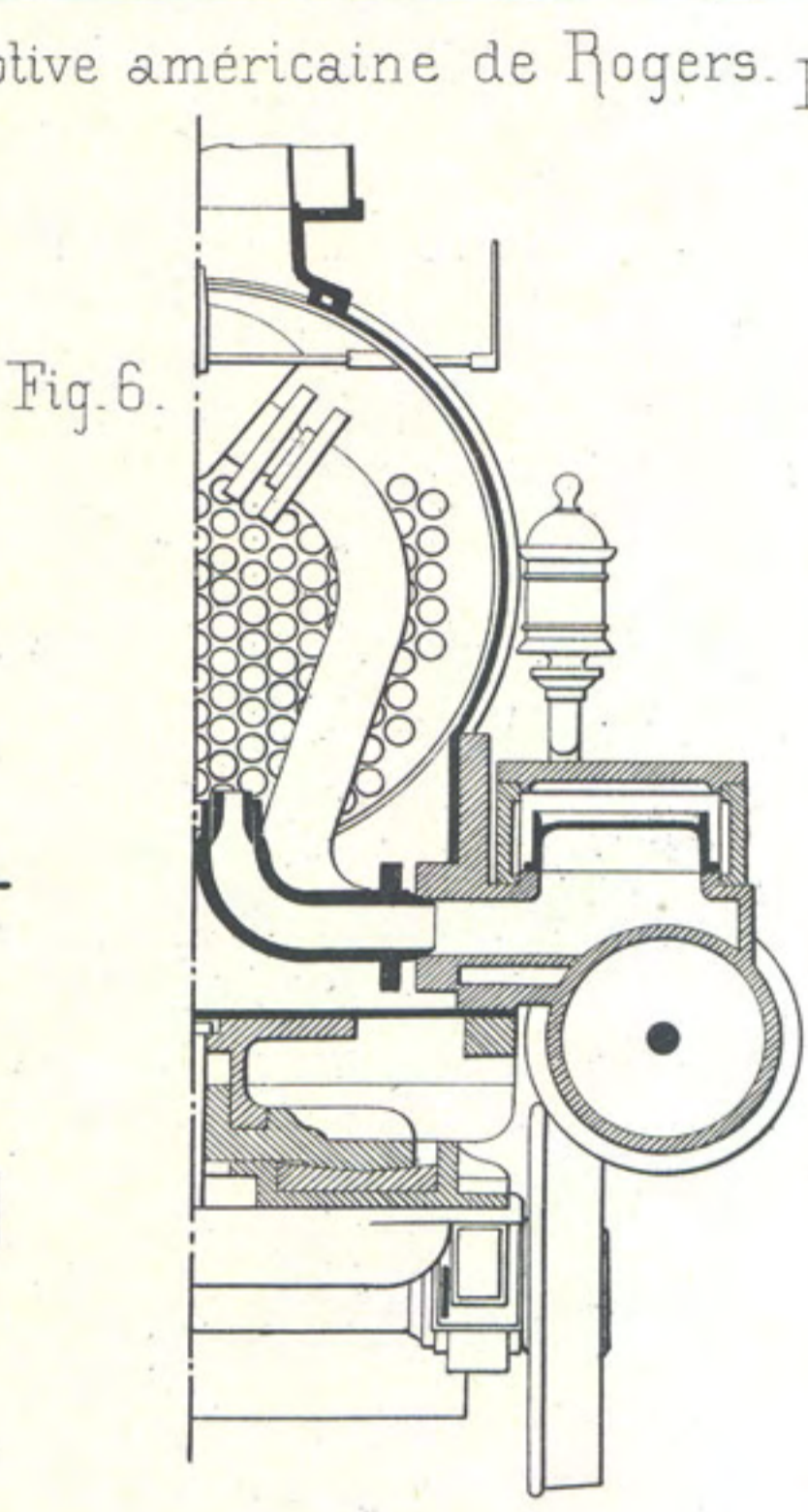
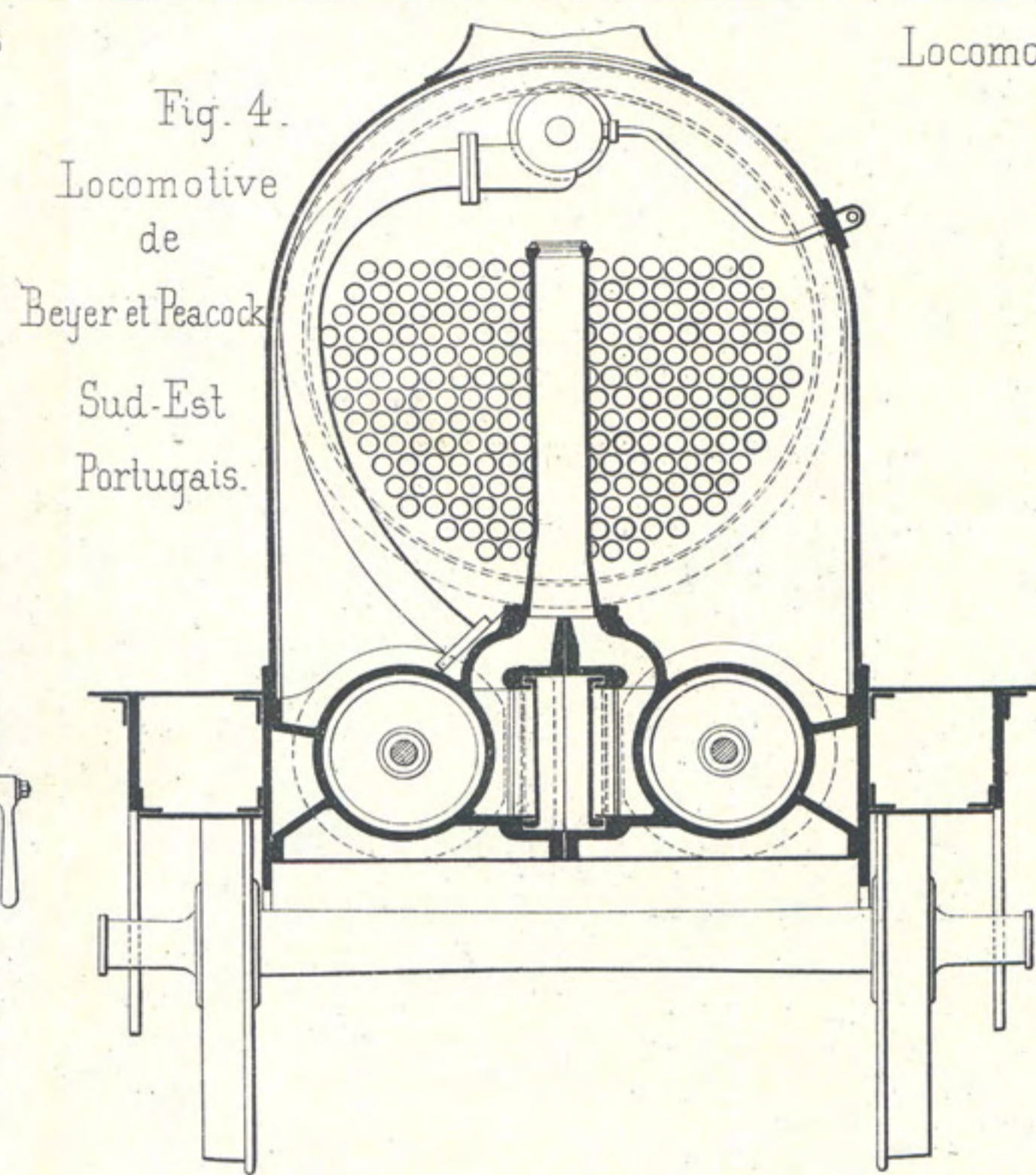
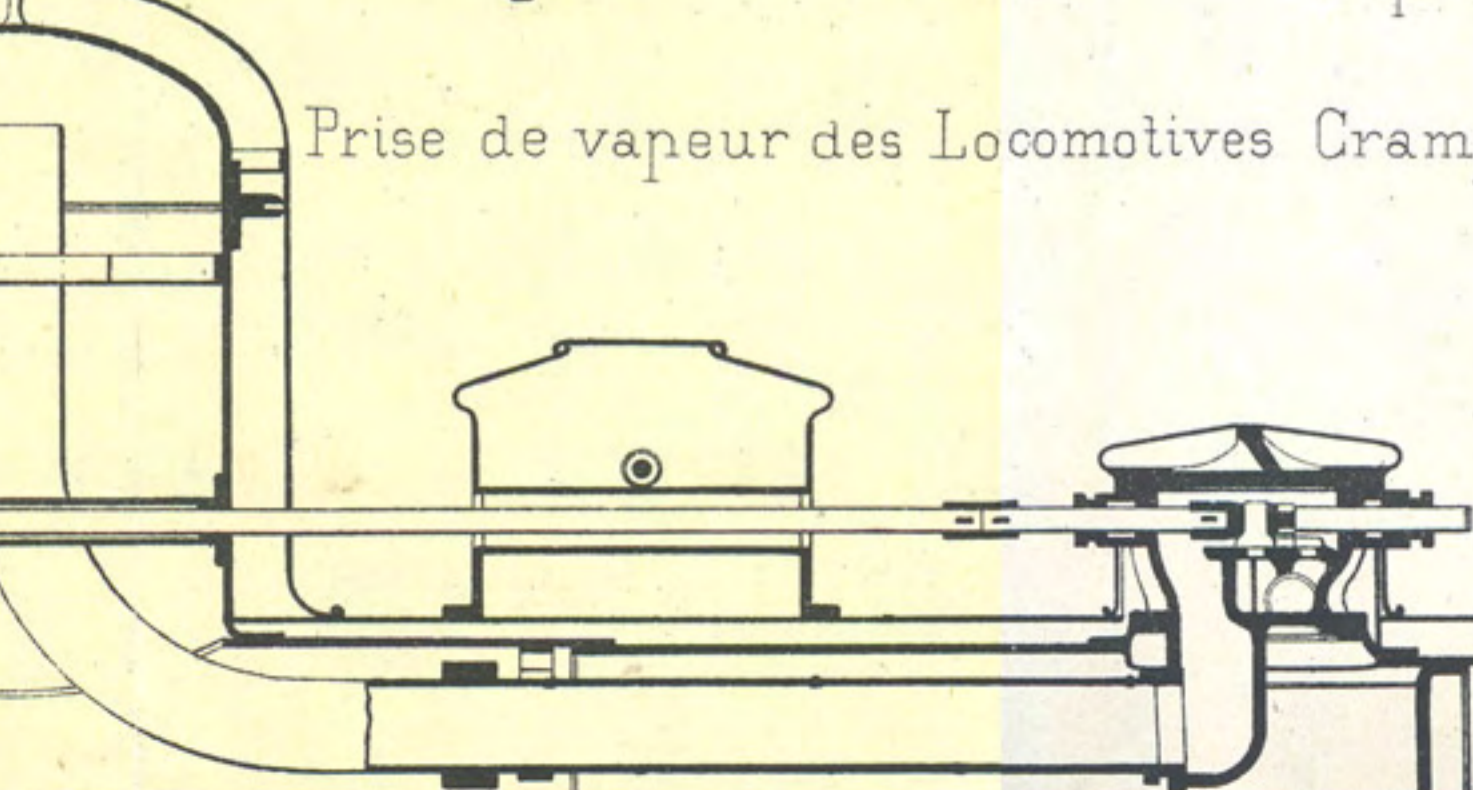
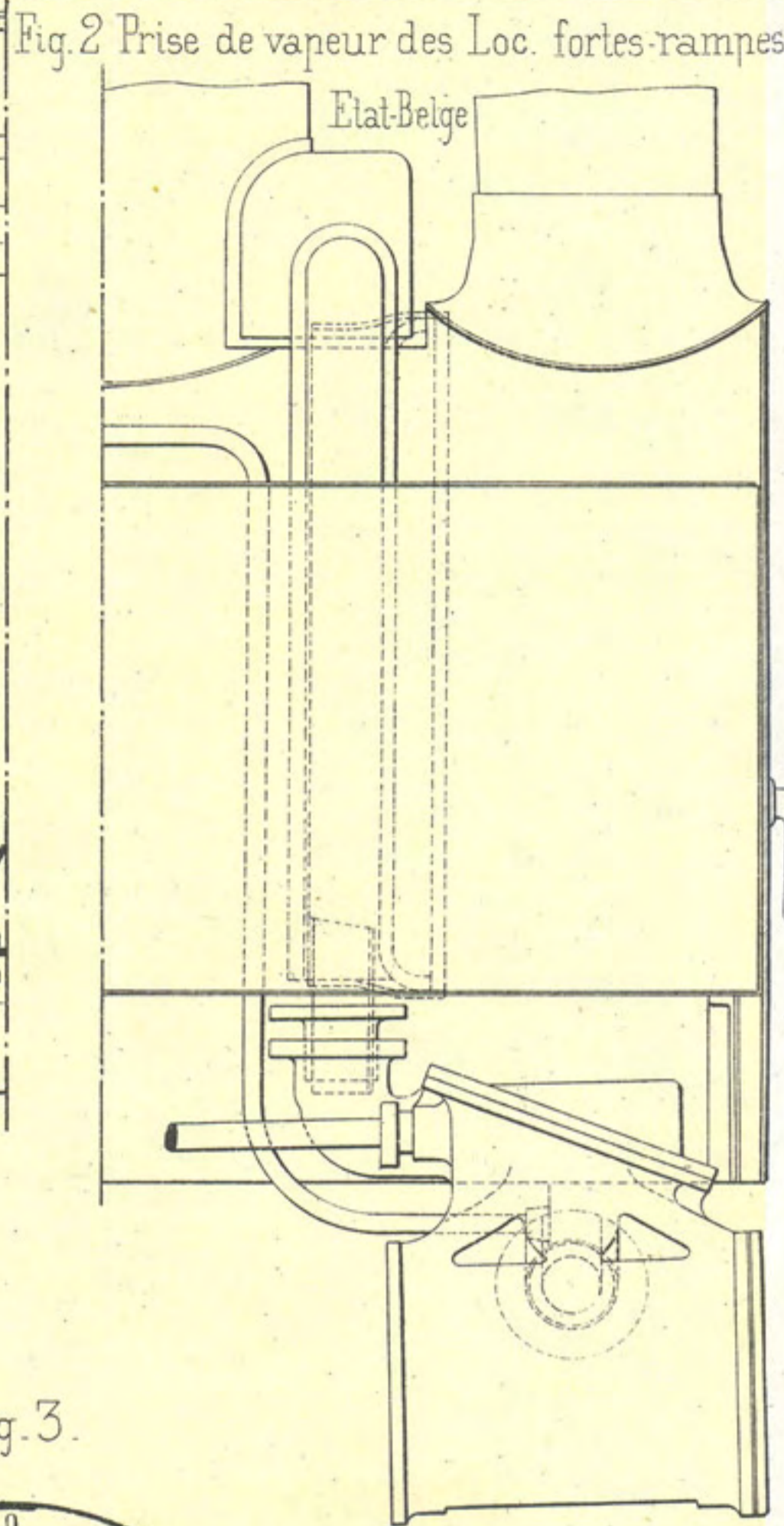
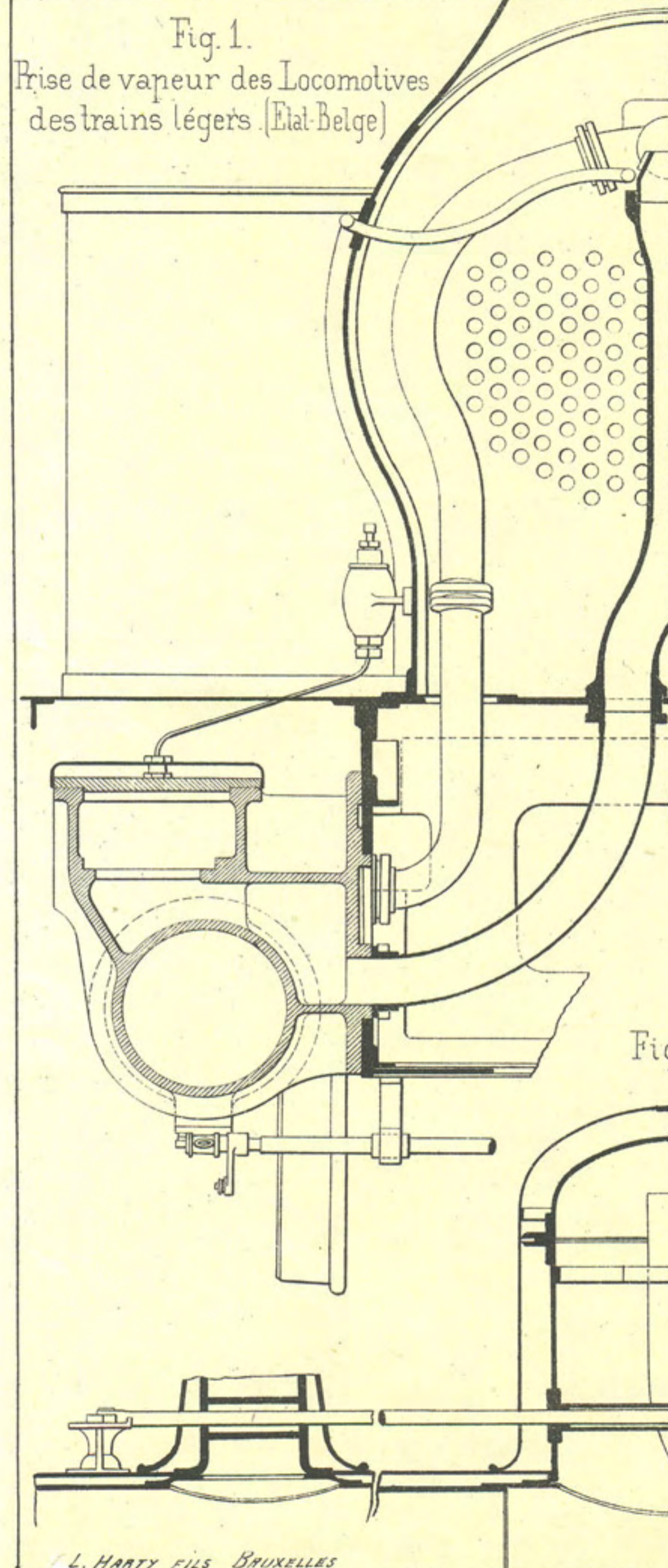


Fig. 6 et 7. Régulateur à deux tiroirs de Crampton.





Locomotive Ch. de fer d'Orléans. Locomotive Ch. de fer du Rhône.

Locomotive de Scharp Roberts

Locomotive Crampton

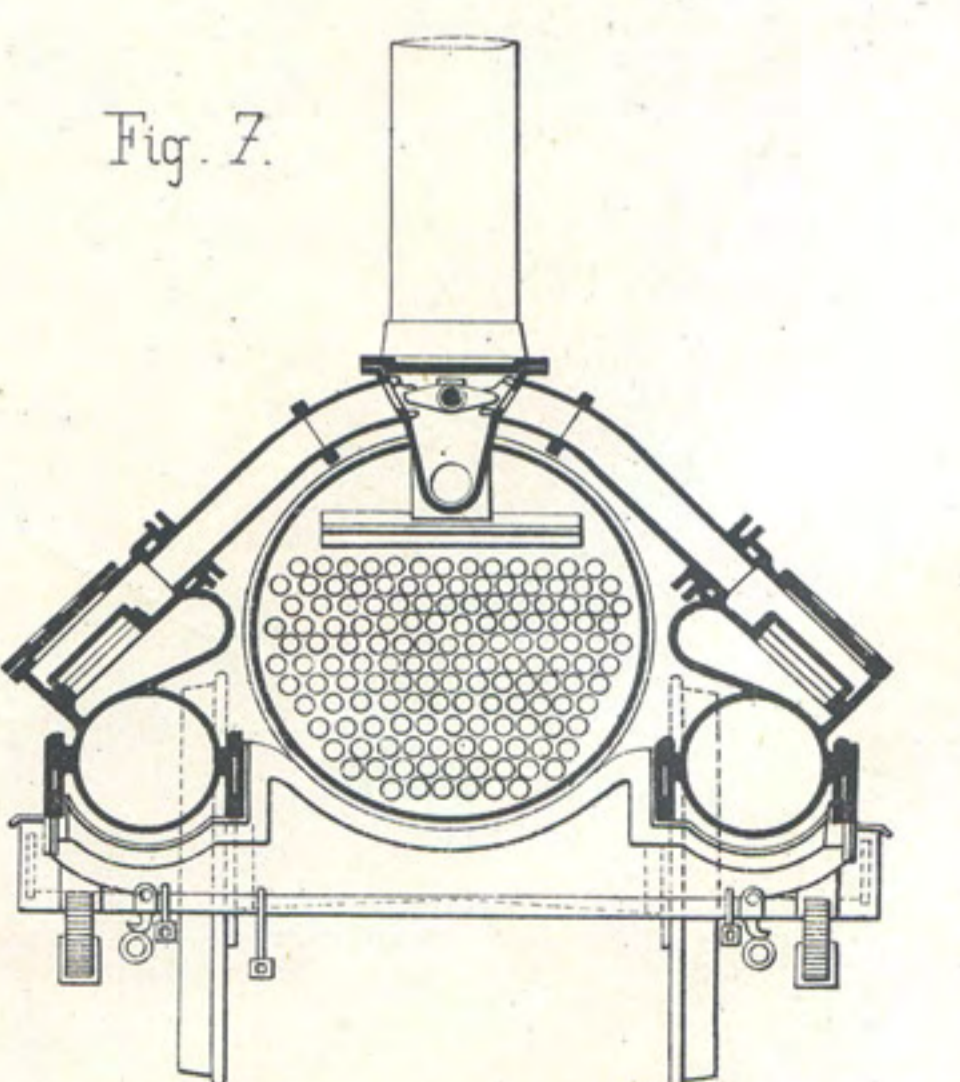
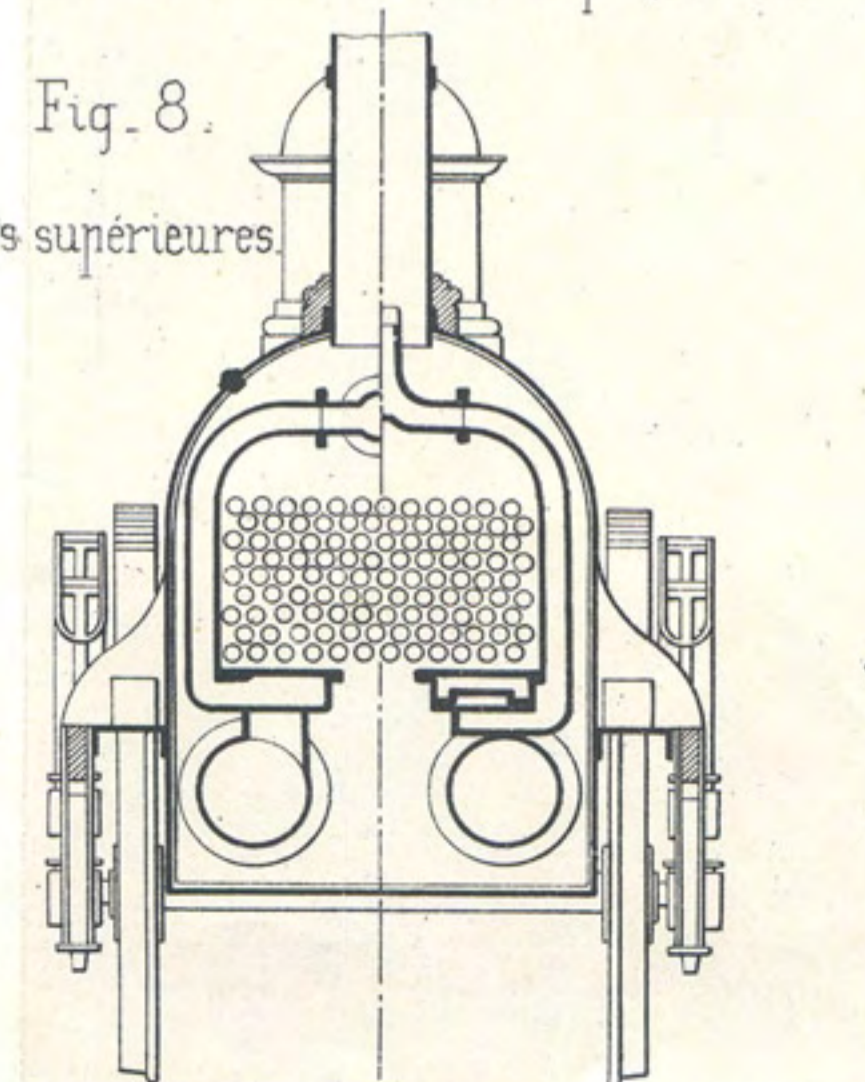
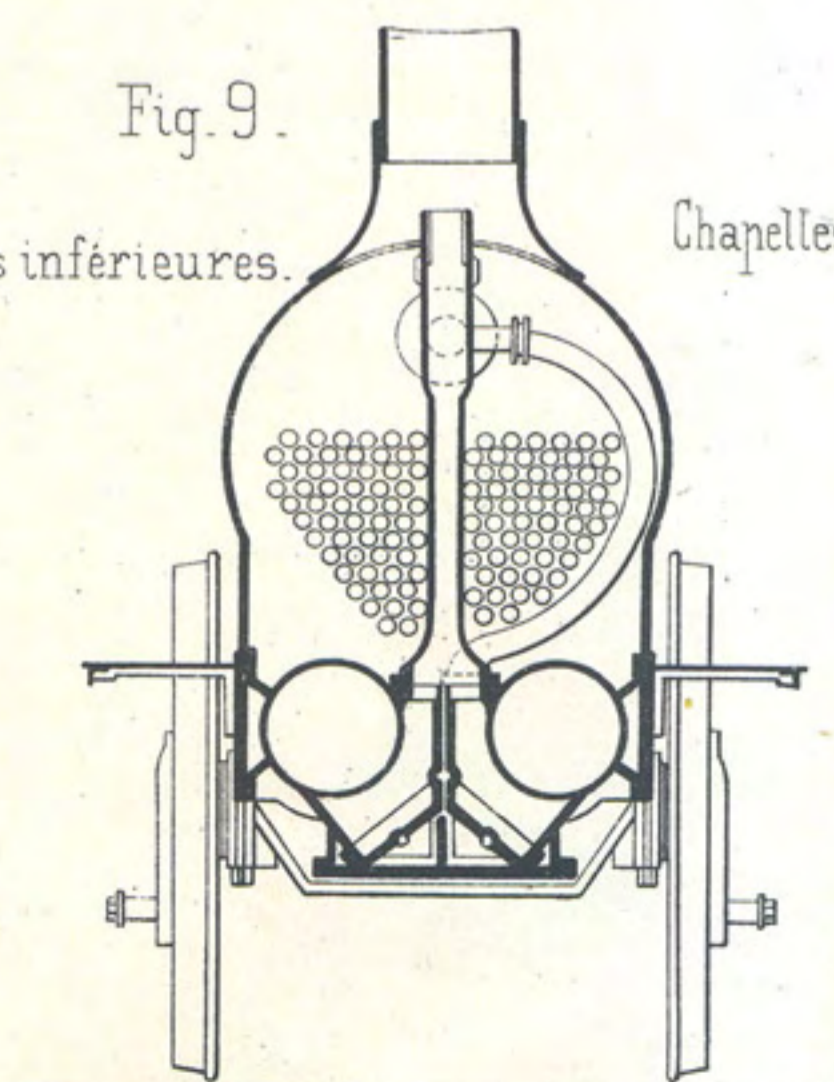
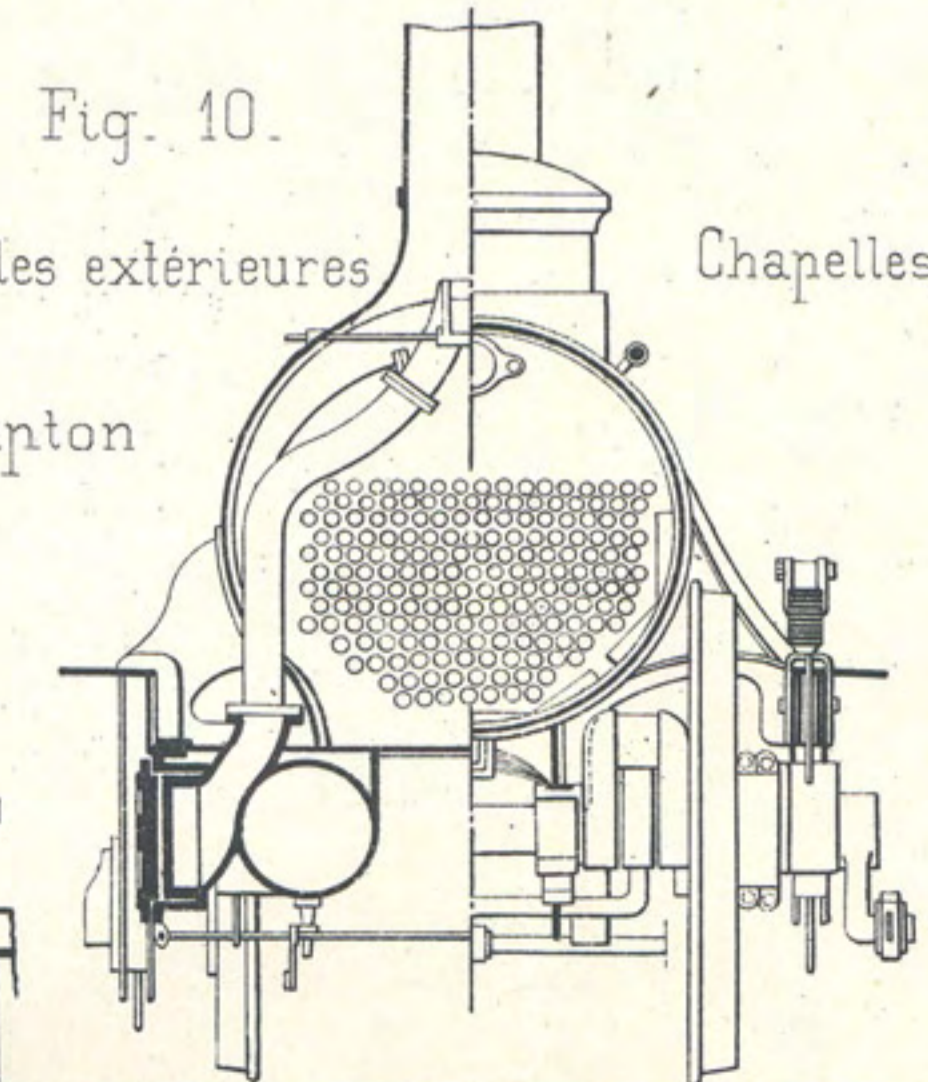




Fig. 1 à 4. Positions relatives des cylindres par rapport aux longerons et aux roues.

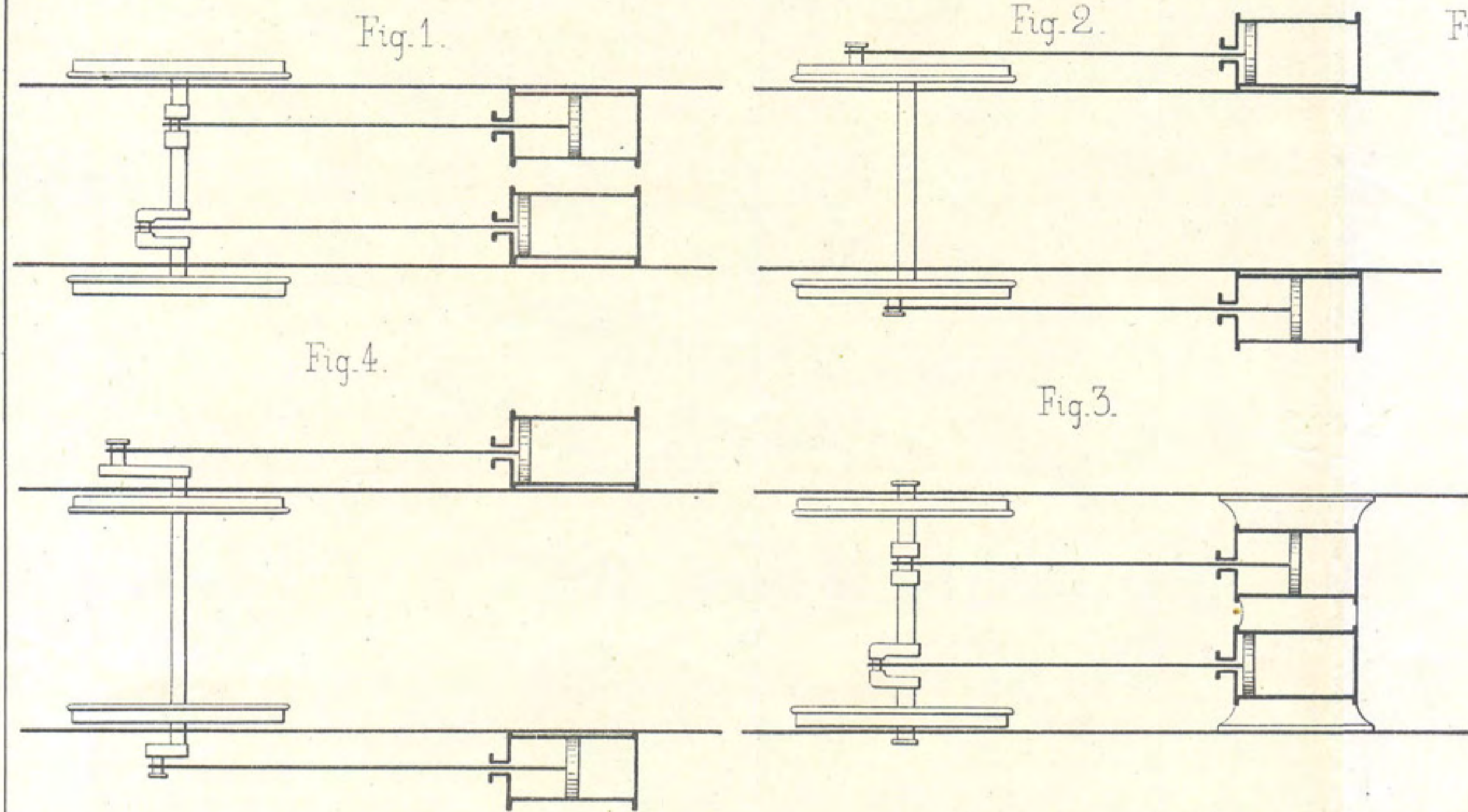
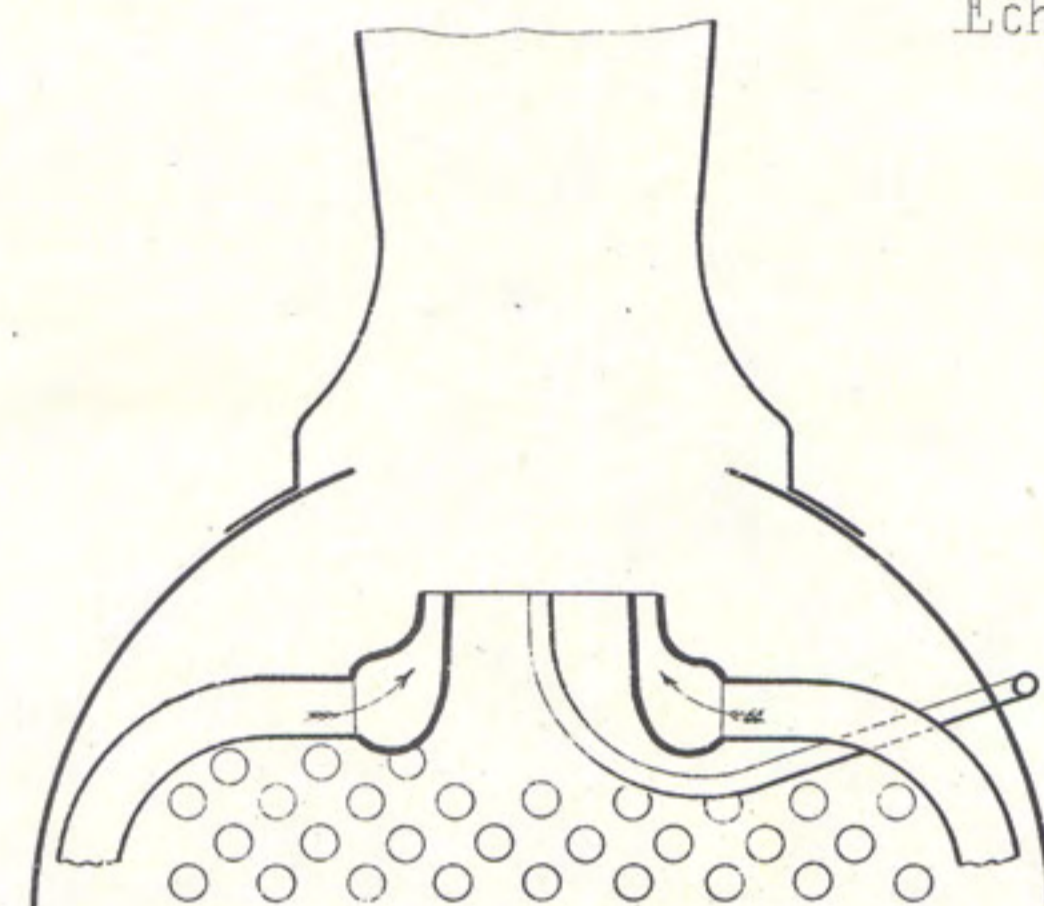


Fig. 5. Echappement annulaire de Brown.



Echappement variable de Polonceau.

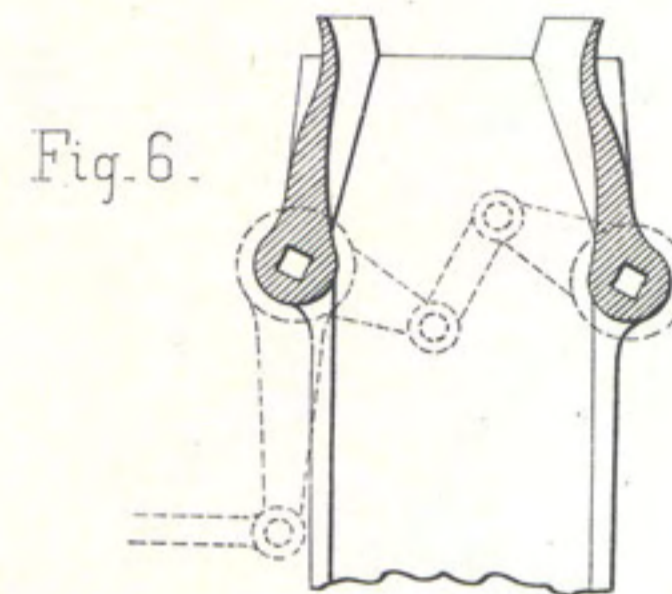
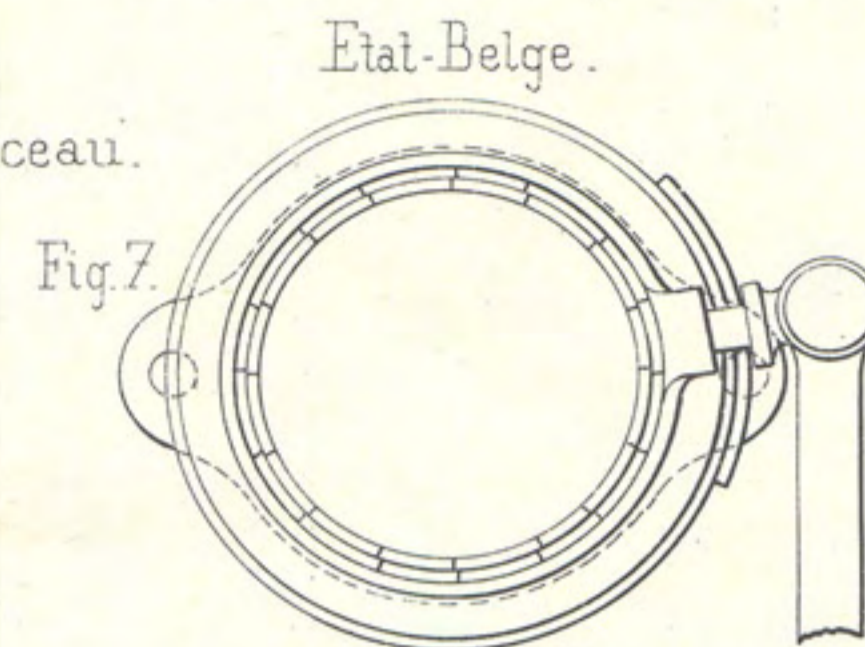
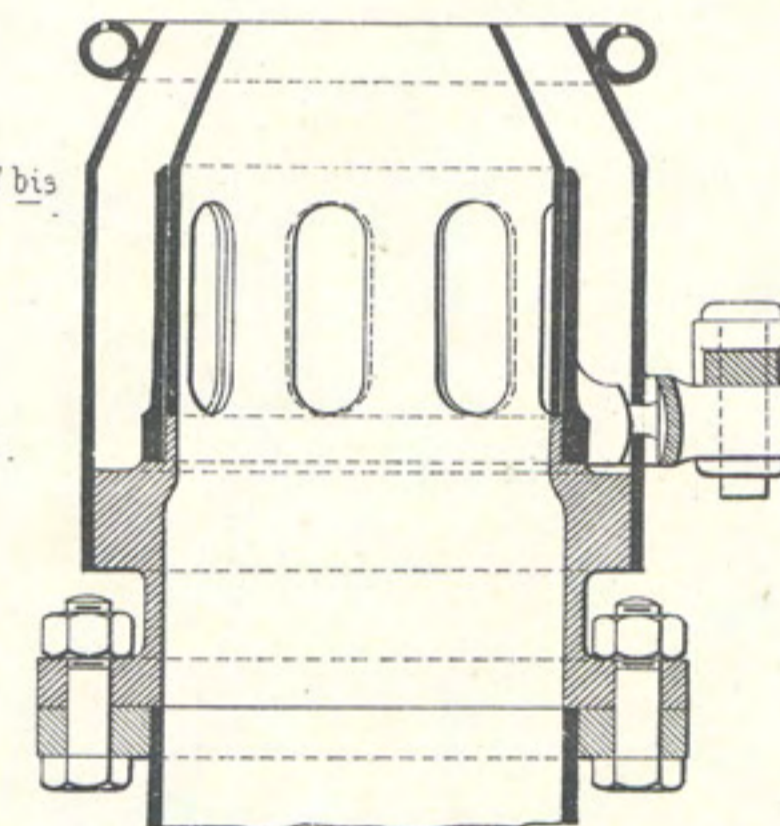


Fig. 7 et 7 bis. Lanterne de décharge variable.



Etat-Belge.

Fig. 7 bis.



Boîte à fumée, Cheminée et Tuyau de décharge  
Loc. d'essai de l'Est Français.

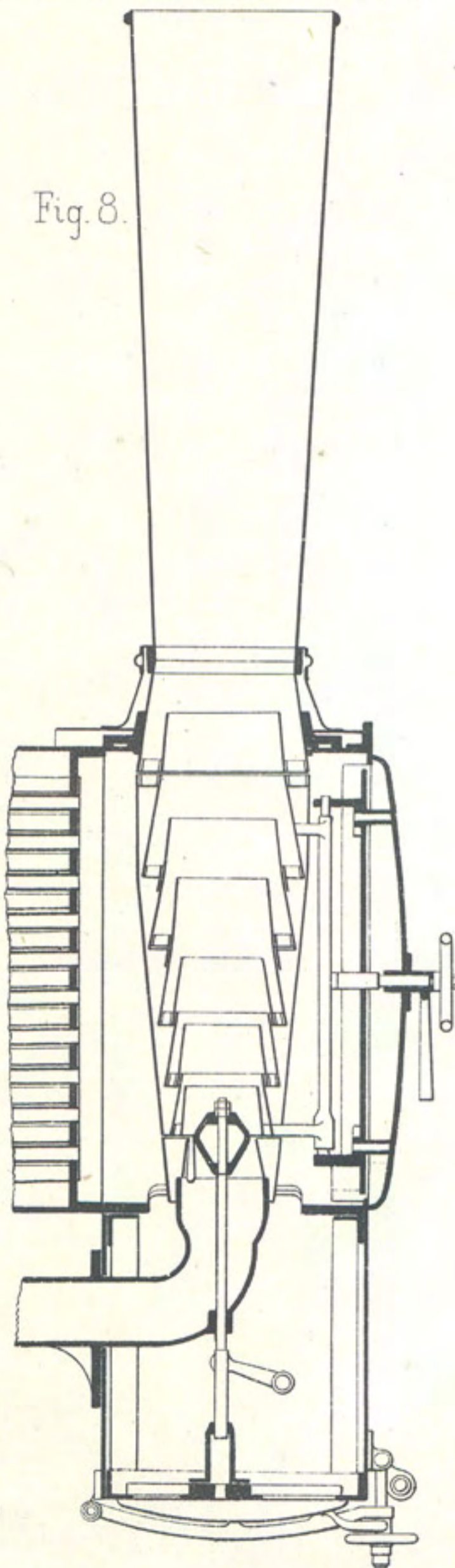
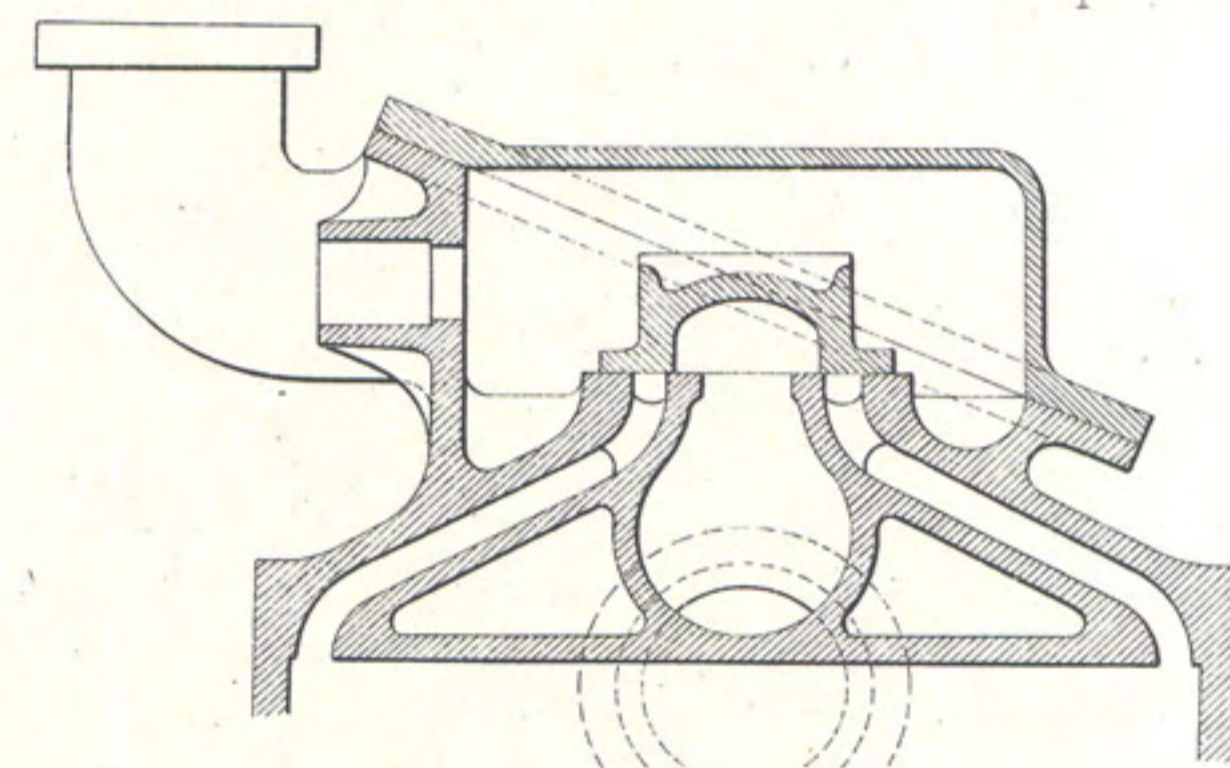


Fig. 11. Chapelle, Tiroir et Lumières des Loc. fortes rampes. Etat-Belge.



Cylindres et Chapelles des Loc. à march.

Cylindres des Loc. du Ch. de fer Pennsylvanien.

Fig. 9. Etat-Belge.

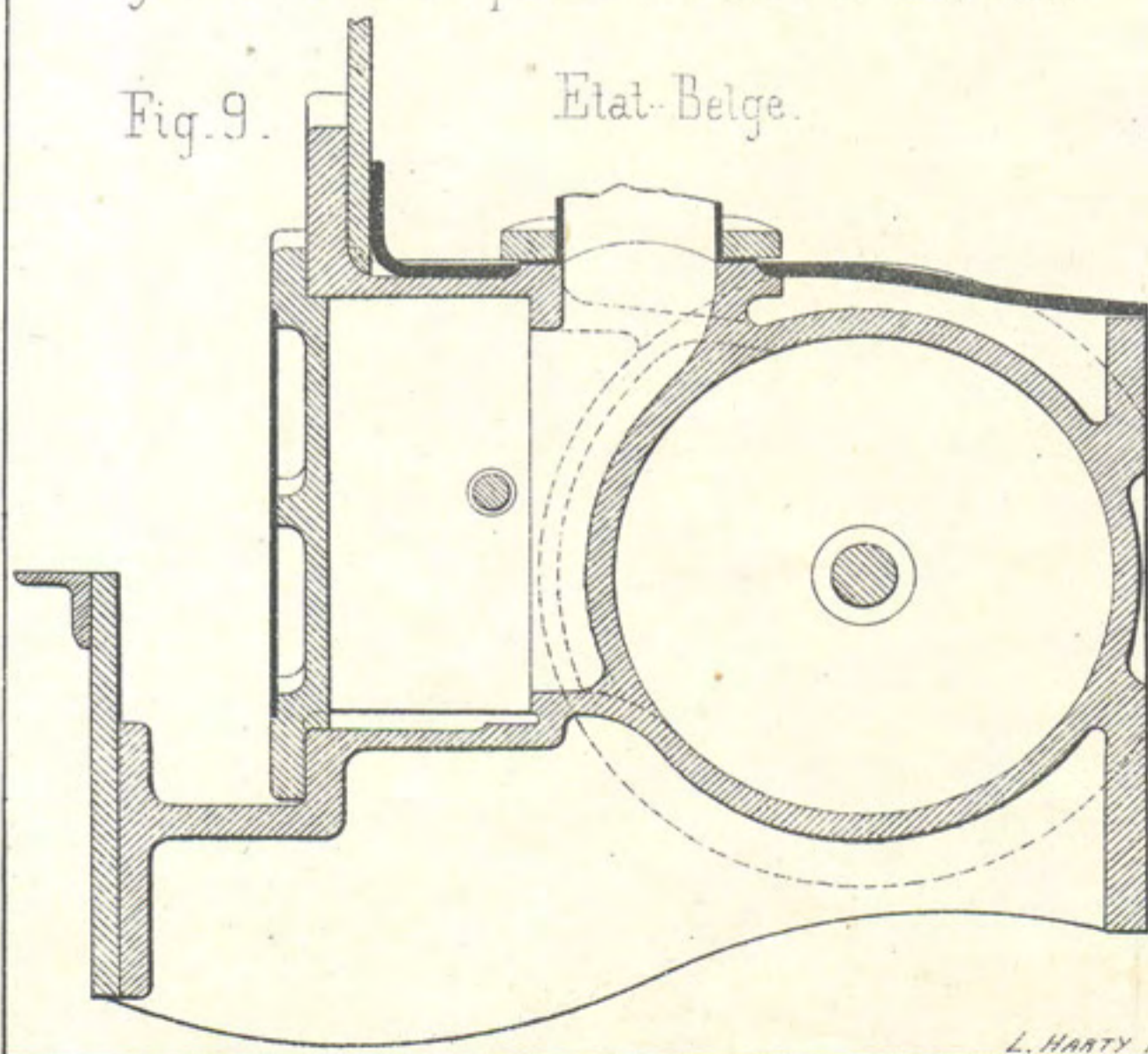


Fig. 10.

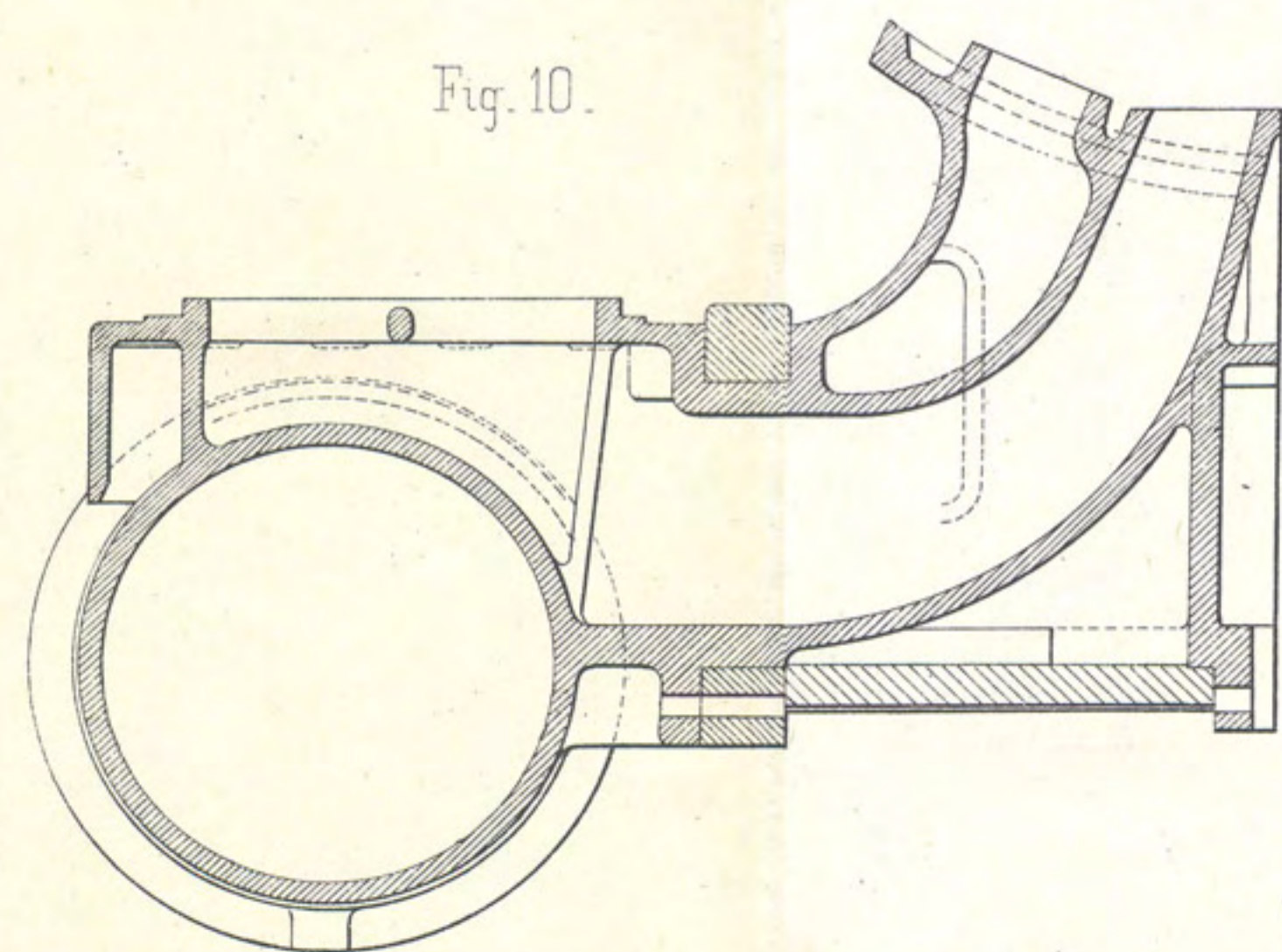


Fig. 12 et 13. Garniture de métal blanc pour tiroirs.

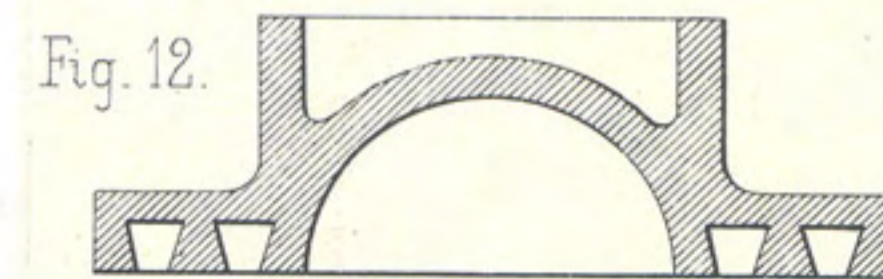


Fig 14 et 15. Tiroir Allan-Trick.

Fig. 14.

Fig. 15.

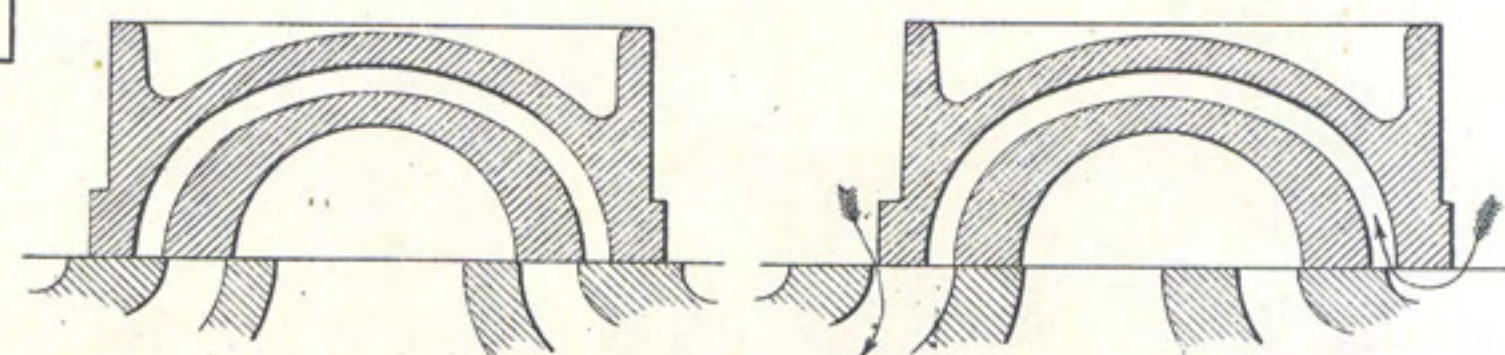


Fig. 13.

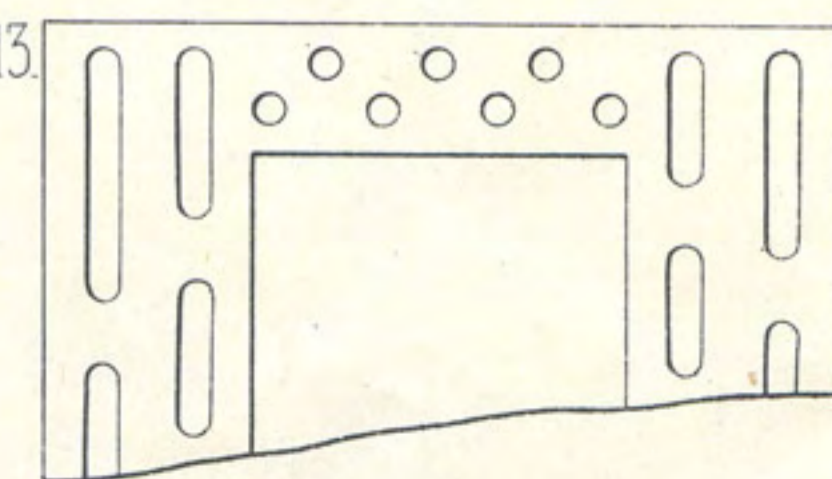


Fig. 1. Cylindres Woolf Du Bousquet.

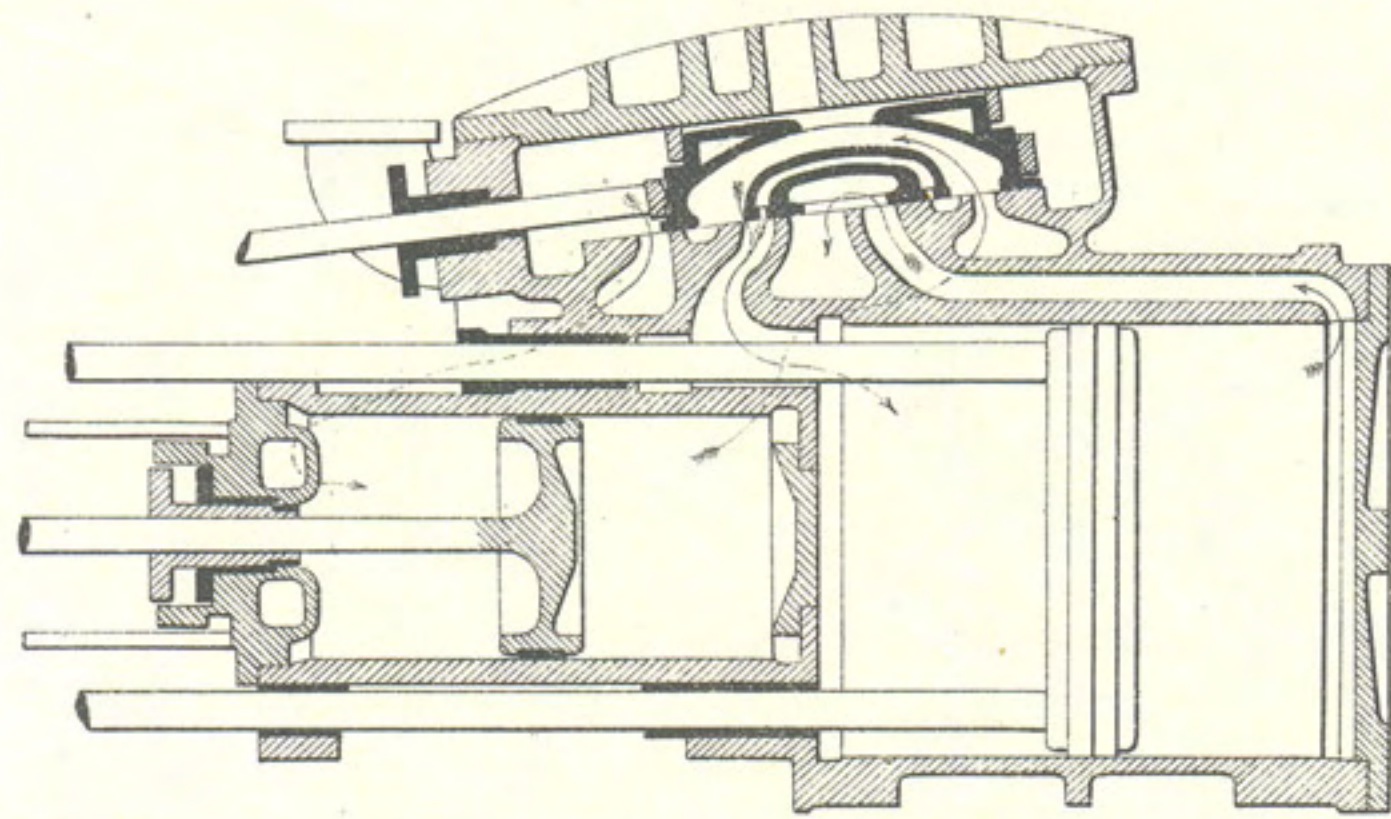


Fig. 2, 3 et 3 bis. Cylindres et Chapelles des loc. Compound de Baldwin.

Fig. 2. COUPE EN TRAVERS.

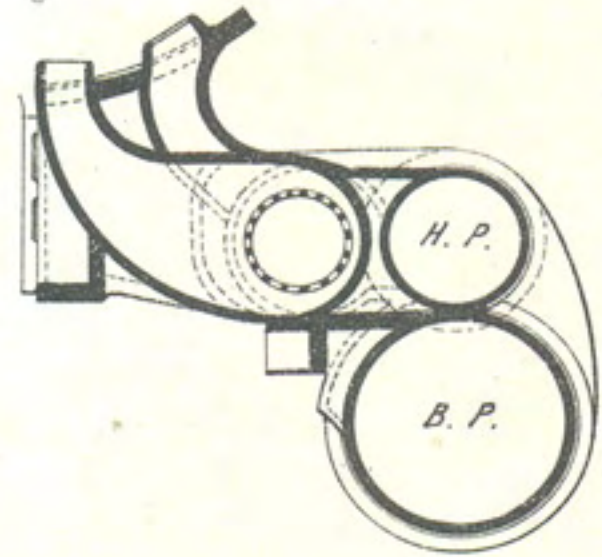


Fig. 3. COUPE EN LONG CHAPELLE ET TIRDIR CYLINDRIQUE.

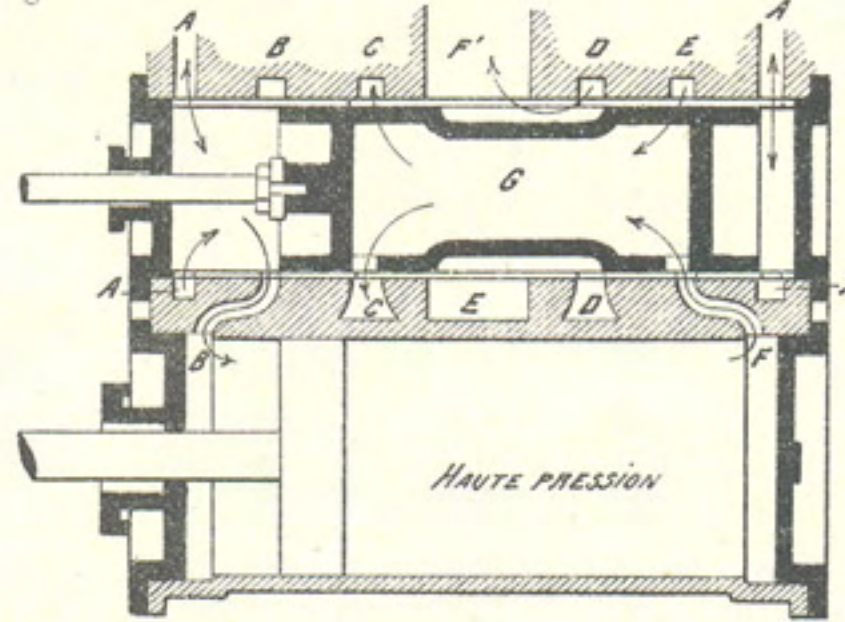


Fig. 3 bis. COUPE EN LONG DU TIRDIR.

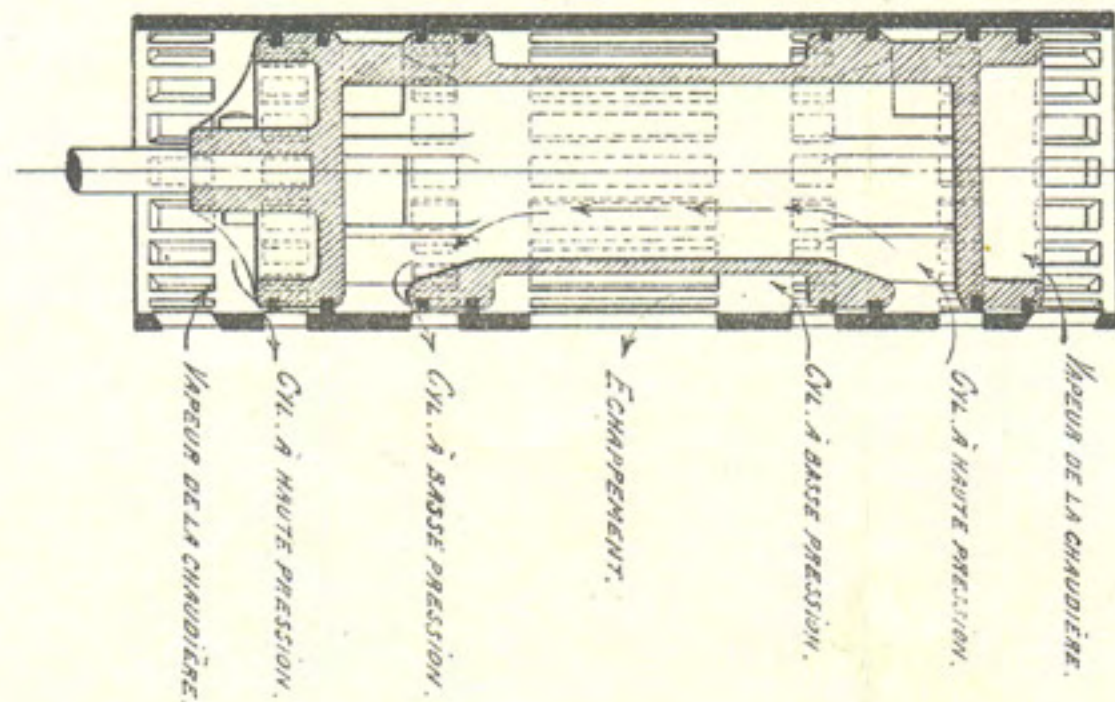


Fig. 4. Coulisse de Stephenson, barres droites.

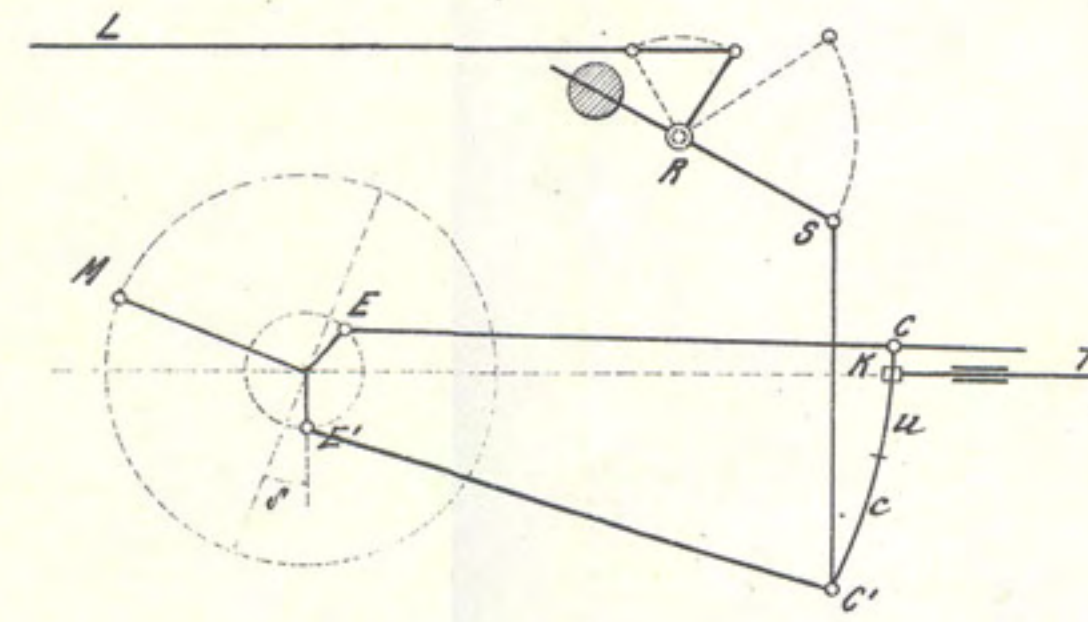


Fig. 5. Coulisse de Stephenson, barres croisées.

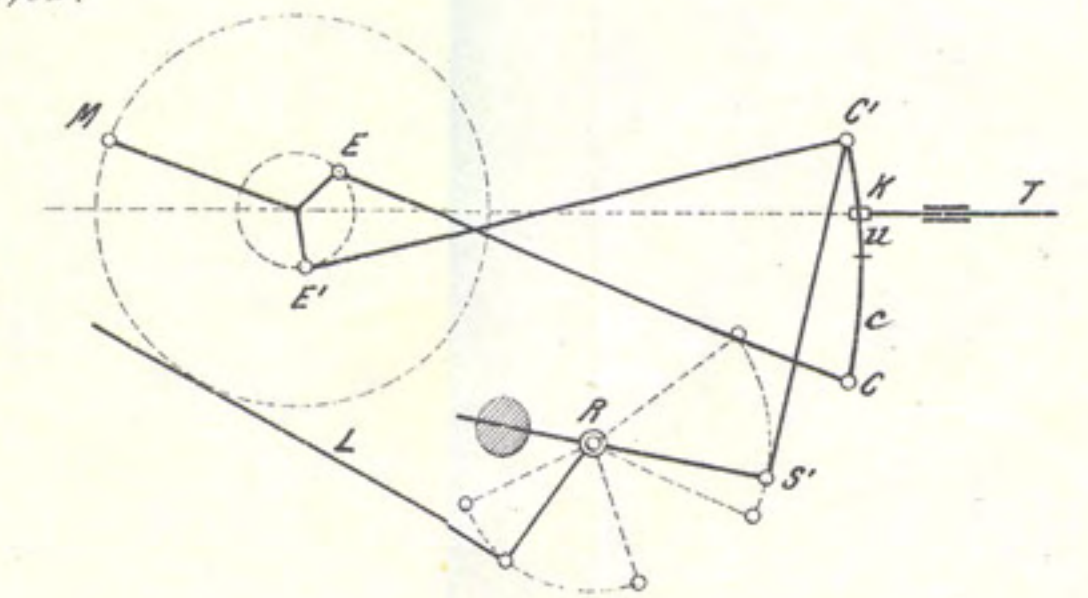


Fig. 7. Coulisse de Gooch.

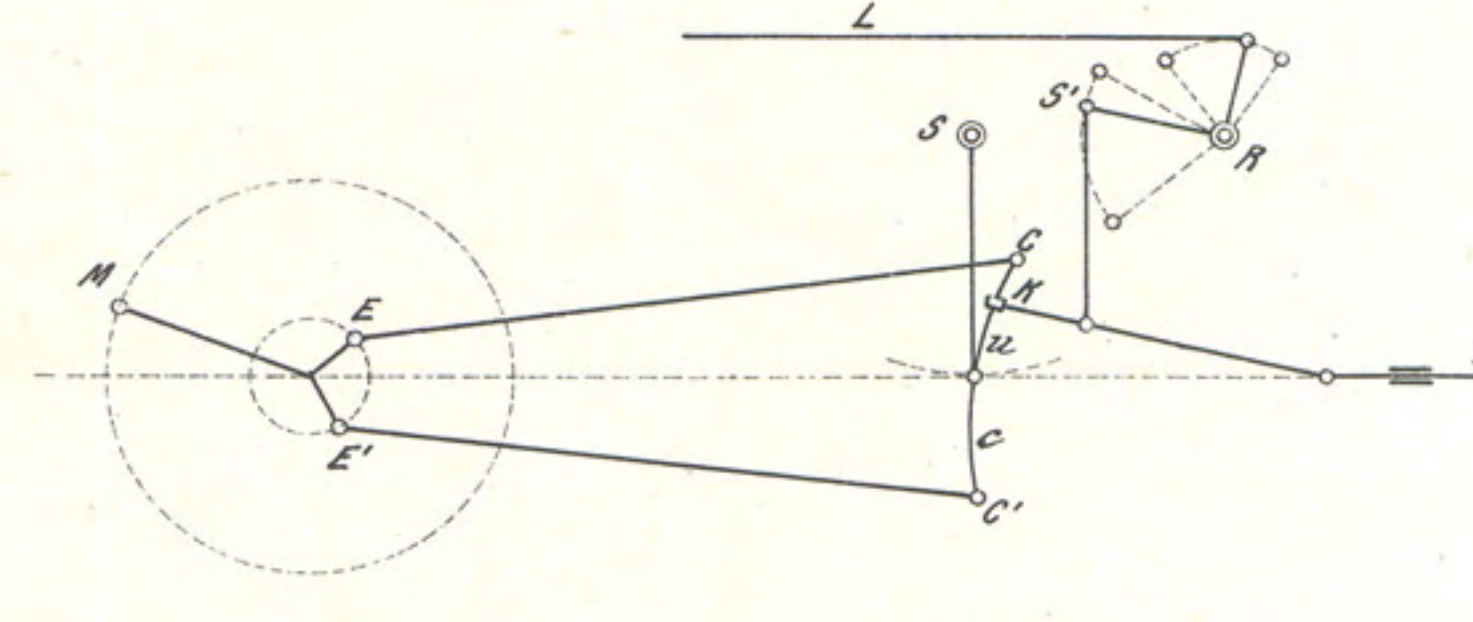


Fig. 8. Coulisse droite d'Allan.

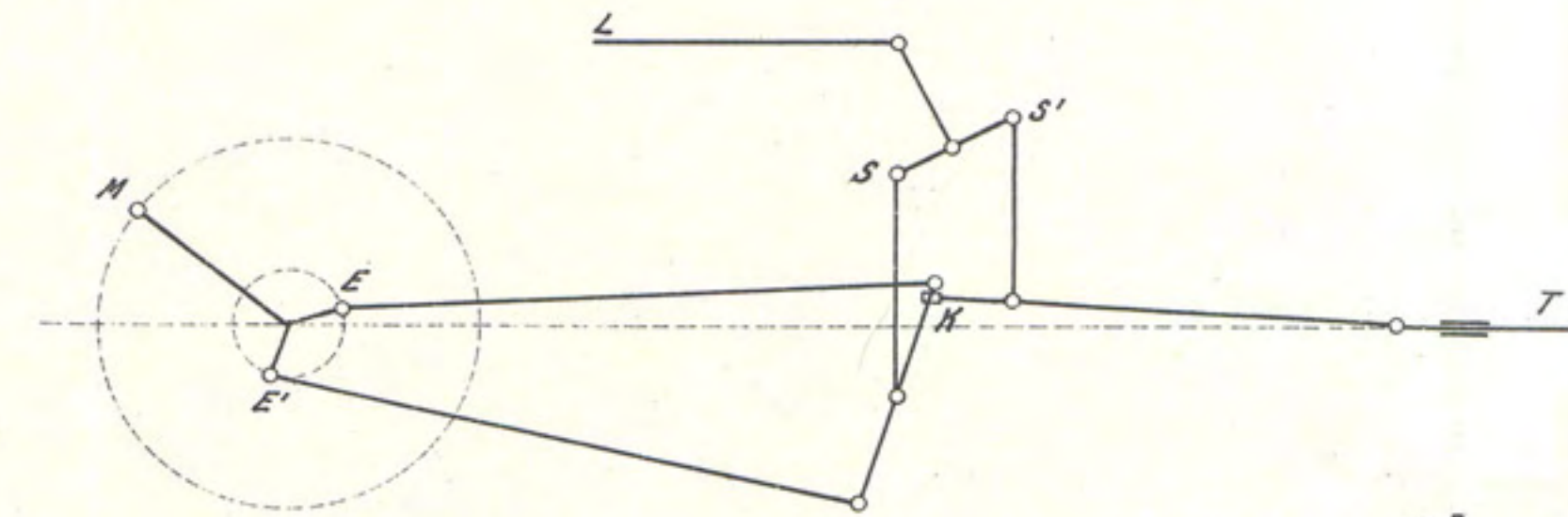
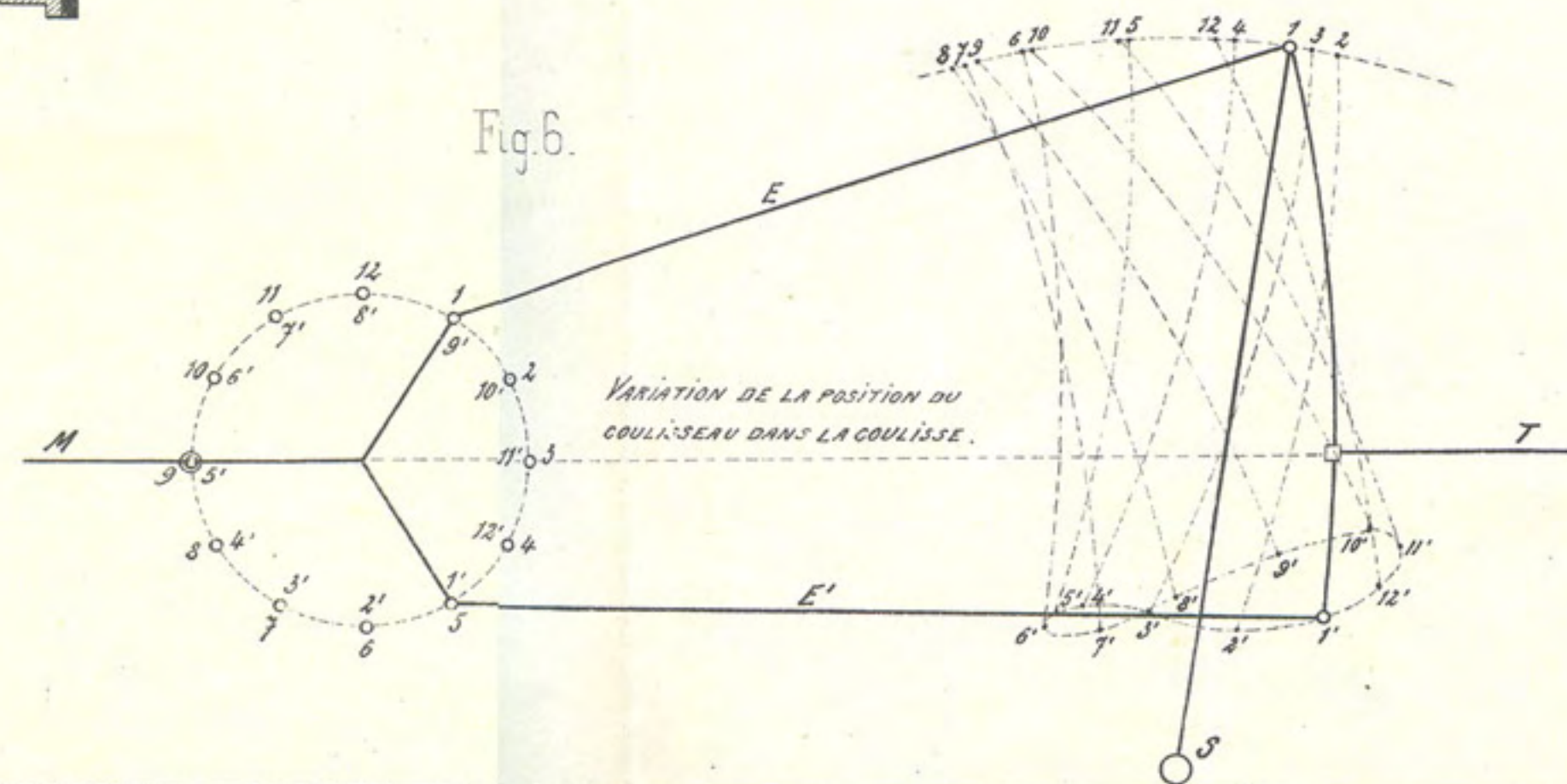
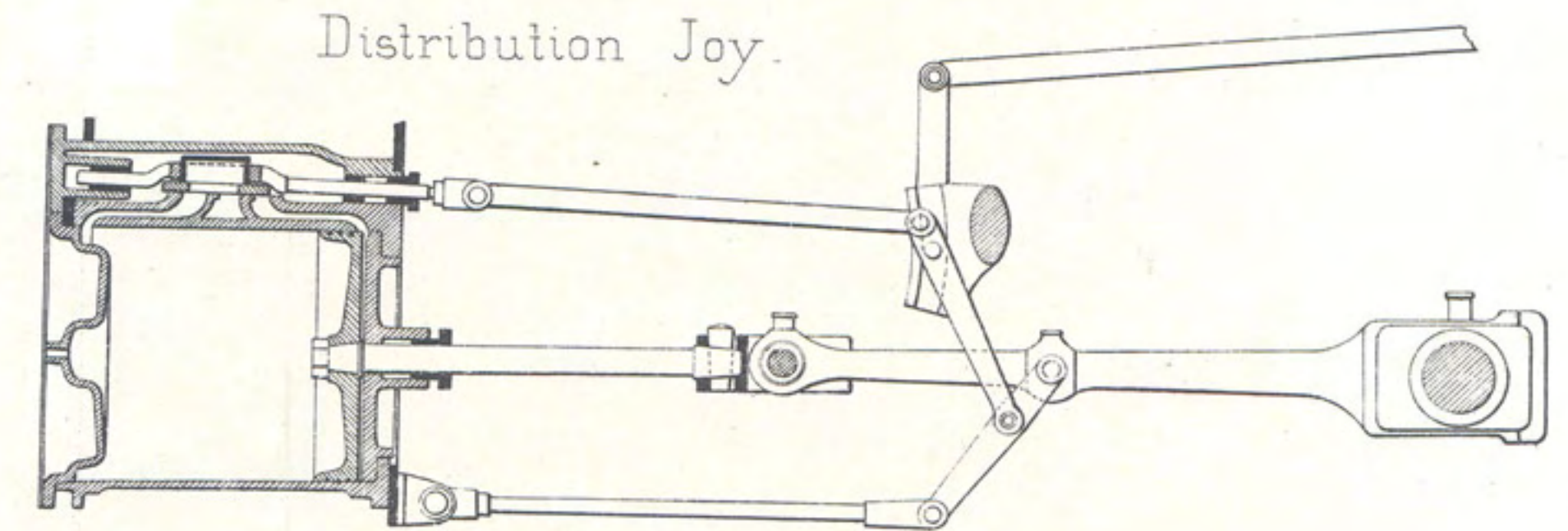


Fig. 6.



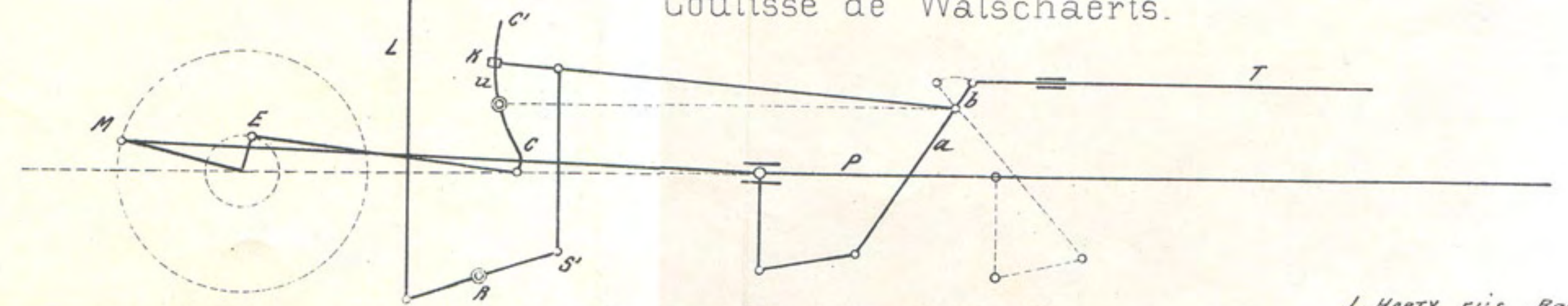
VARIATION DE LA POSITION DU COULISSEU DANS LA COULISSE.

Fig. 11.



Distribution Joy.

Fig. 9.



Coulisse de Walschaerts.

Distribution Stevart.

Fig. 10.

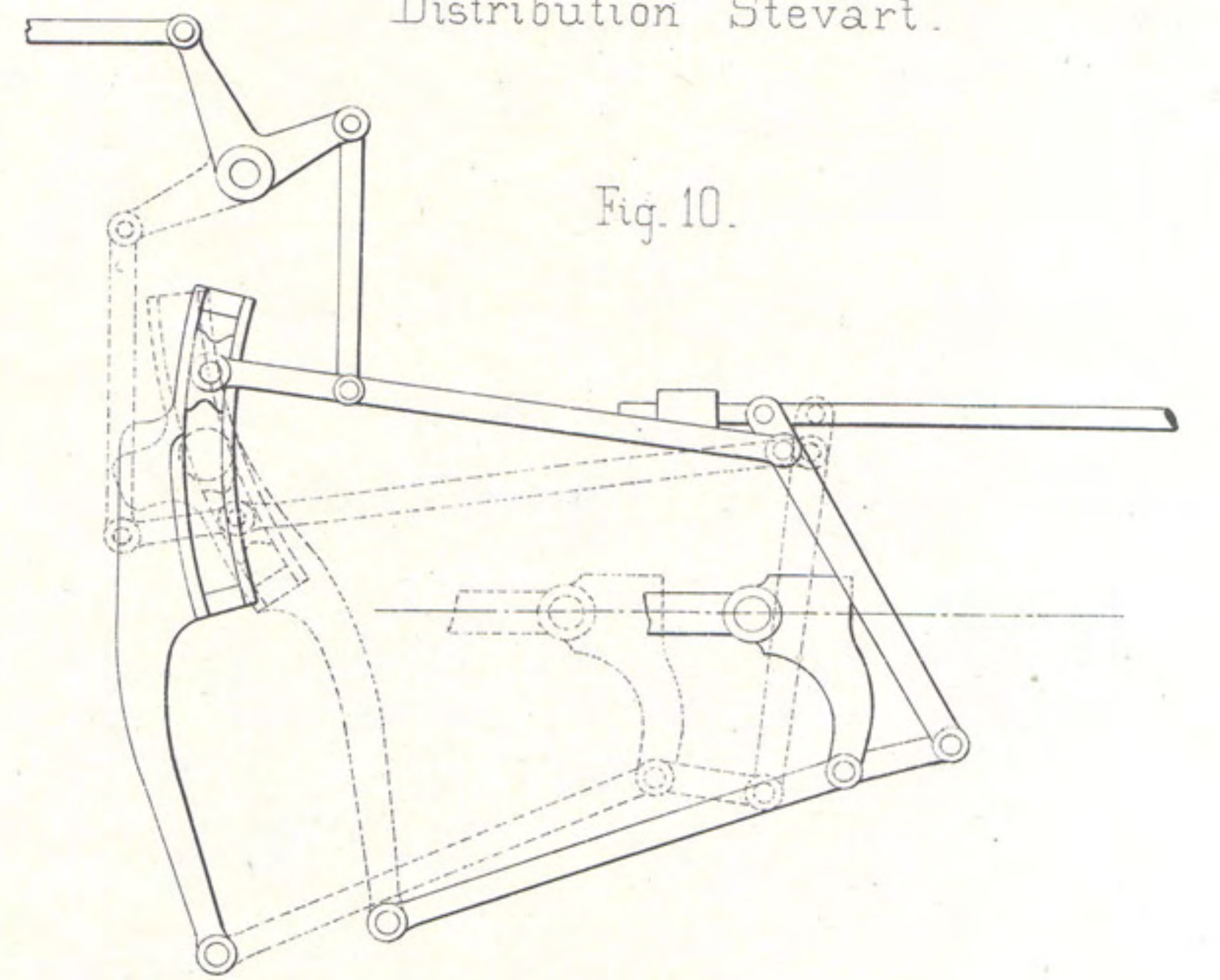


Fig. 1. Tiroirs cylindriques.

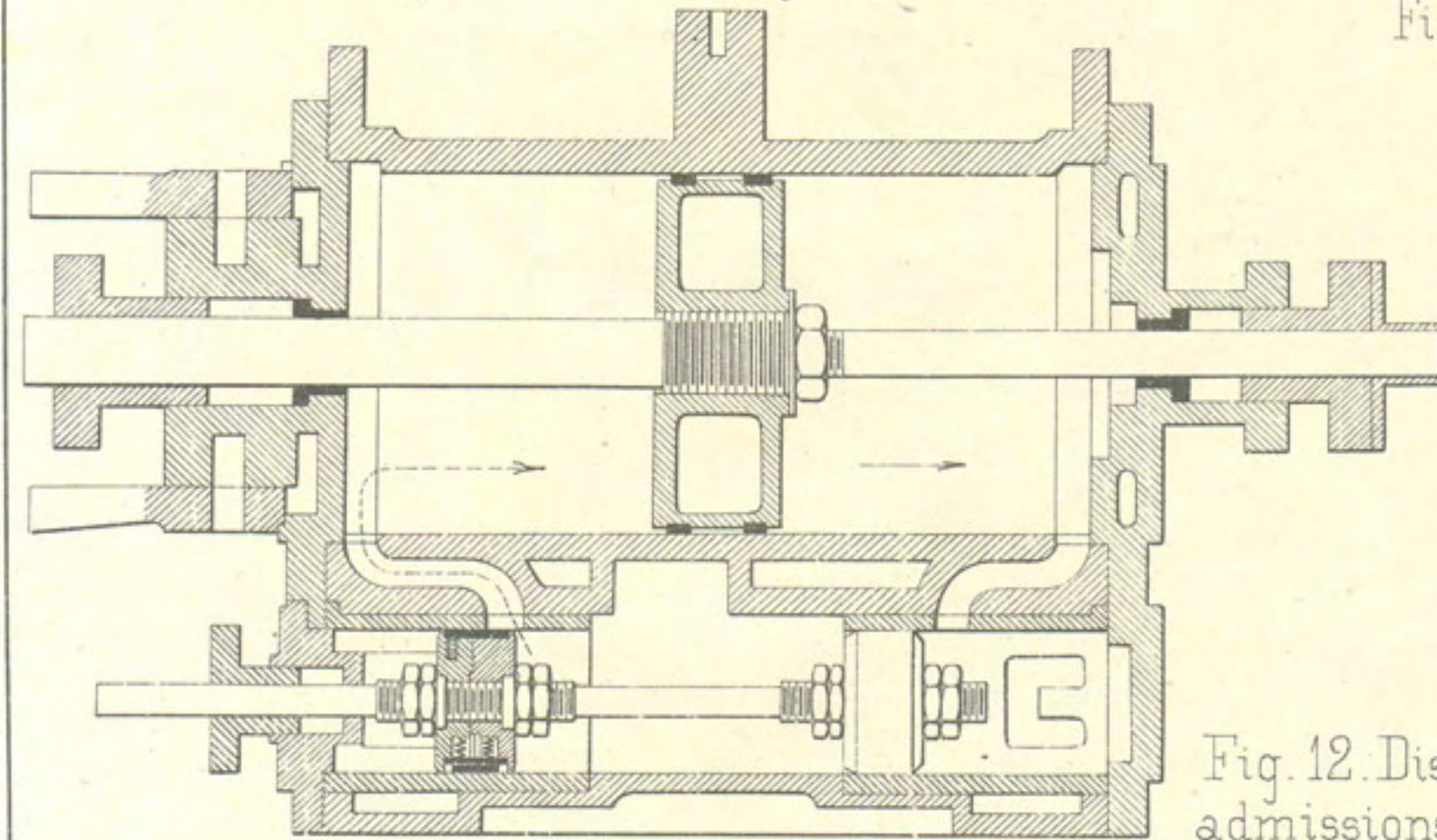
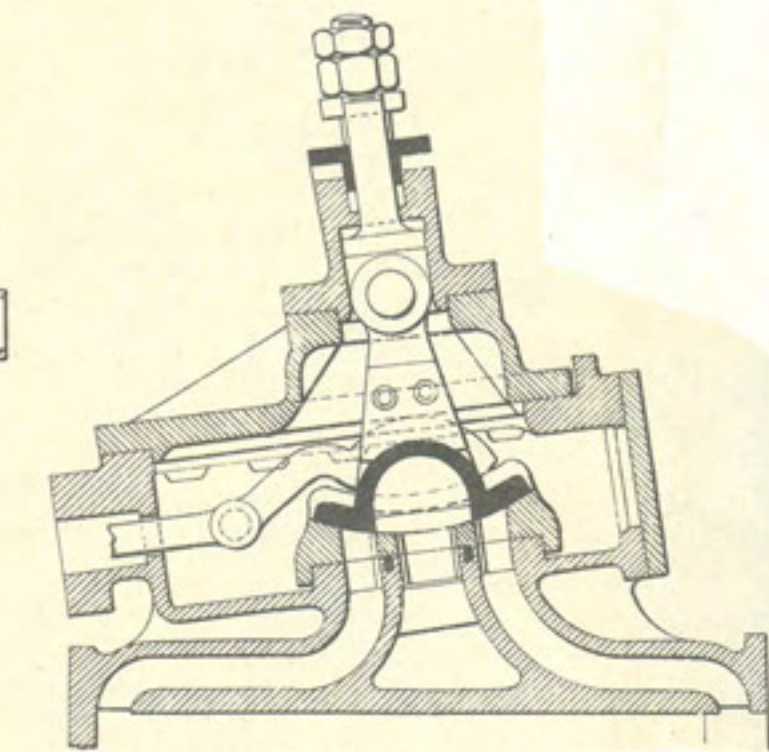


Fig. 2. Tiroir pendule de Duheil.



Levier de changement de marche à crans

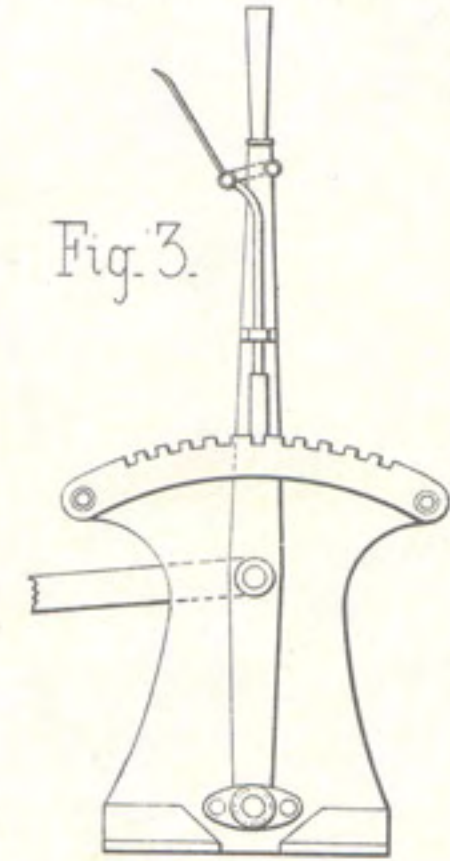


Fig. 3.

Fig. 4. Levier à vis de Belpaire.

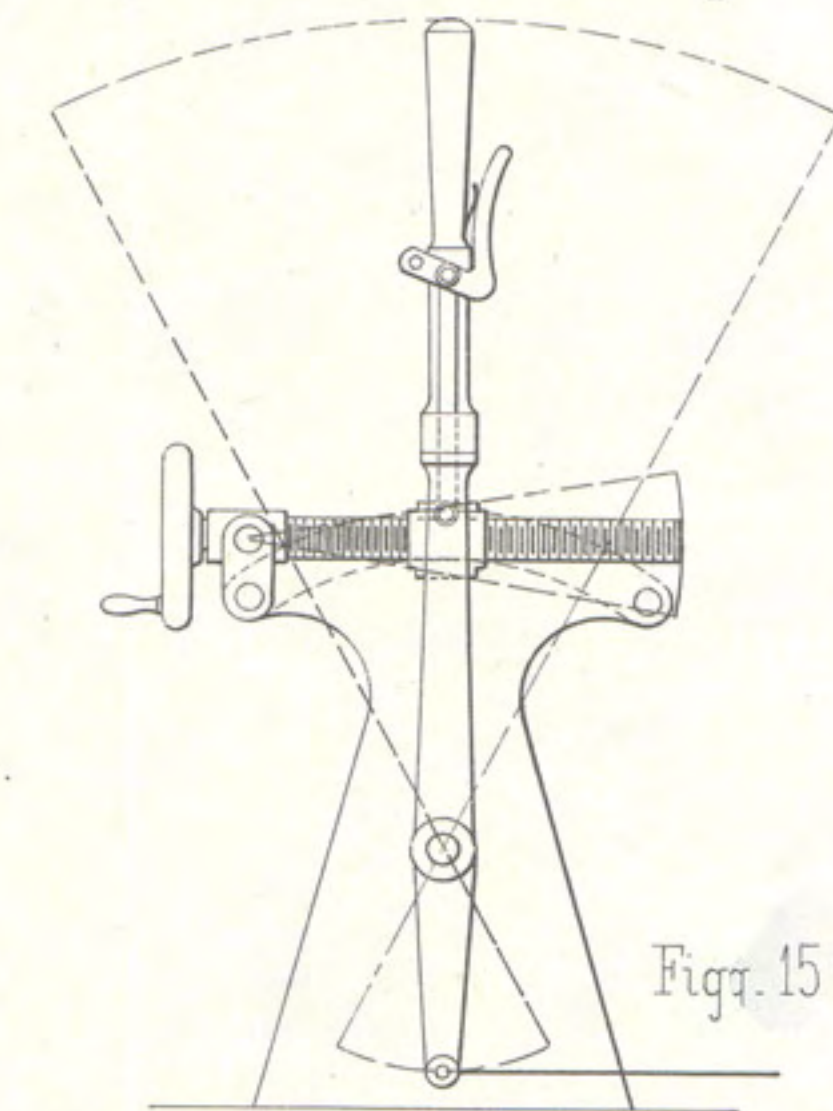
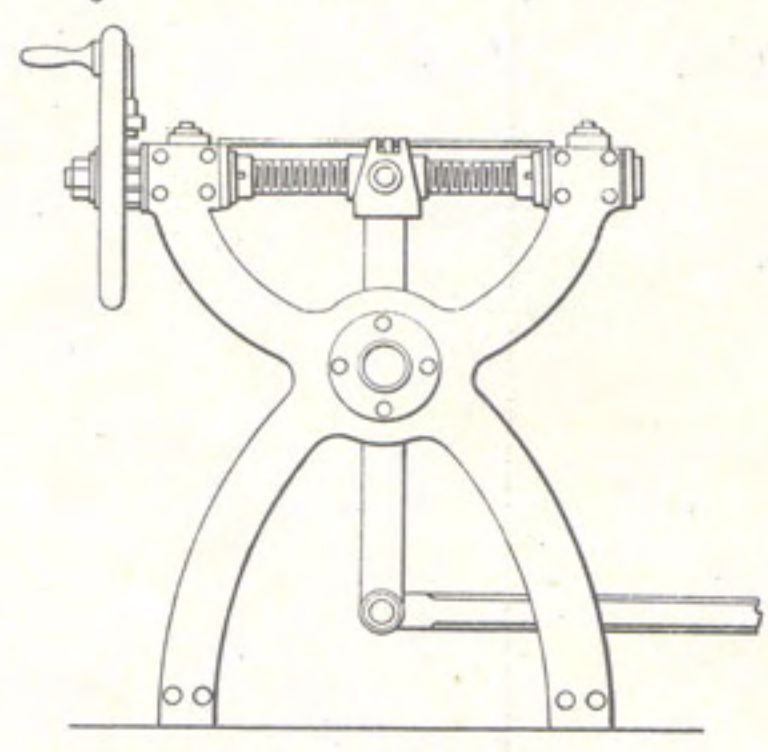


Fig. 5. Levier à vis fixe.



Levier à vis fixe de Kitson. Fig. 7. Levier à vapeur de Stirling.

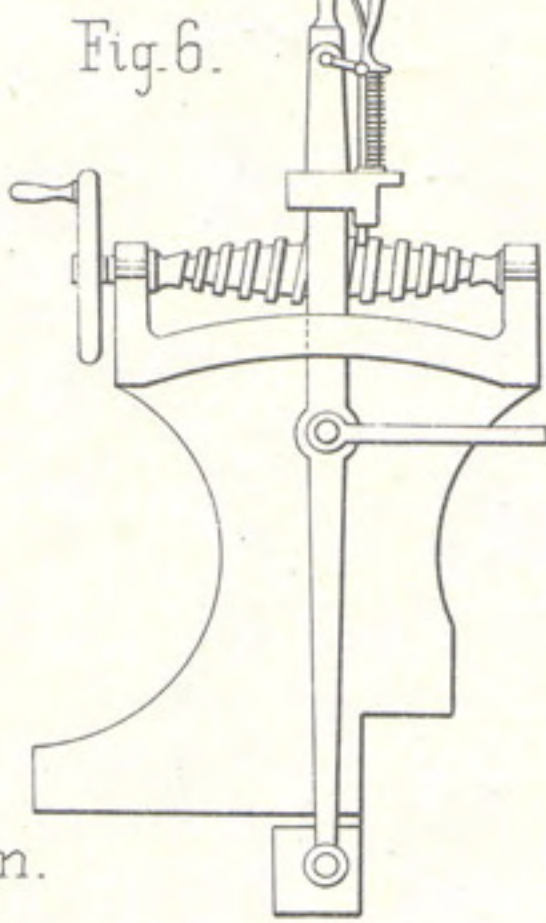


Fig. 6.

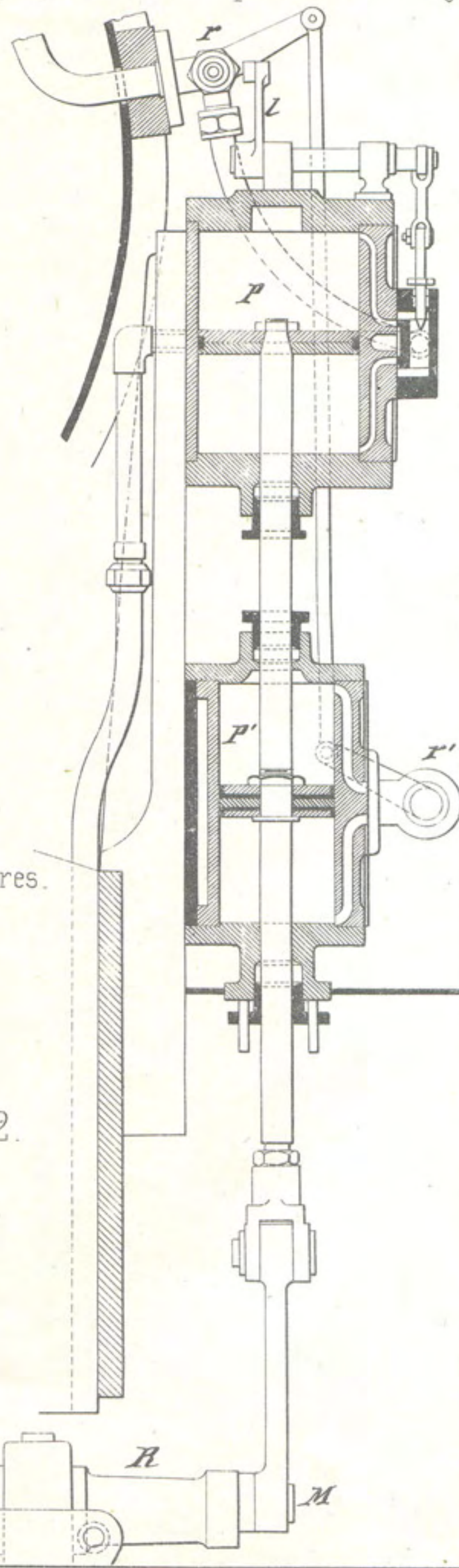


Fig. 12. Dispositif de Mallet pour donner des admissions différentes aux deux cylindres.

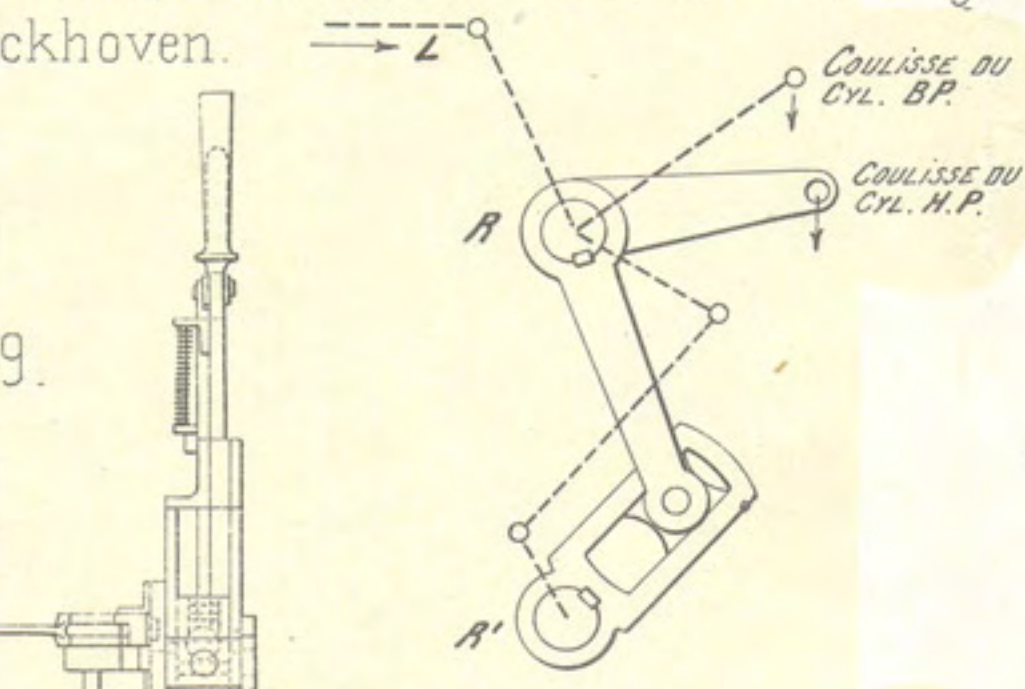


Fig. 8 à 11. Levier à main et à vapeur de Verboeckhoven.

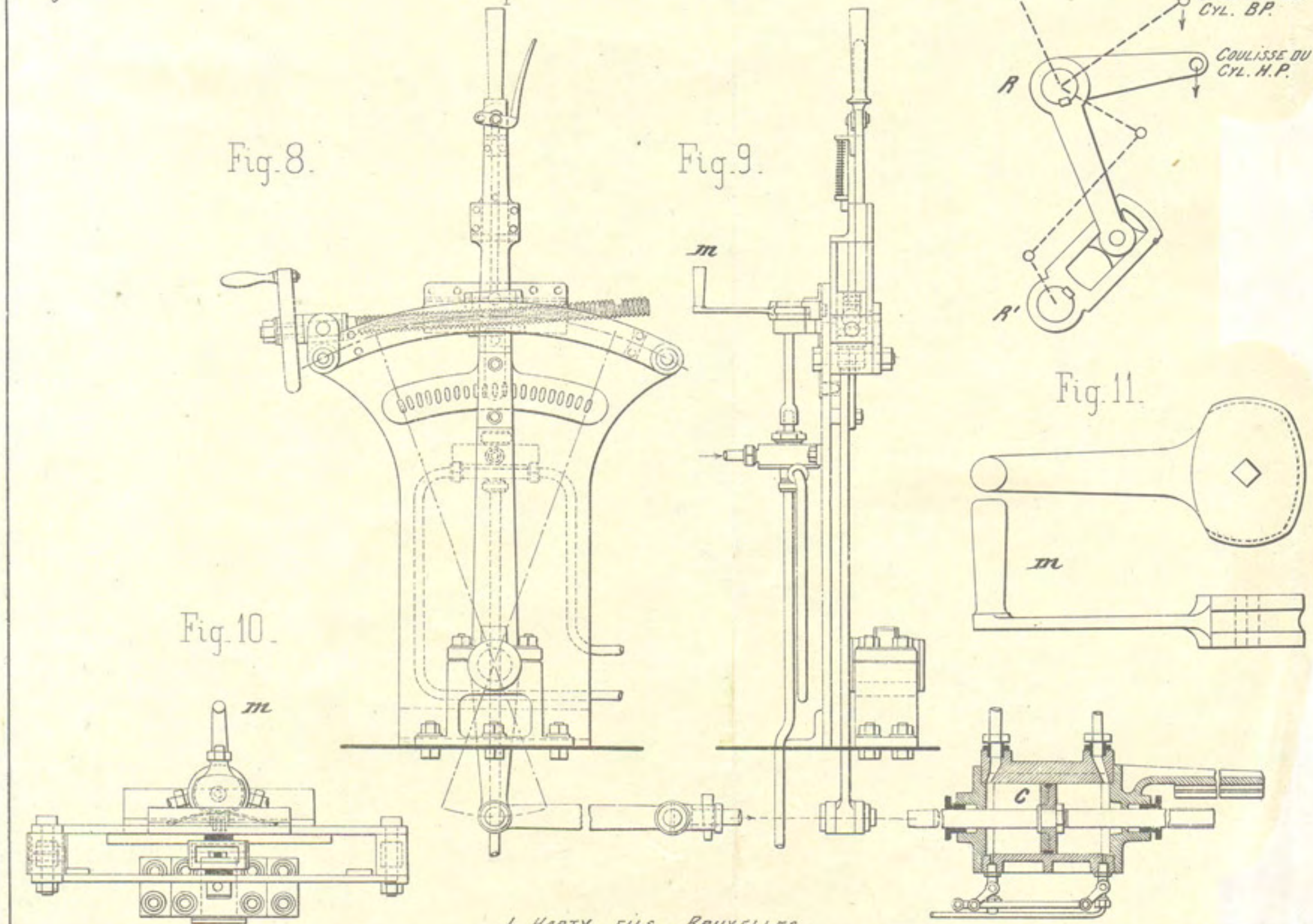


Fig. 13 et 14. Changement de marche des Compound express du P.L.M.

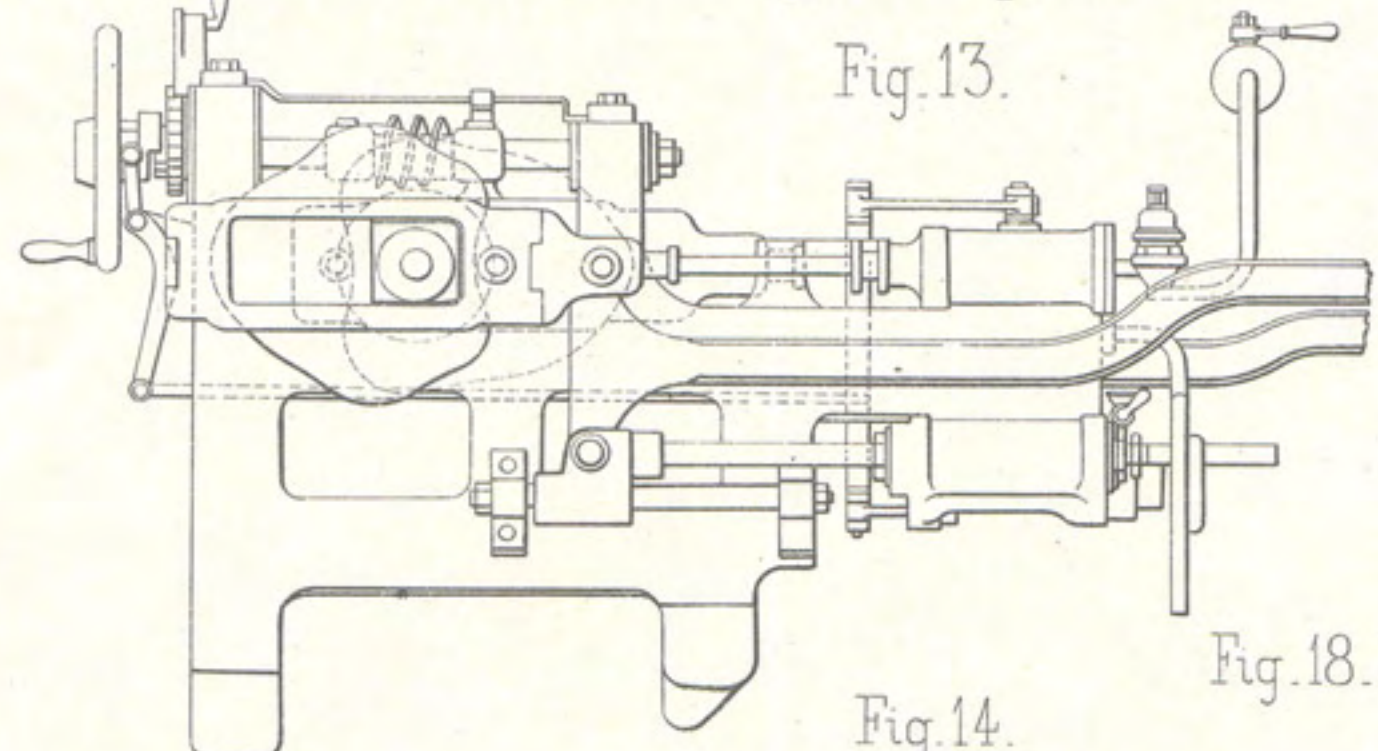


Fig. 15 et 16. Piston à ressorts de Stephenson.

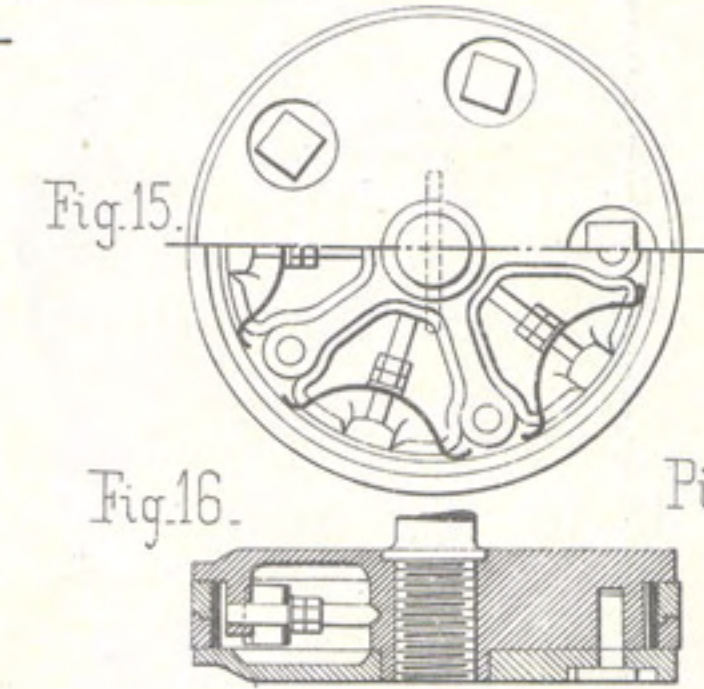


Fig. 20. Piston suédois.

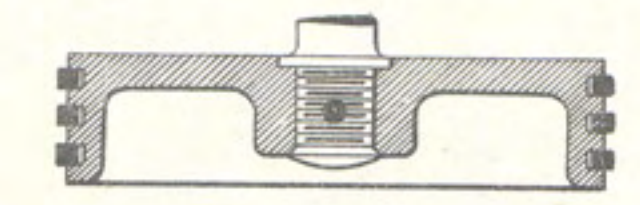


Fig. 21. Piston suédois assemblé à sa tige par rivures.

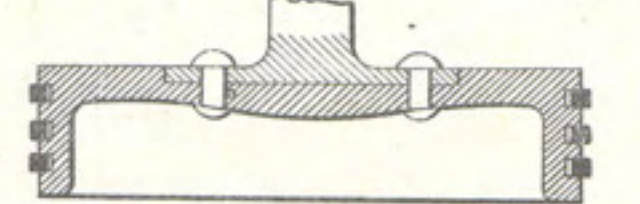


Fig. 22 et 23. Cercle de piston

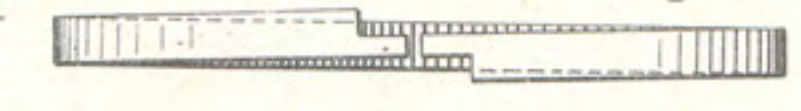
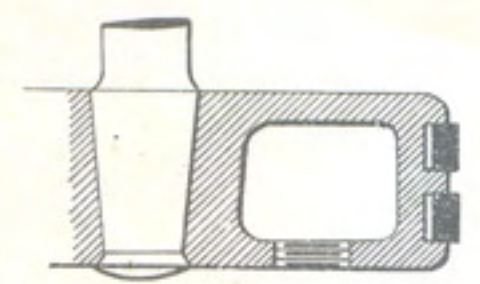


Fig. 18. Piston en fonte sans ressorts.



Piston en acier sans ressorts.

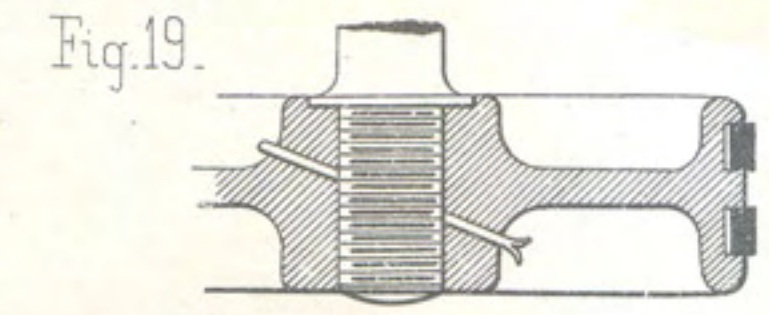


Fig. 17. Piston à ressort américain.

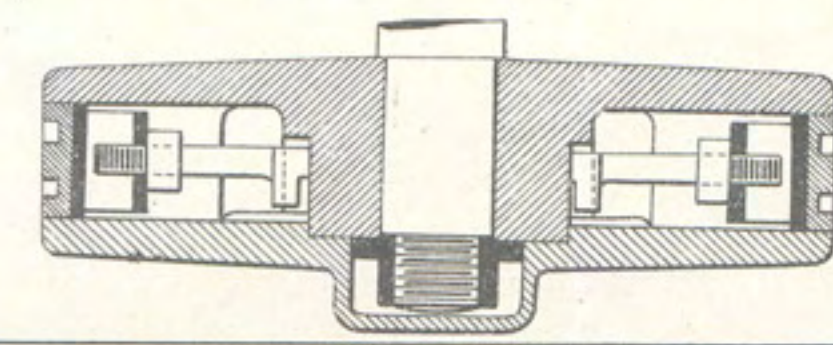


Fig. 1 à 4. Crossette à 4 guides (M<sup>ne</sup> à voyageurs Etat-Belge). Ech. 1:10.

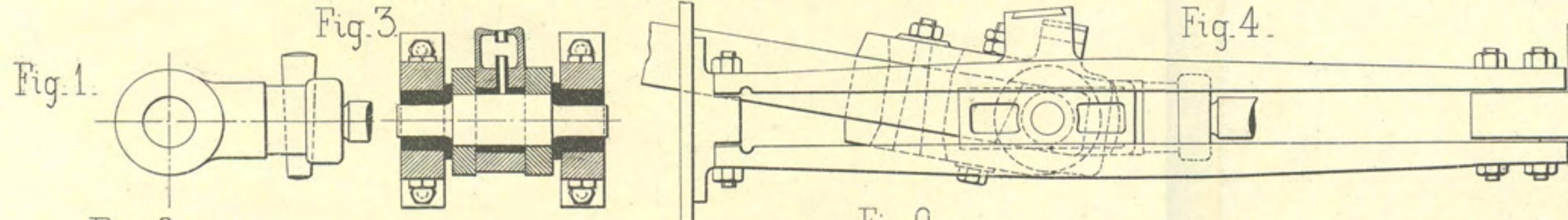


Fig. 13 et 13<sup>bis</sup>. Bielle motrice Loc. fourgon E-B.

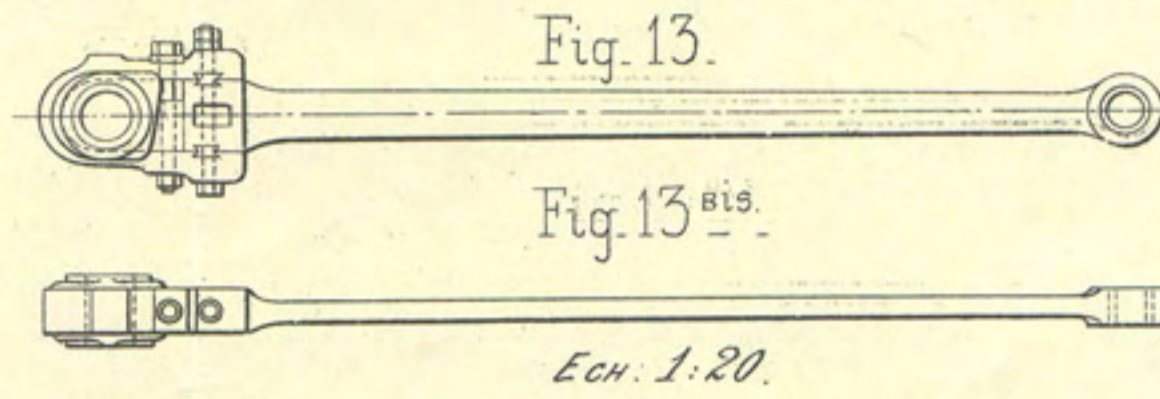


Fig. 22 et 23 Essieu coudé March<sup>s</sup> E.B.

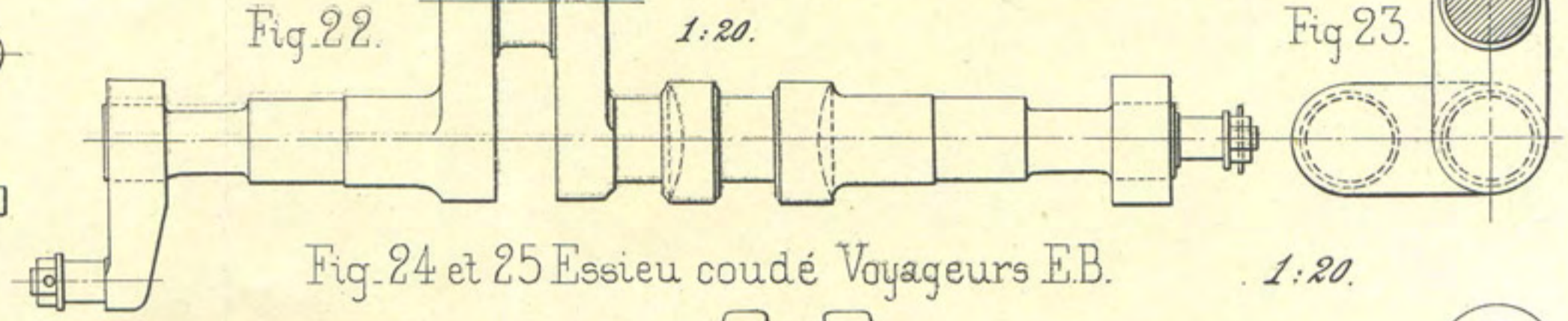


Fig. 8. Crossette à 1 seul guide creux de Dean. Crossette à 1 seul guide Loc. de banlieue de l'Ouest.

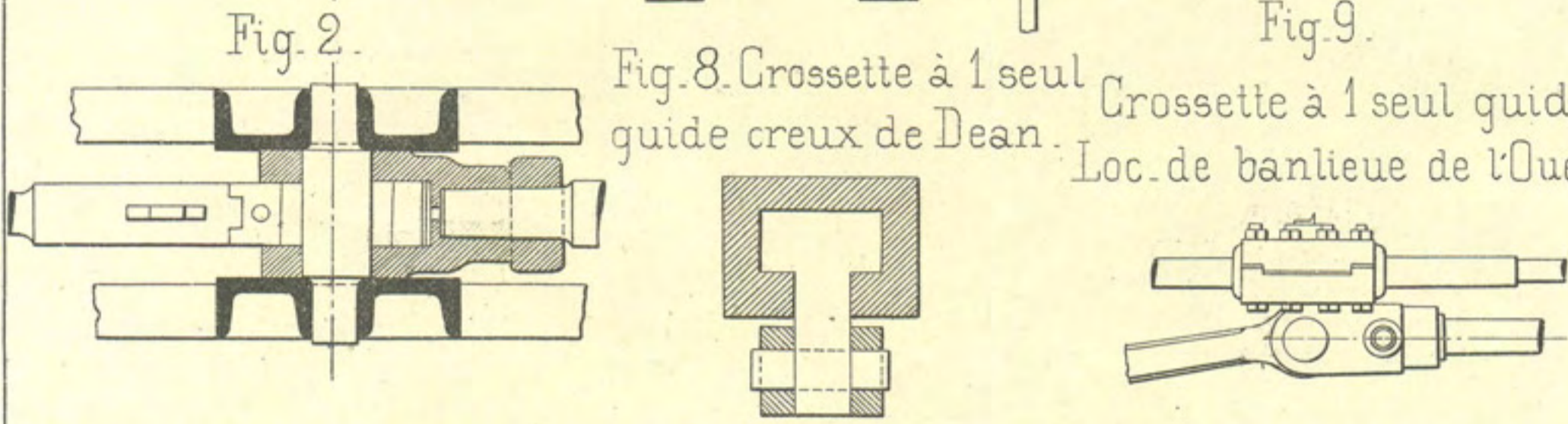


Fig. 14 et 15. Bielle motrice forte rampe - E-B. 1:20.

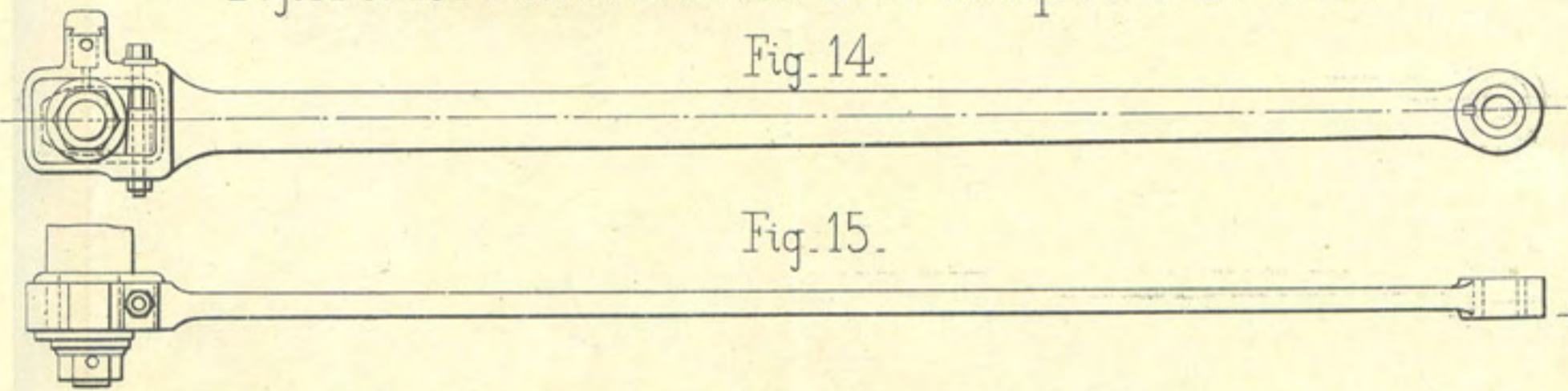


Fig. 24 et 25 Essieu coudé Voyageurs E.B.

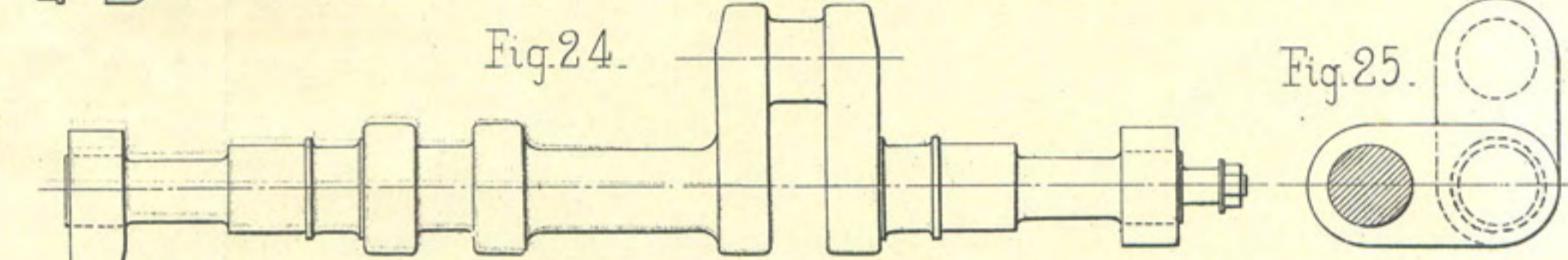


Fig. 5 et 6. Crossette américaine à 4 guides. Fig. 7. Crossette à 2 guides des Loc. fortes rampes de l'Etat Belge.

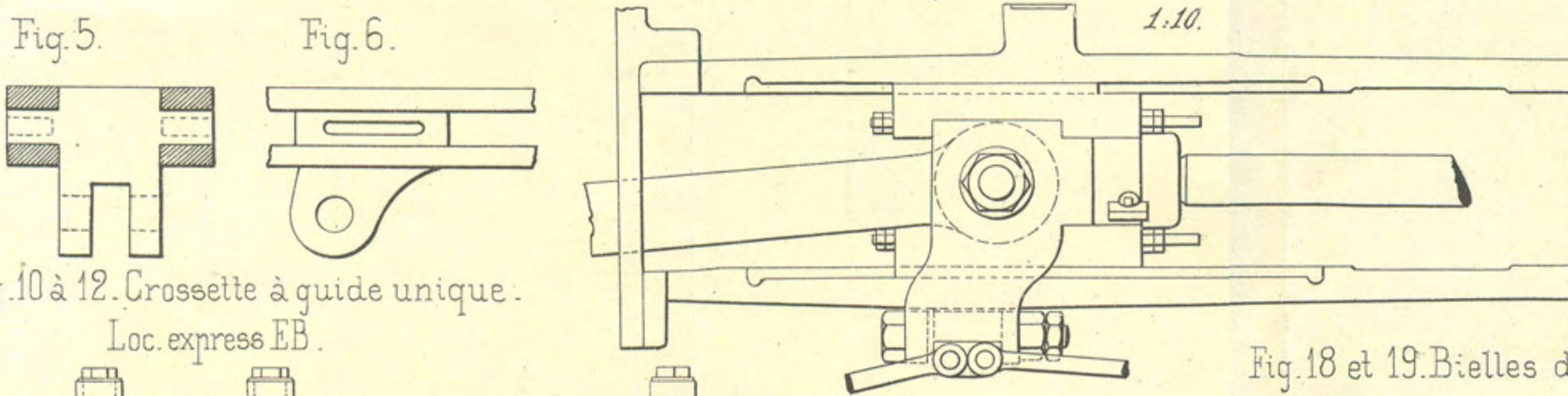


Fig. 16 et 17. Bielle motrice March<sup>s</sup> E.B. 1:20.

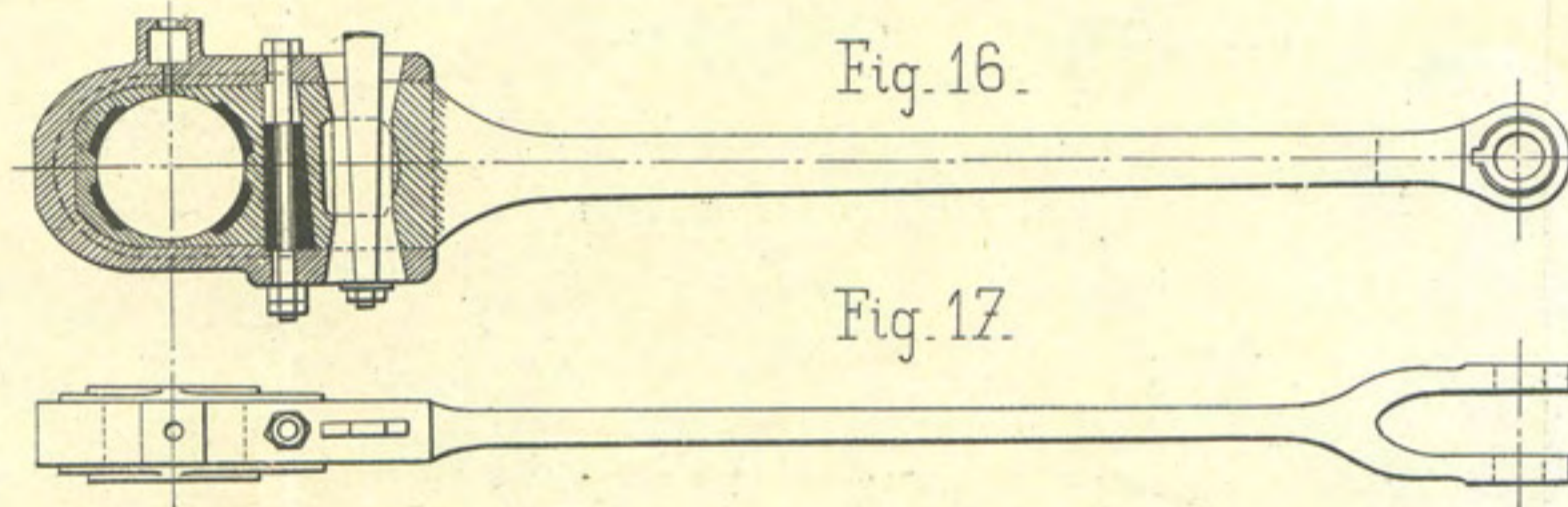


Fig. 26 et 27 Essieu coudé à palettes circulaires - Compound Nord.

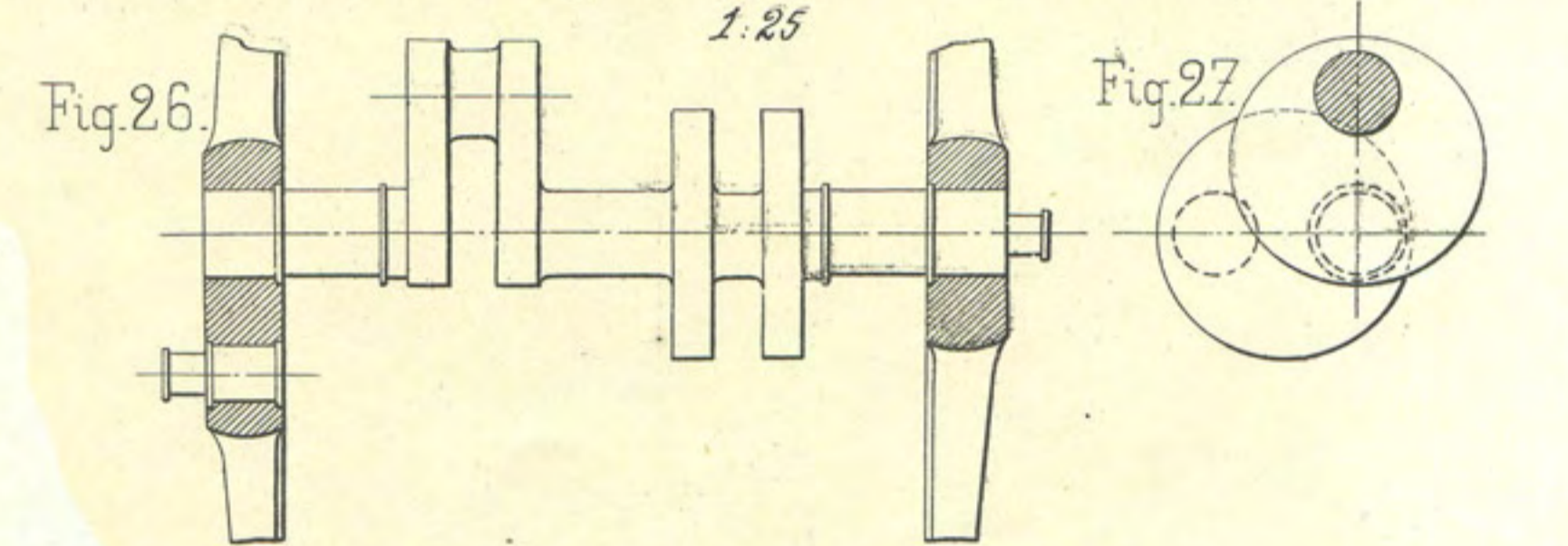


Fig. 10 à 12. Crossette à guide unique. Loc. express EB.

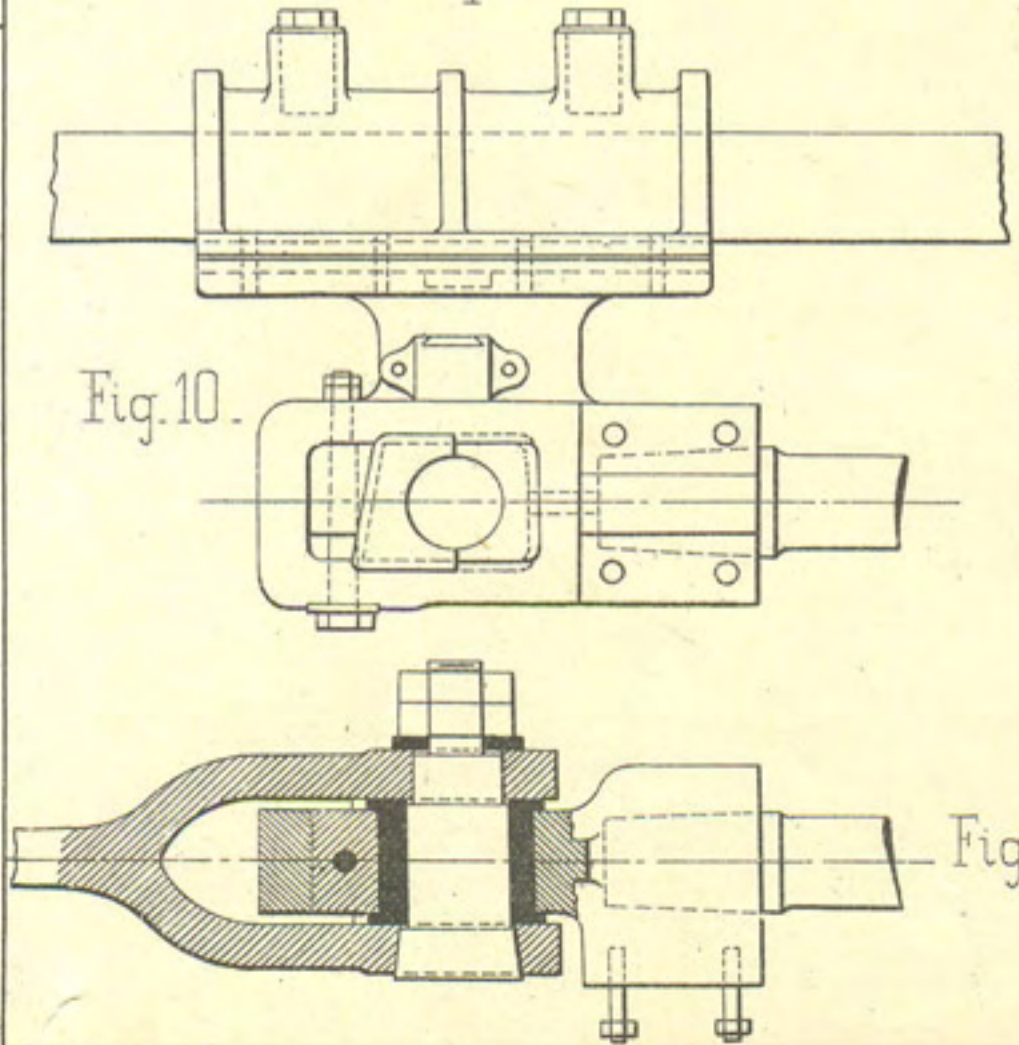


Fig. 18 et 19. Bielles d'accouplement des March<sup>s</sup> E.B. 1:20.

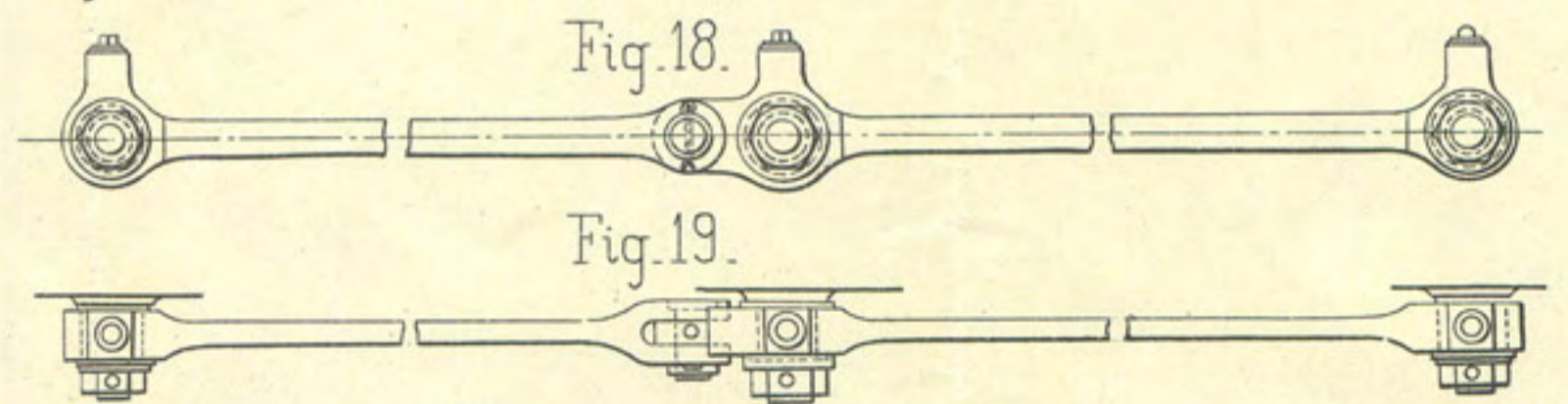


Fig. 28 et 29. Essieu coudé fretté de l'Ouest.

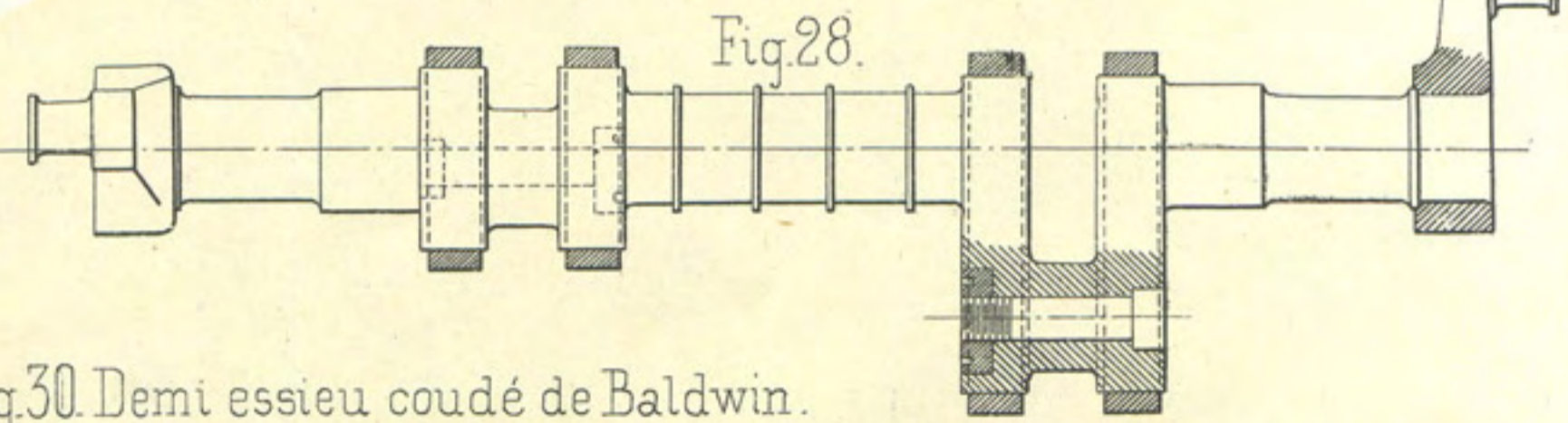


Fig. 21. Manivelle de Hall.

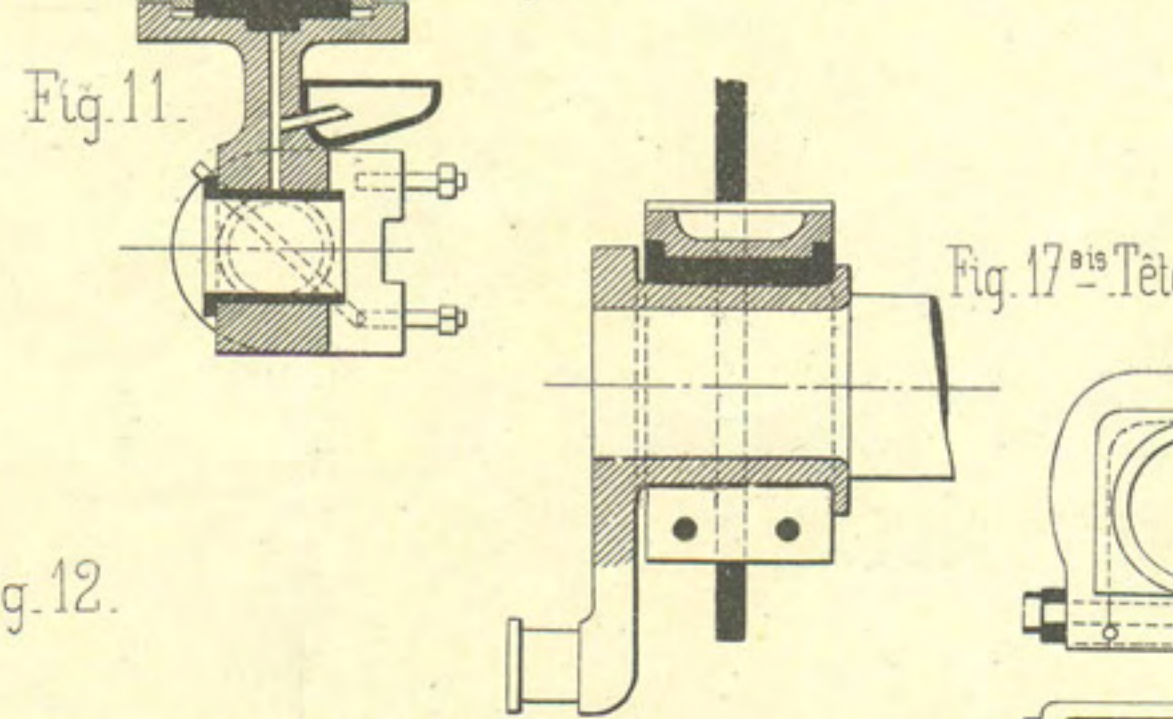


Fig. 17<sup>bis</sup>. Tête de bielle de la M<sup>ne</sup> Klose de l'Etat de Wurtemberg.

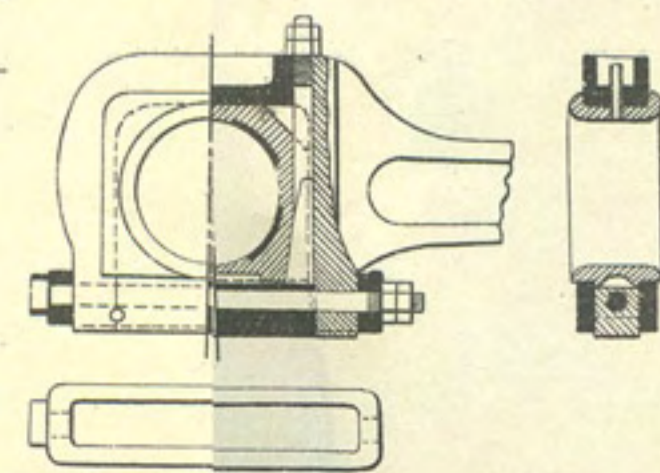


Fig. 20. Essieu droit et manivelle d'accouplement.

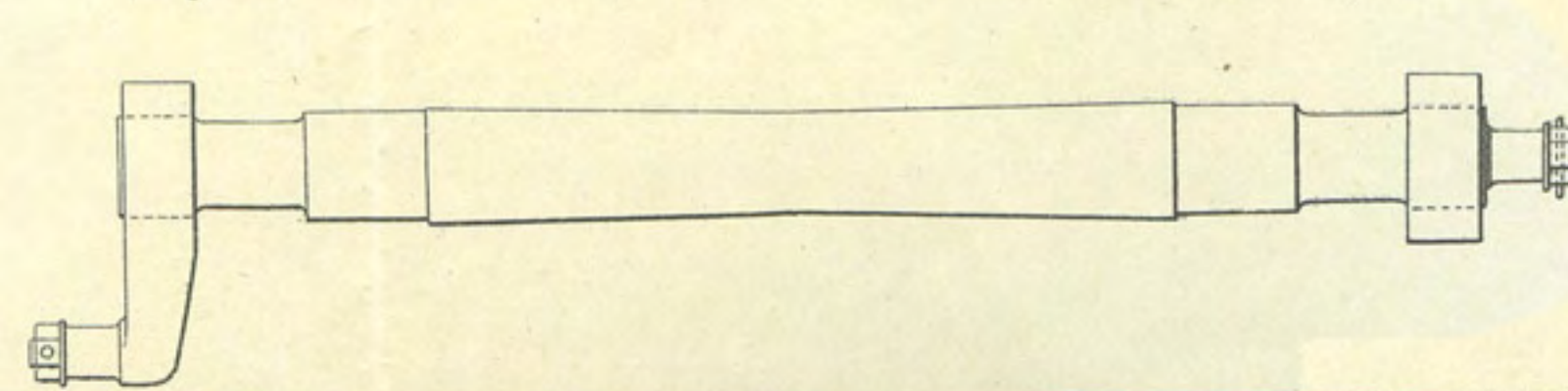


Fig. 30. Demi essieu coudé de Baldwin.

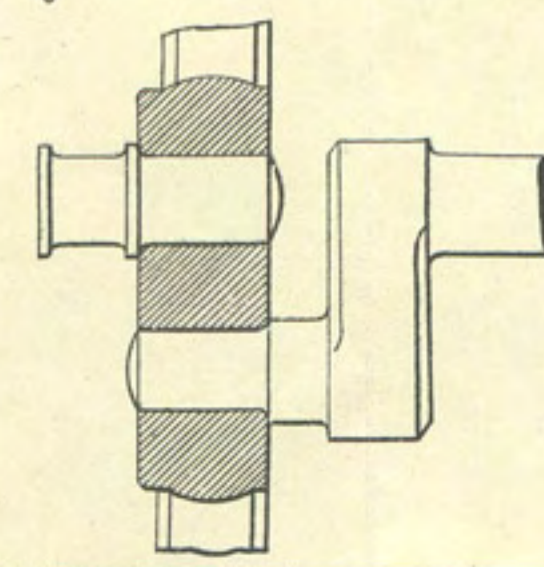


Fig. 31. Essieu coudé a palettes obliques.

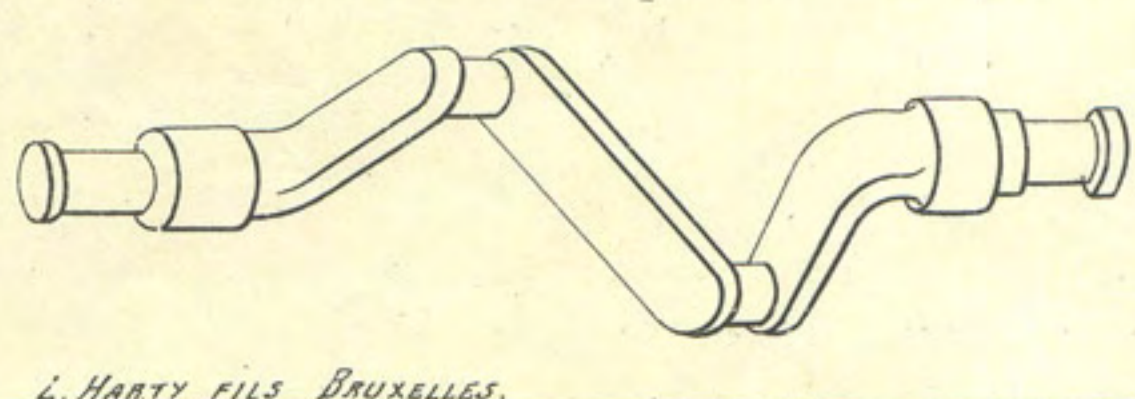


Fig. 1 et 2. Roue motrice de 2<sup>m</sup> de diamètre.

Fig. 5 et 6. Roue manivelle à plateau.

Bandage de Loc. américaine

Bandage de Loc. Etat-Belge.

Fig. 15 et 16. Boite avec suspension inférieure.

Fig. 17 et 18. Boite à 3 coussinets Raymond et Henrard.

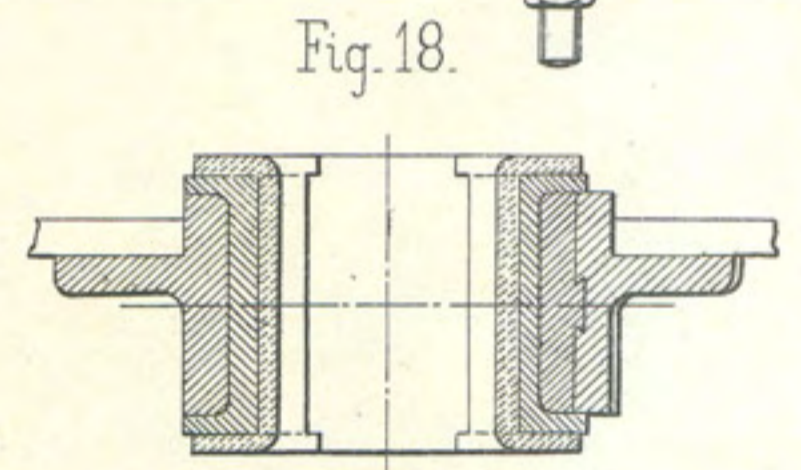
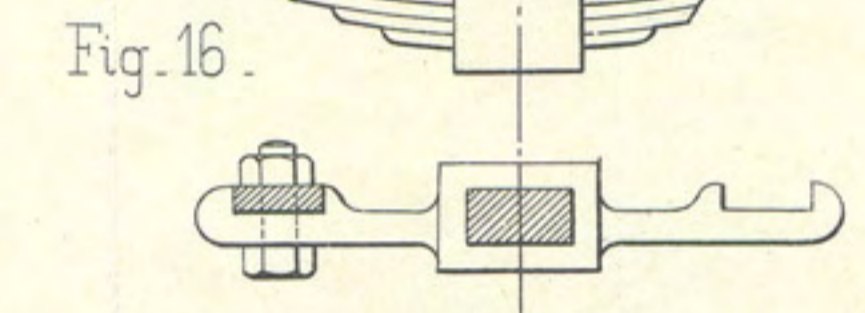
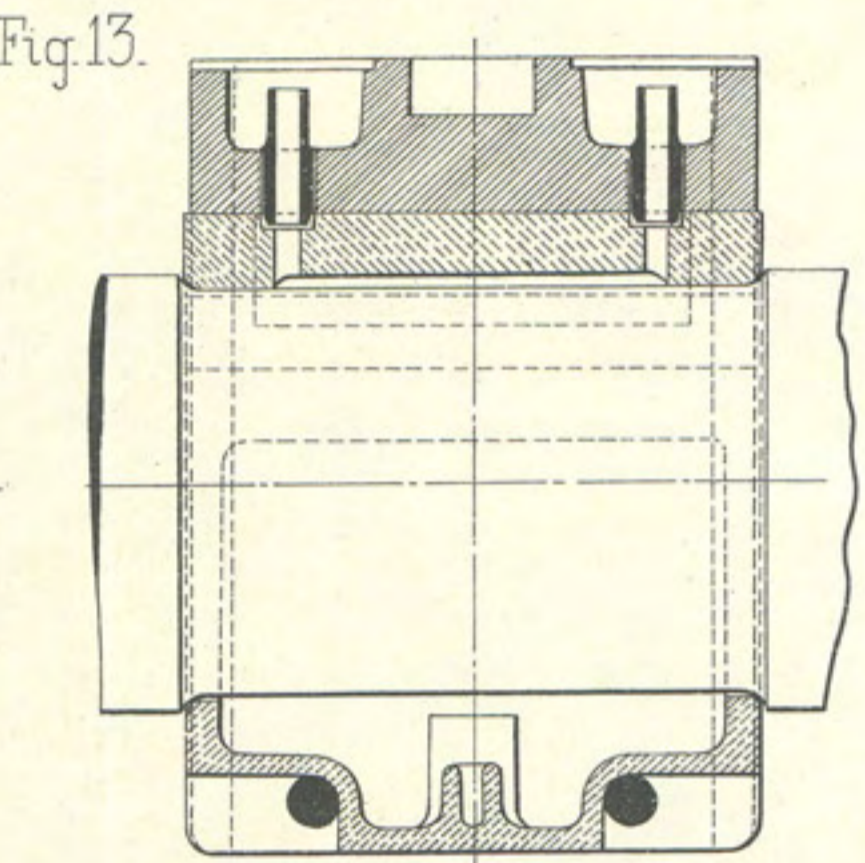
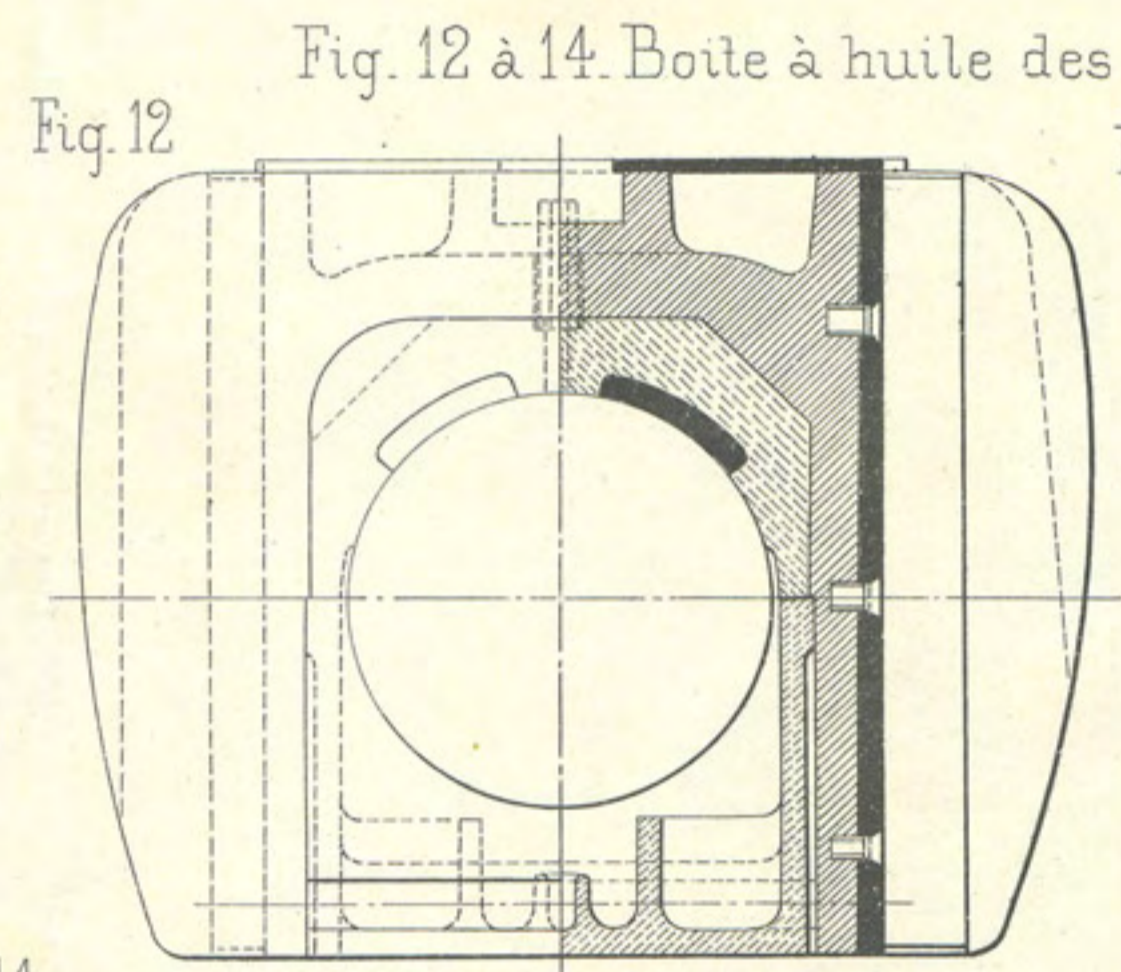
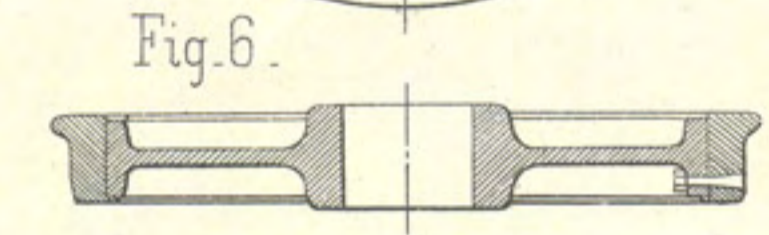
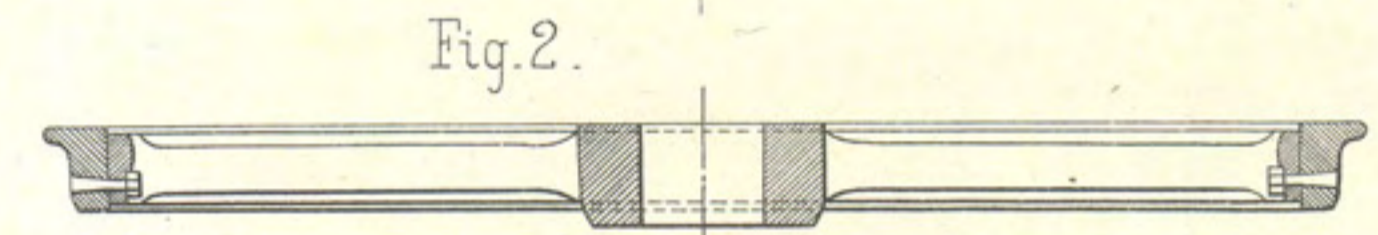
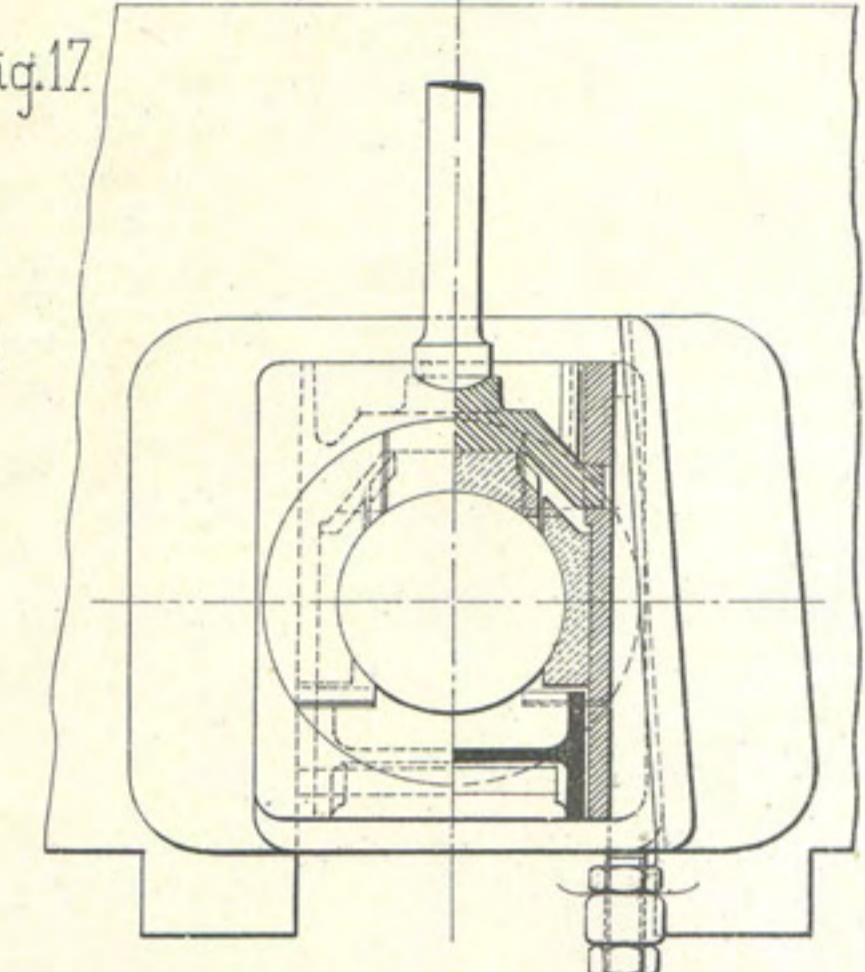
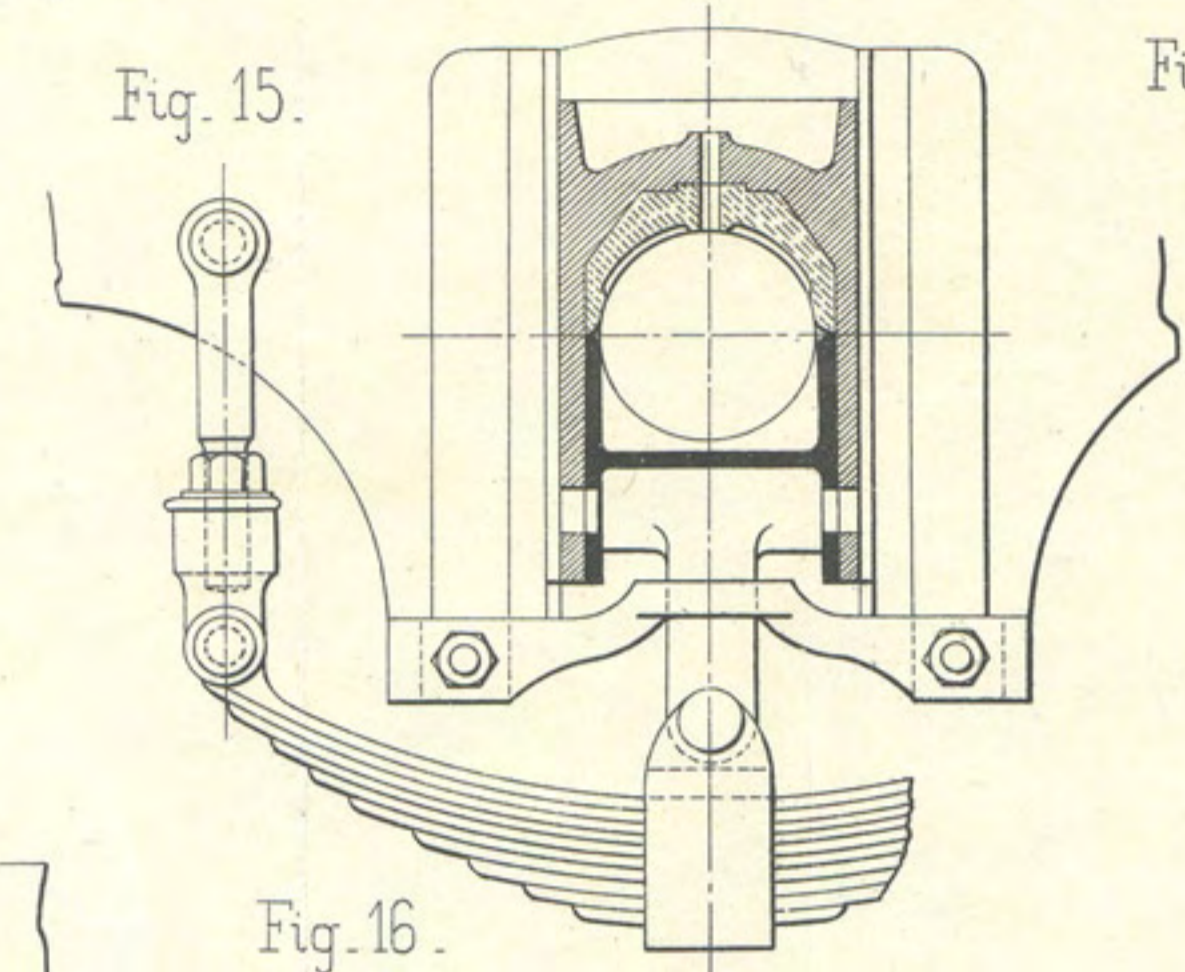
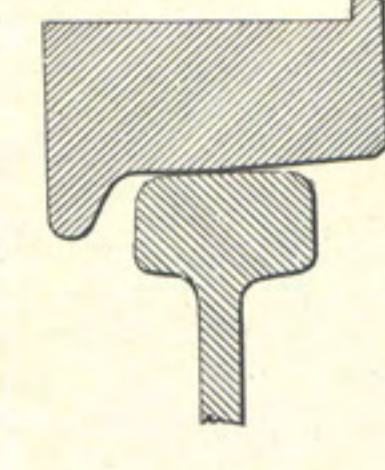
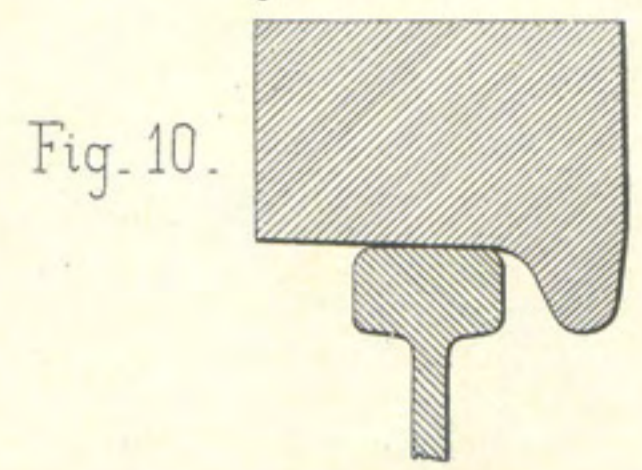
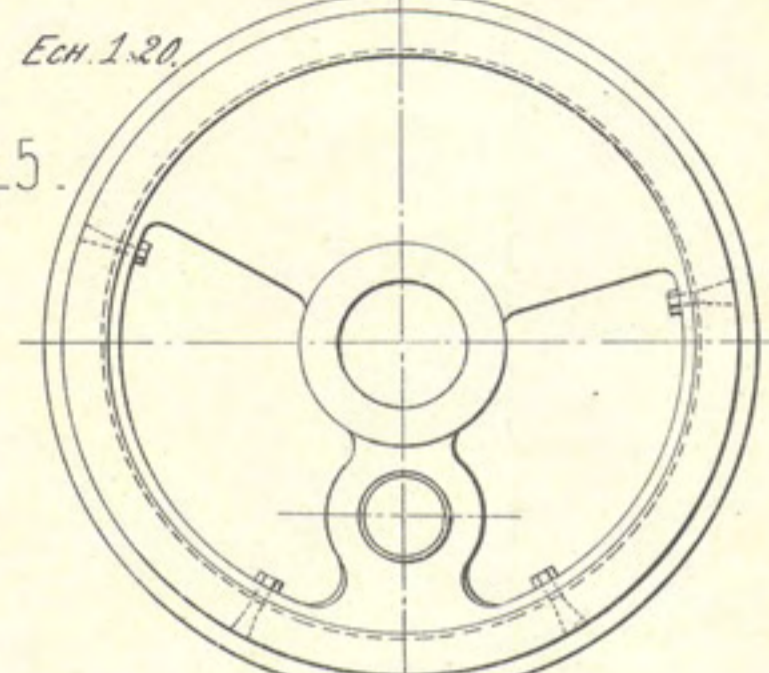
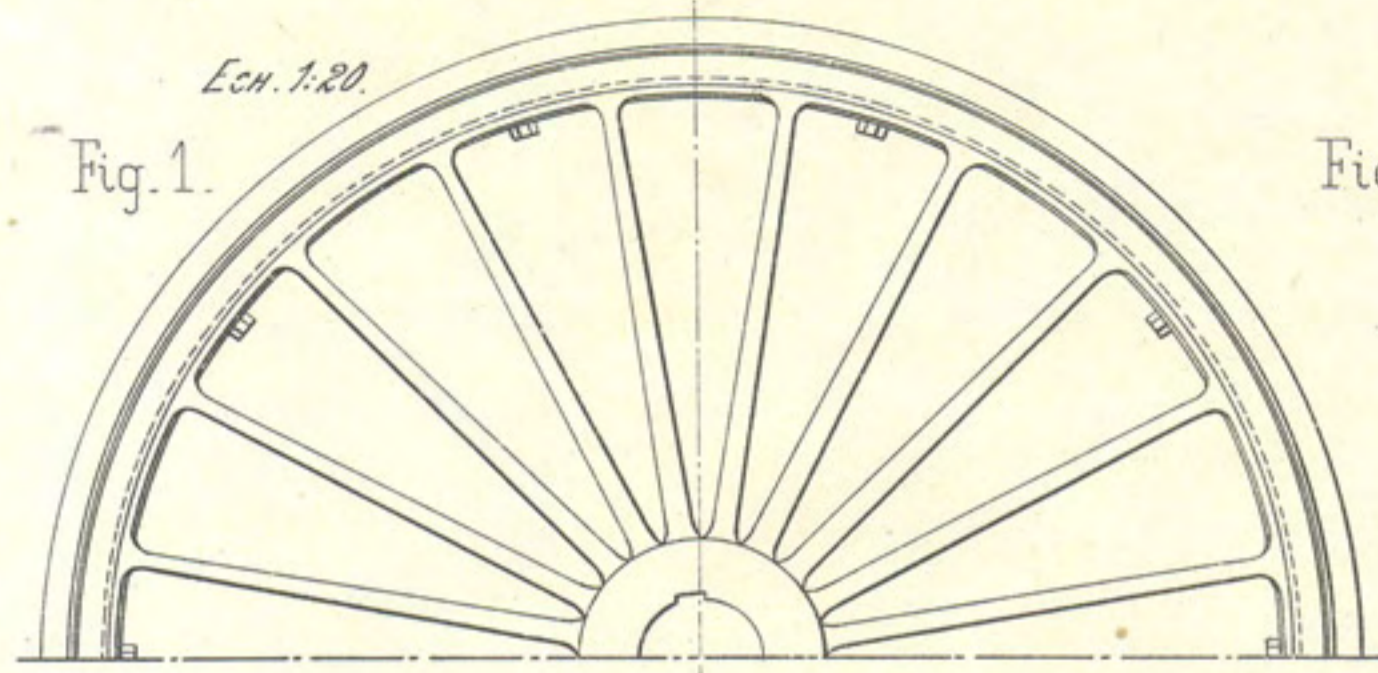


Fig. 3 et 4. Roue manivelle à rayons.

Fig. 7 à 9. Roue motrice américaine en fonte.

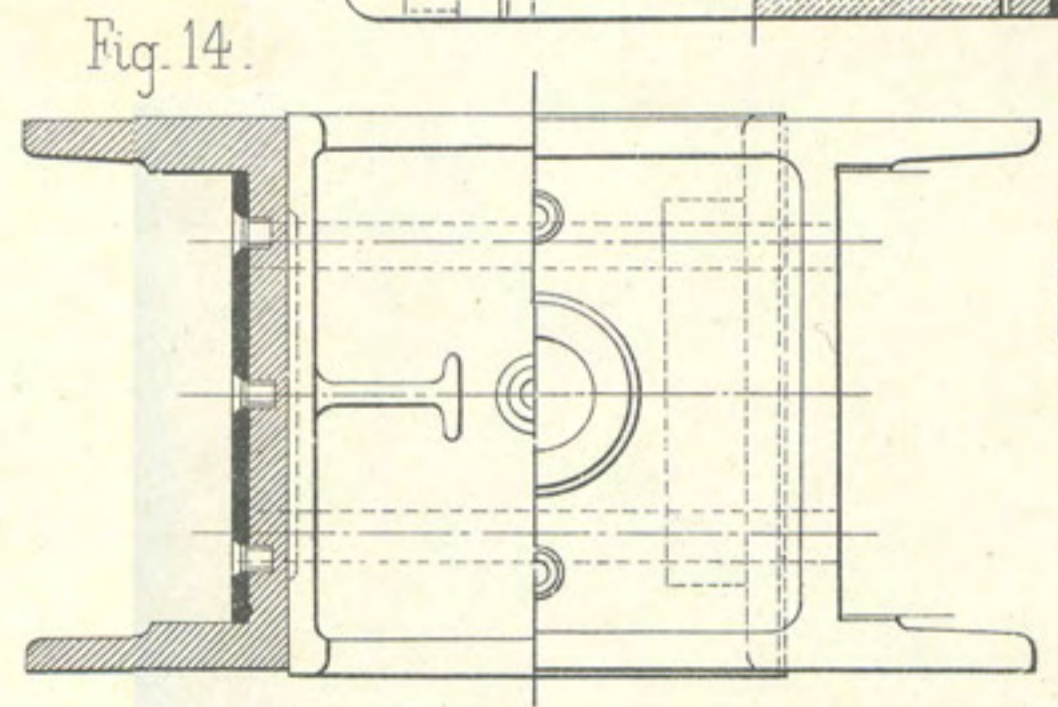
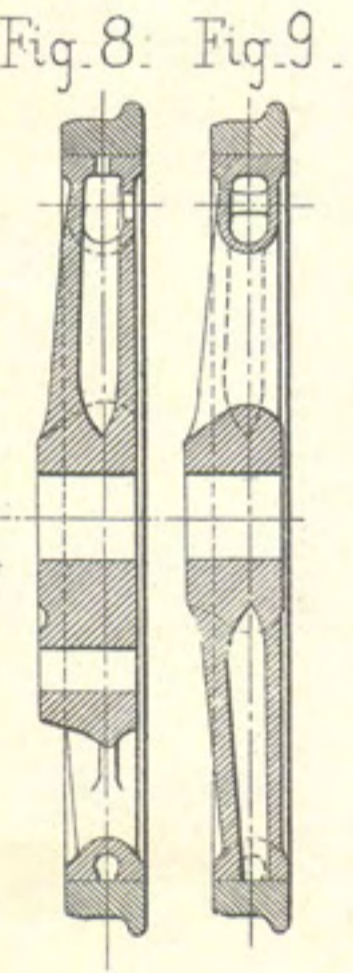
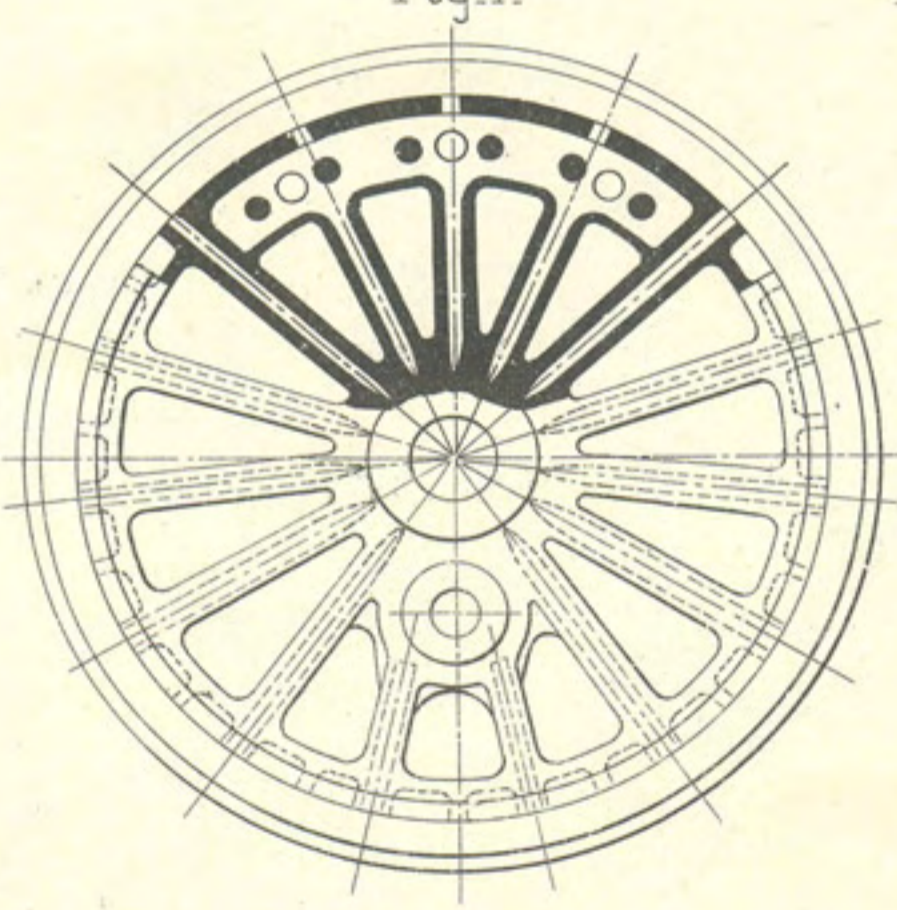
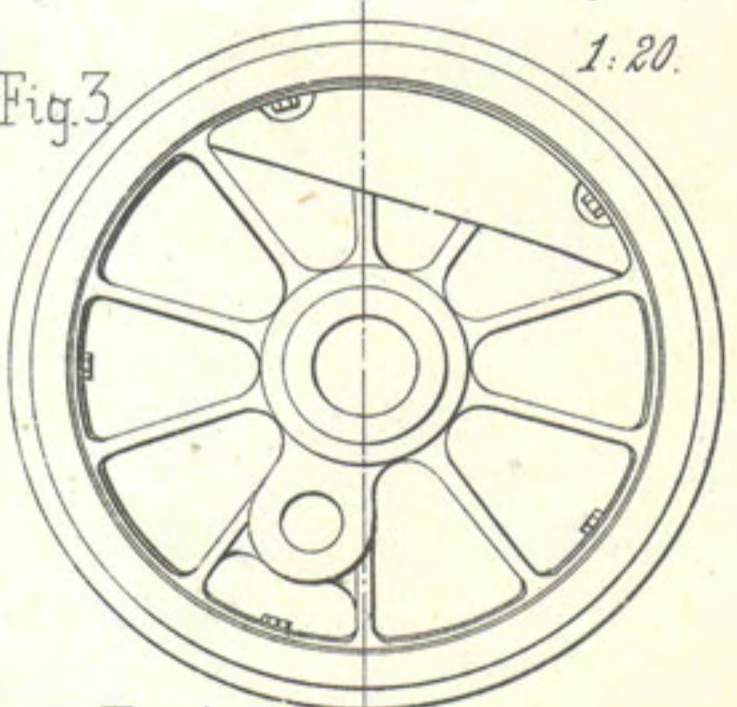


Fig. 21. Longeron à plaques de garde rapportées : M<sup>re</sup> de gare E.B.

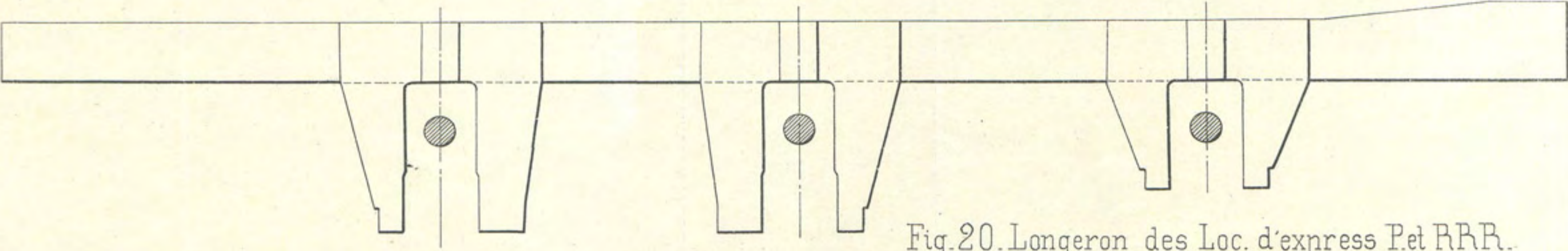


Fig. 20. Longeron des Loc. d'express Pet R.R.R.

Fig. 19. Longeron des Loc. à 10 roues de P.R.R.

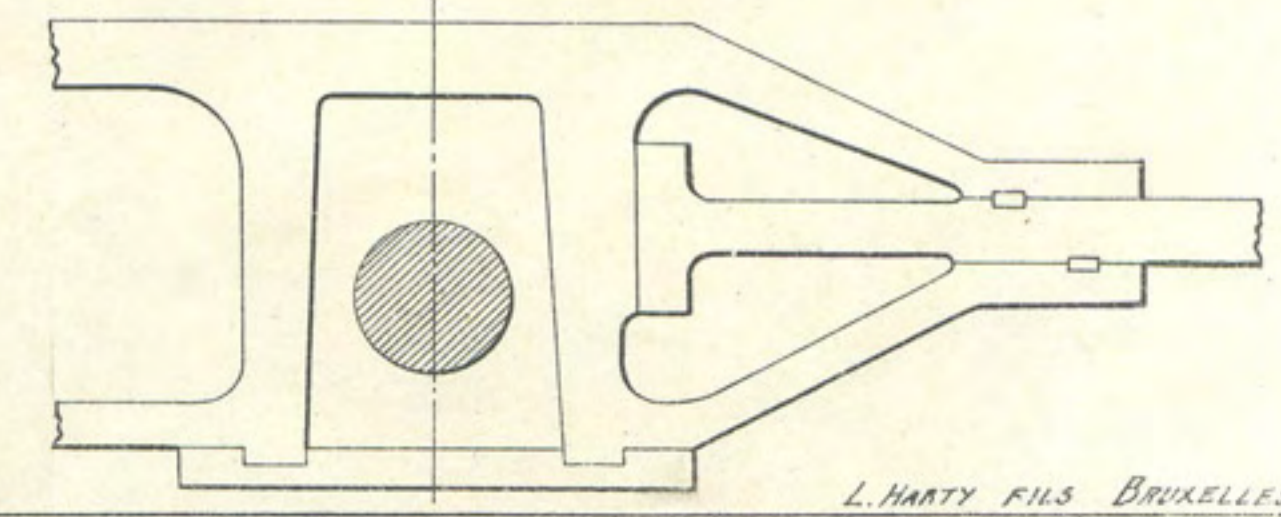
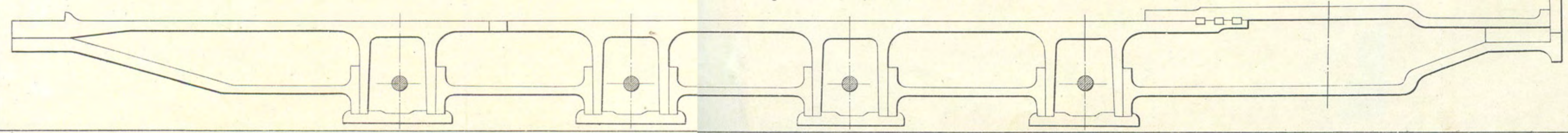


Fig. 1 et 2. Tôle entretoise entre chaudière et longerons.

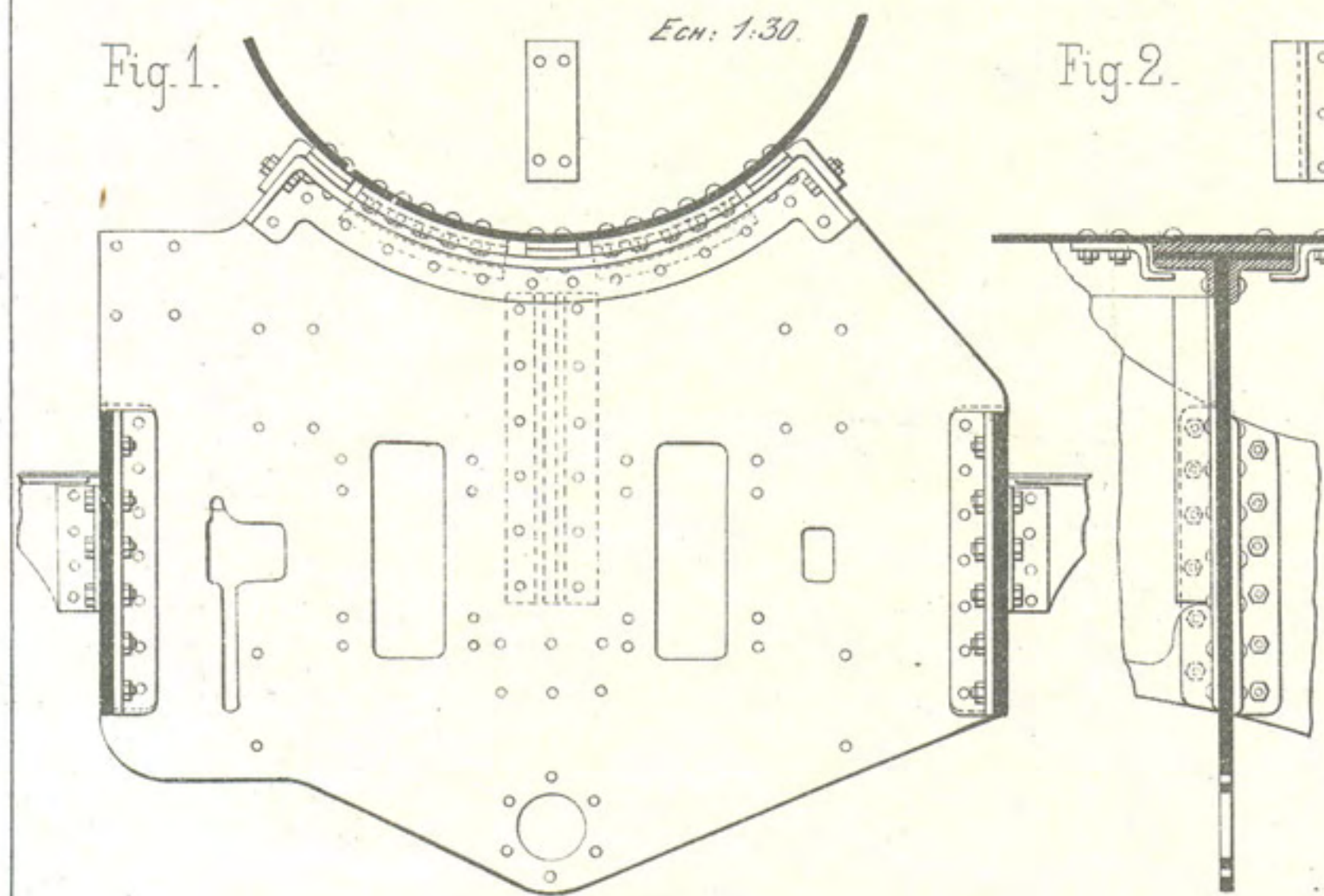
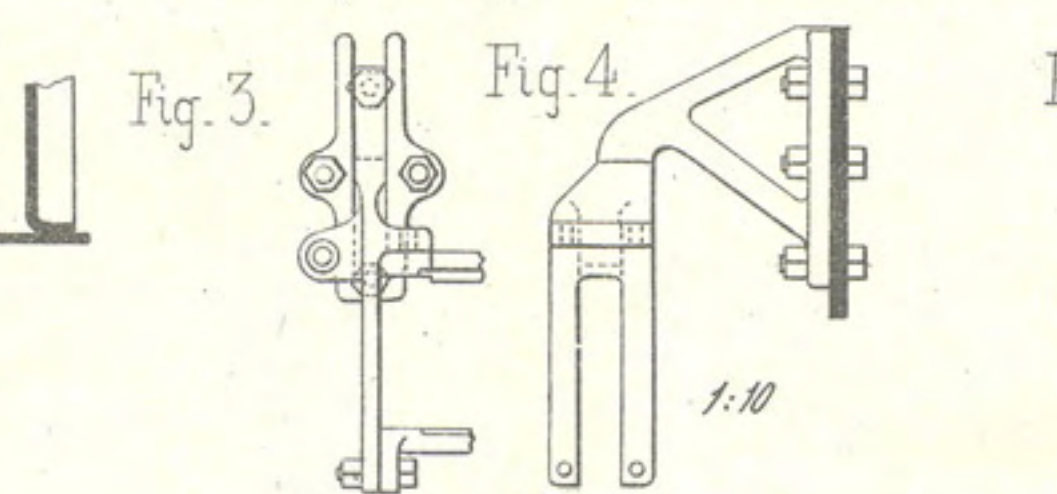
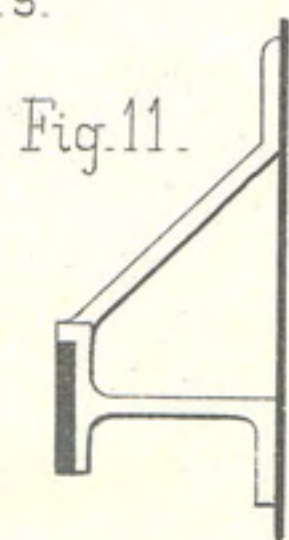


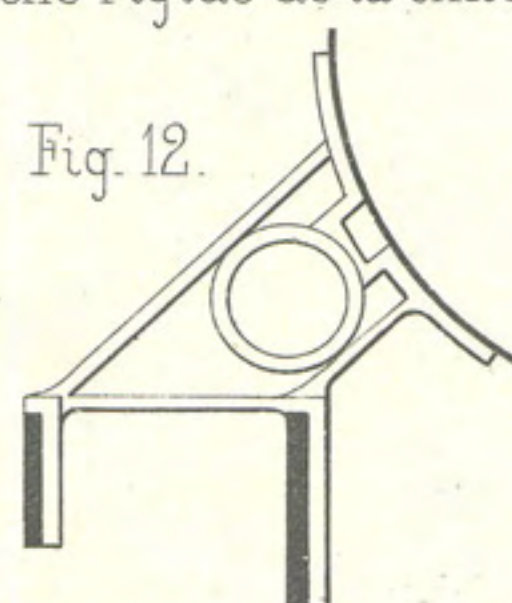
Fig. 3 et 4. Attaches des guides pour cylindres extérieurs.



Attache rigide du foyer.



Attache rigide de la chaudière.



Appui des ressorts sur les boîtes.

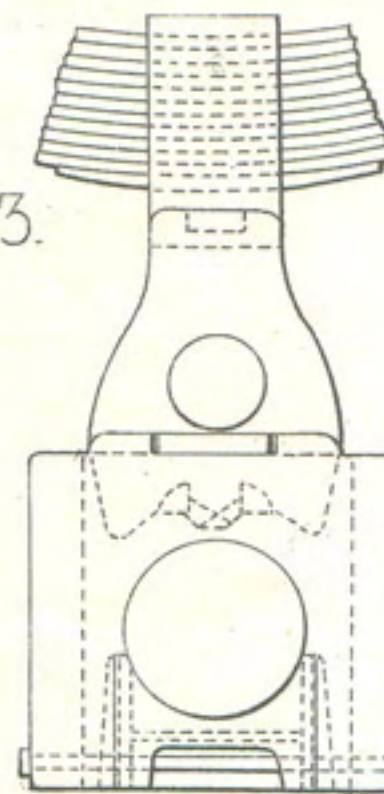


Fig. 14. Colonne de ressorts à écrous supérieurs.

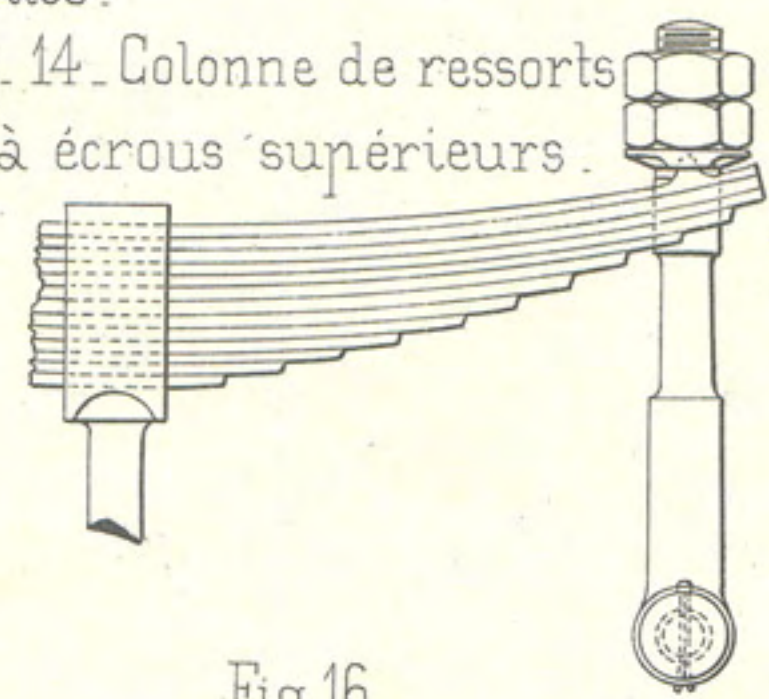


Fig. 15. Colonne de ressorts à écrous inférieurs.

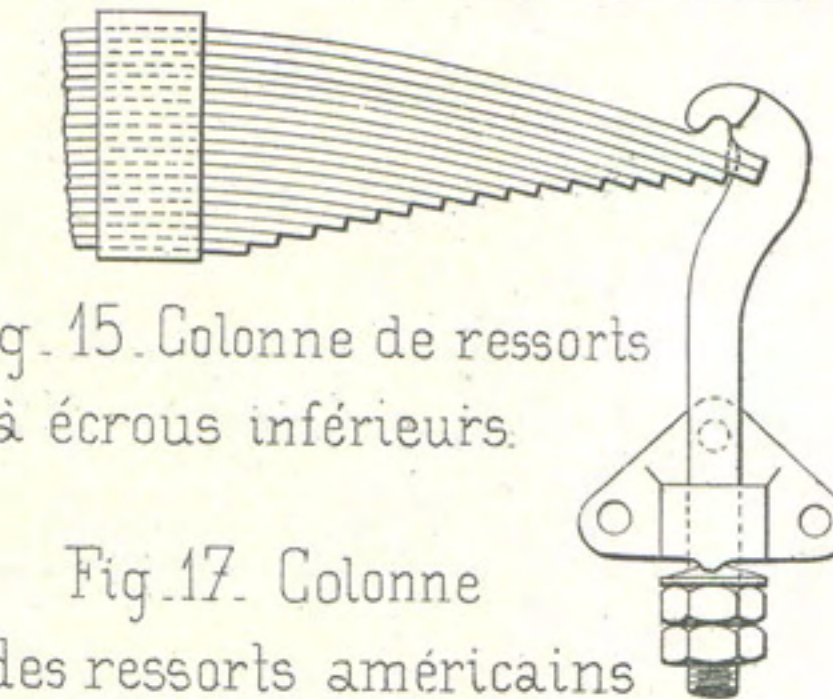


Fig. 17. Colonne des ressorts américains.

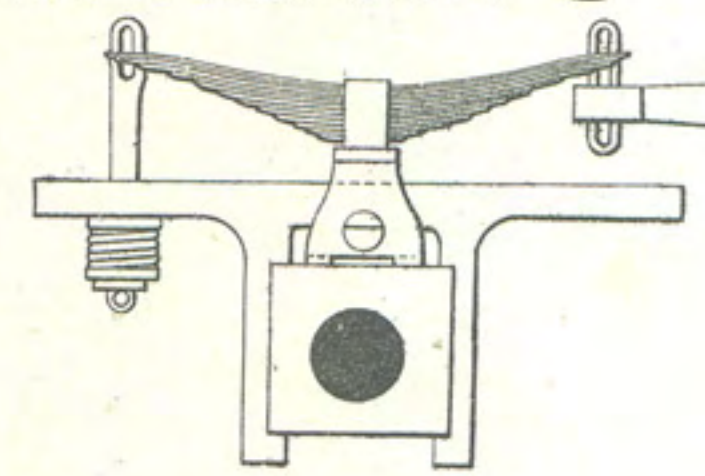
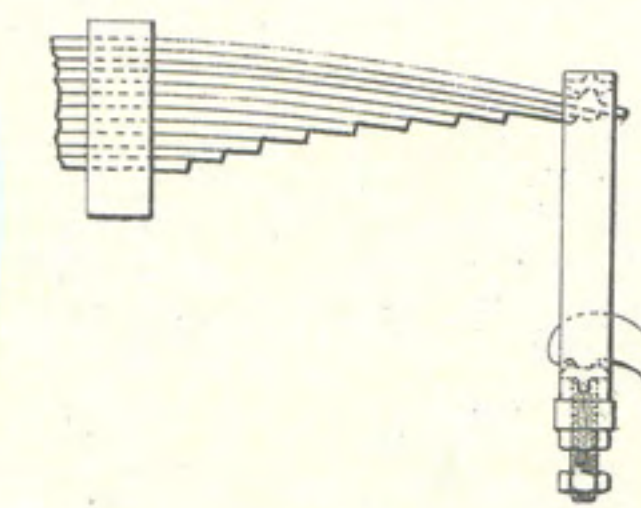


Fig. 16. Suspension des ressorts Belpaire.



Ressort commun à 2 boîtes d'un même essieu.

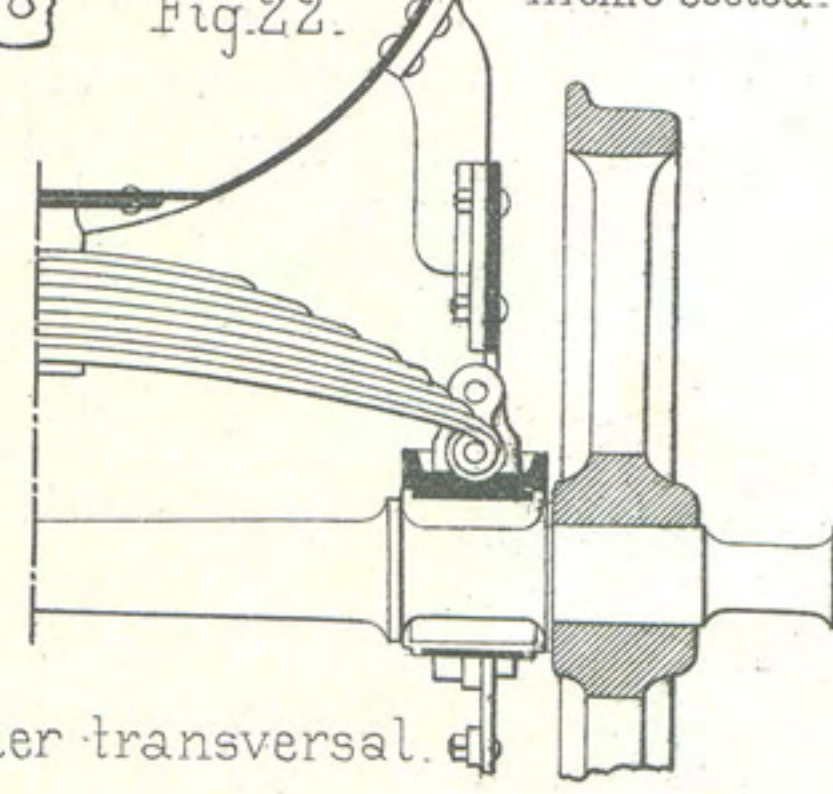


Fig. 6. Boîte de dilatation.

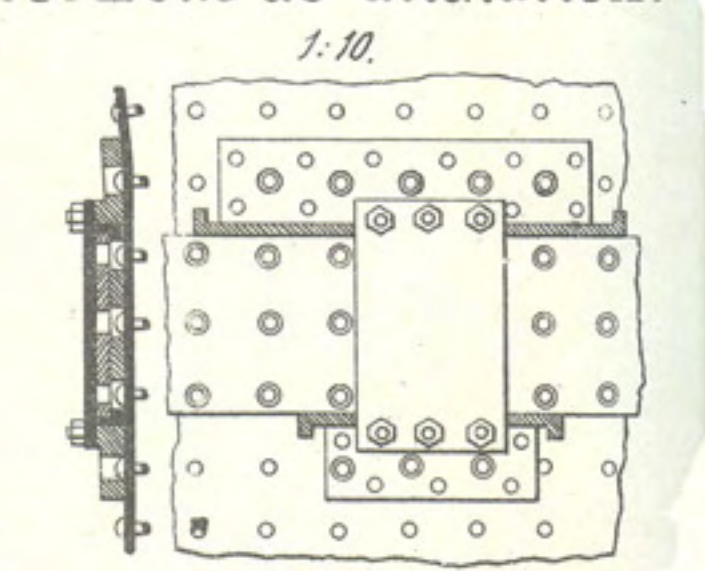


Fig. 7. Selle de glissement.

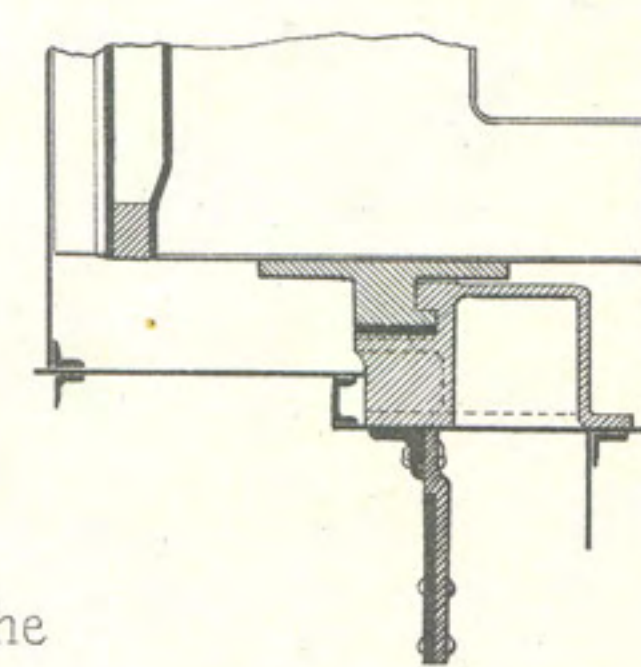


Fig. 20. Emploi de balanciers coudés.

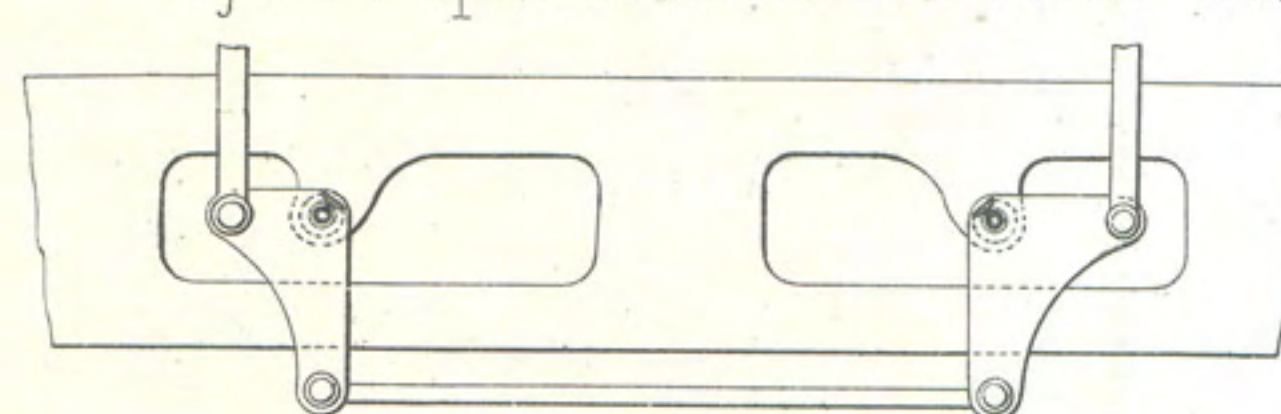


Fig. 5. Longeron intérieur d'essieu coudé.

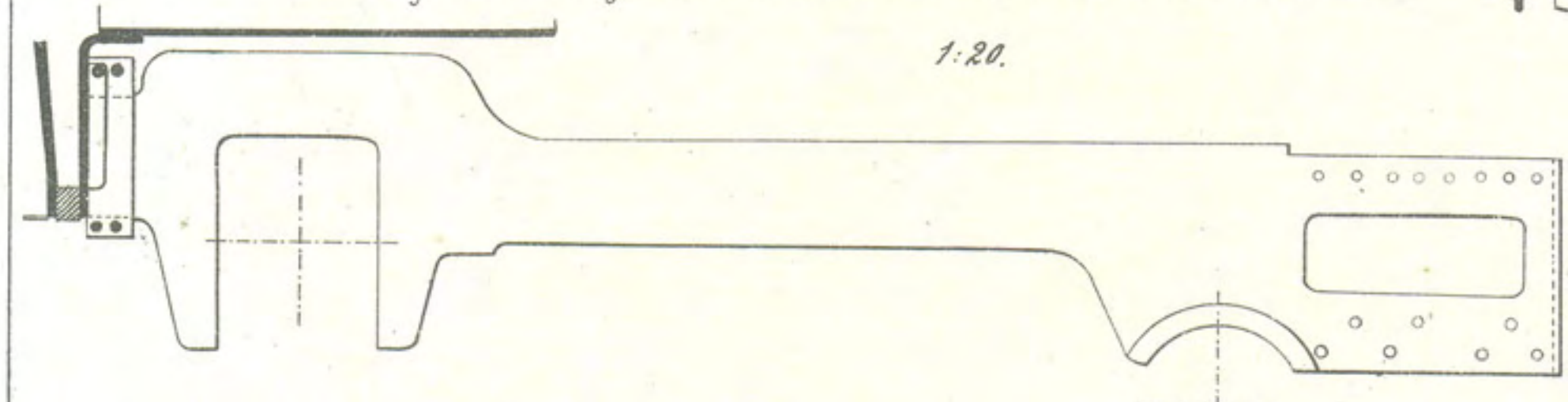


Fig. 9 et 10. Attache flexible du foyer.

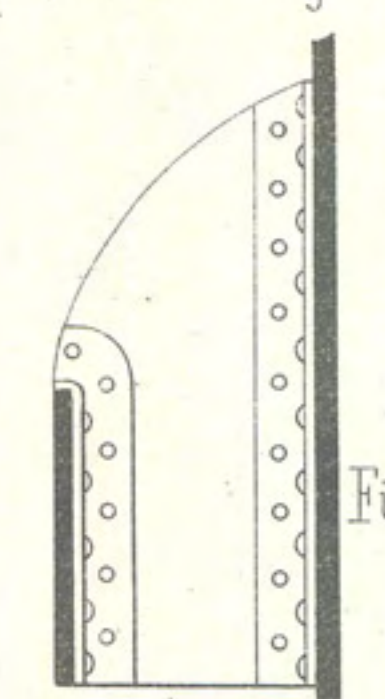


Fig. 18. Fonctionnement des balanciers.

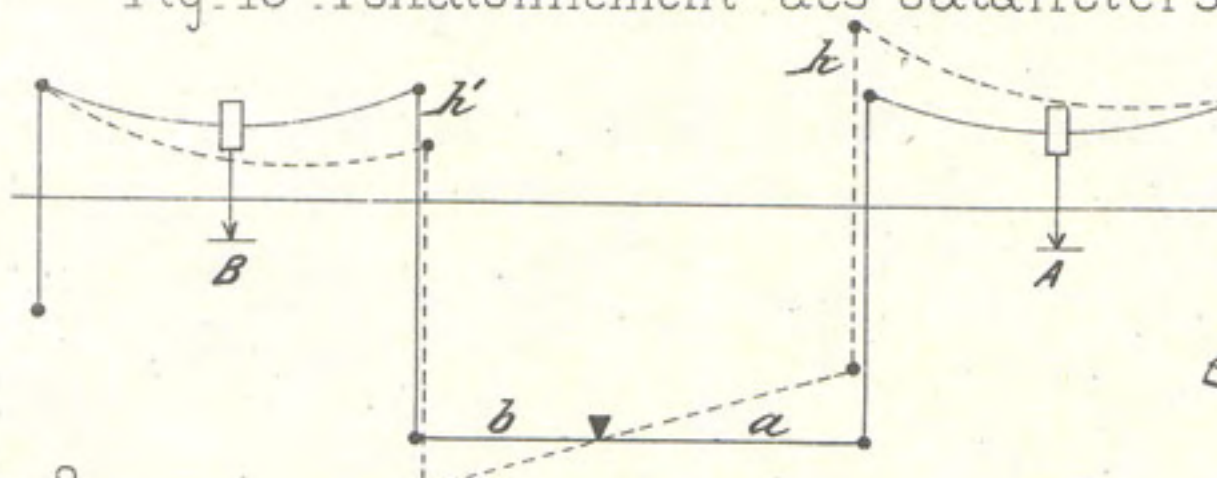


Fig. 21. Combinaison de balanciers et de ressorts.

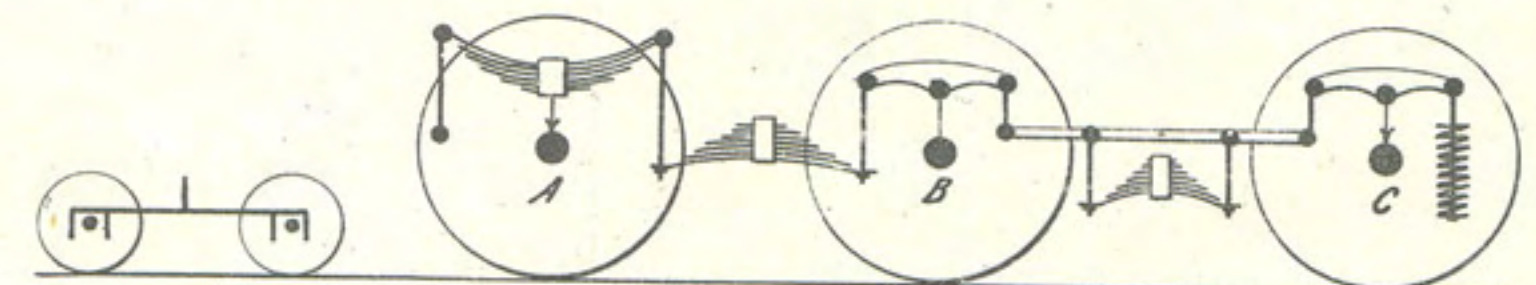


Fig. 8. 8<sup>bis</sup> et 8<sup>ter</sup>. Attache à dilatation libre du foyer Wooten aux longerons.

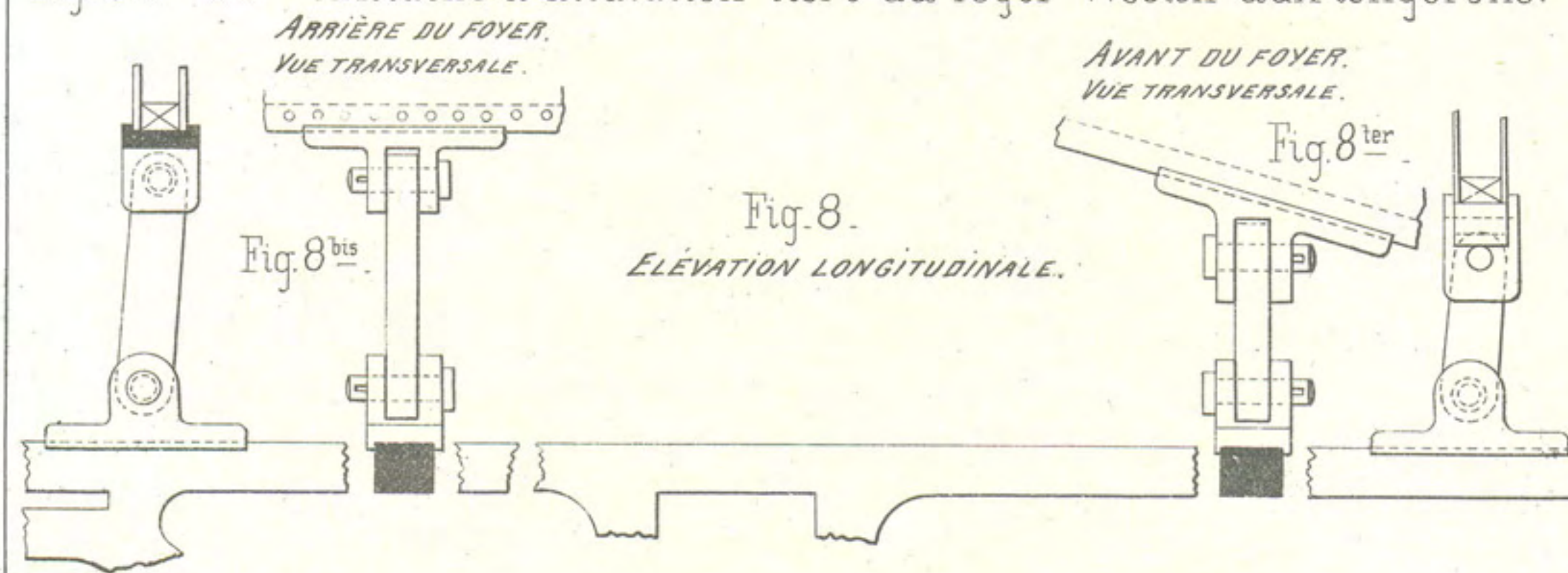


Fig. 19. Balancier des loc. à march. E.B.

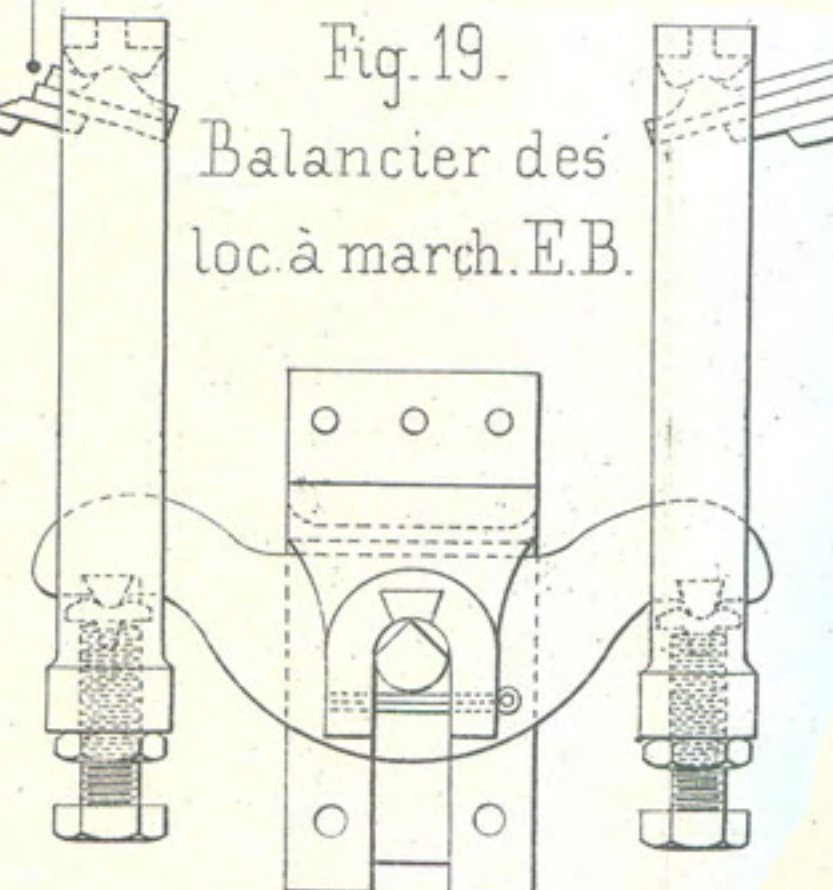


Fig. 24. Balancier transversal.

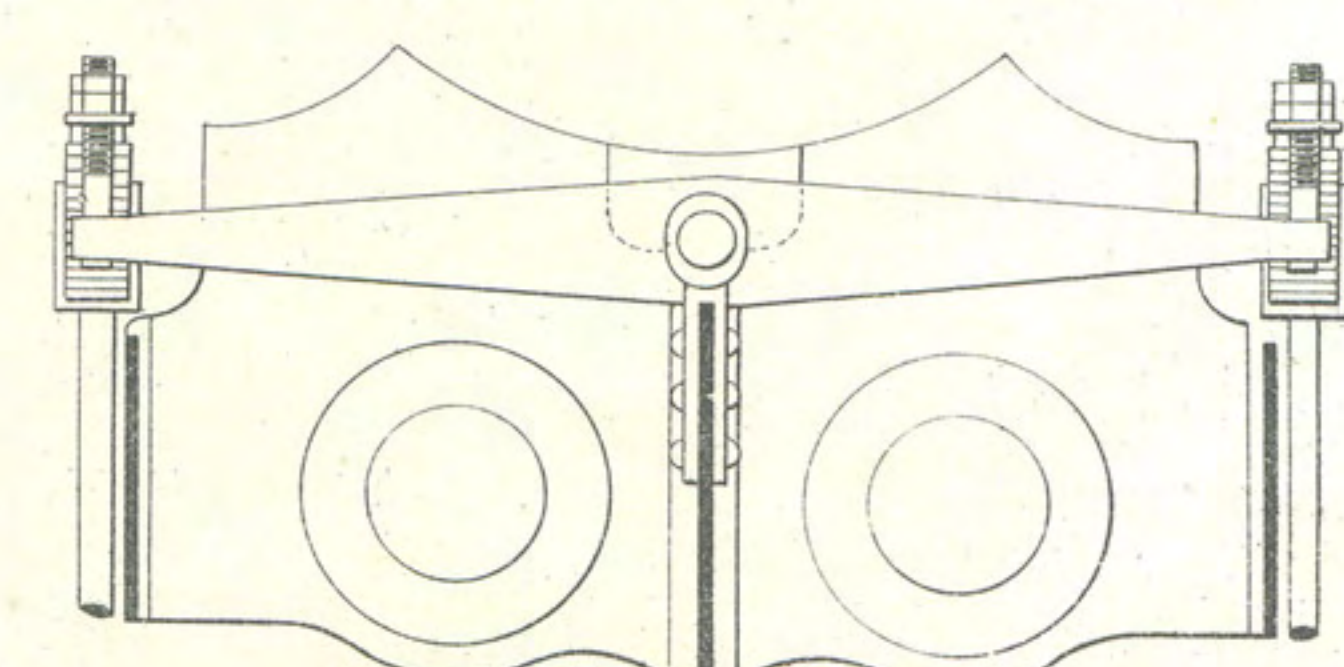


Fig. 23. Ressort transversal.

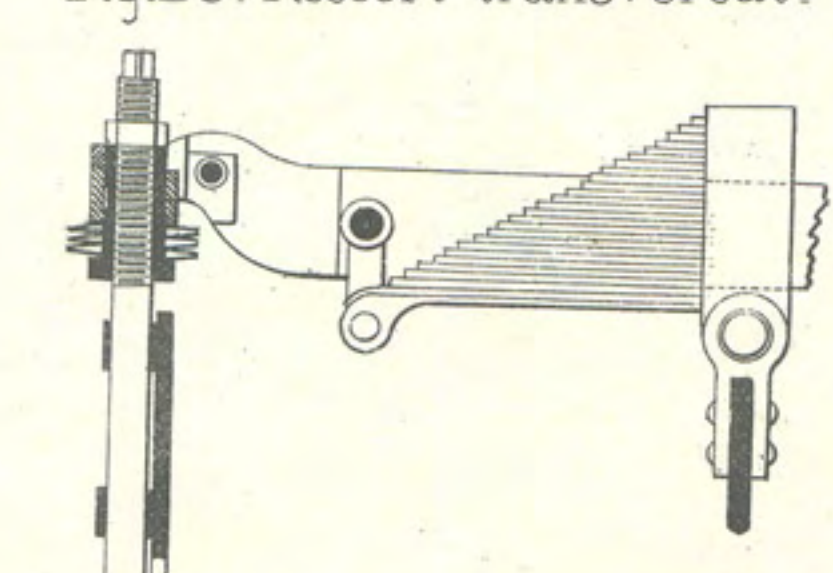


Fig. 1 et 2. Plans inclinés de rappel.  
Boite du Ch. de fer d'Orléans.

Fig. 3 à 5. Bissel ou Bogie à 2 roues PRR. Ech. 1:32.

Fig. 10 à 13. Essieu radial de Webb.

Fig. 18 à 20.  
Bogie des locomotives américaines PRR. Ech. 1:32.

Fig. 1.

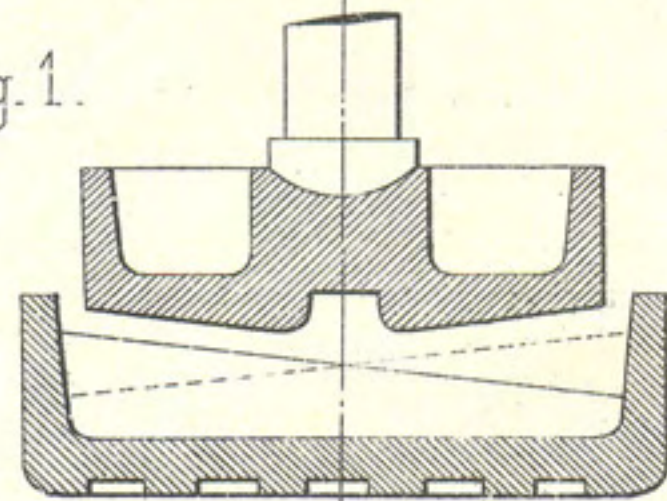


Fig. 2.

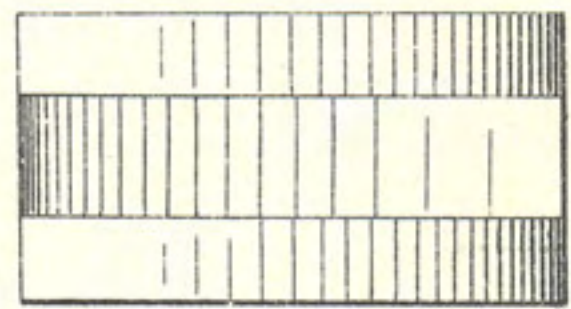


Fig. 6 et 7. Boite radiale d'Adams.

Fig. 6.

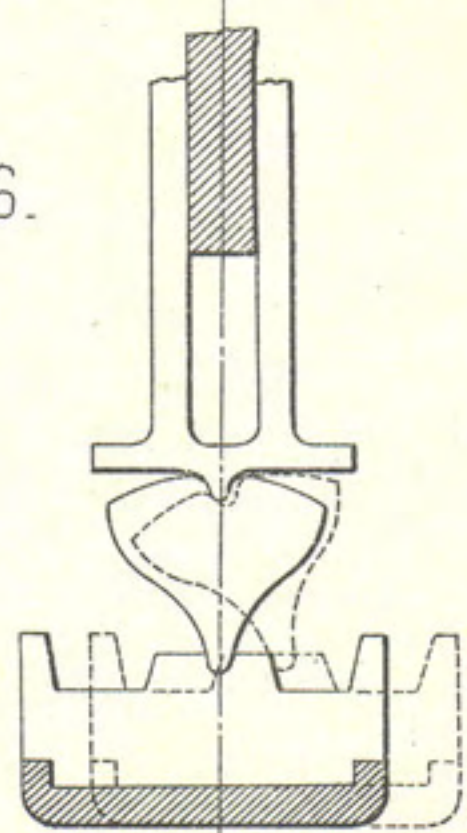


Fig. 7.

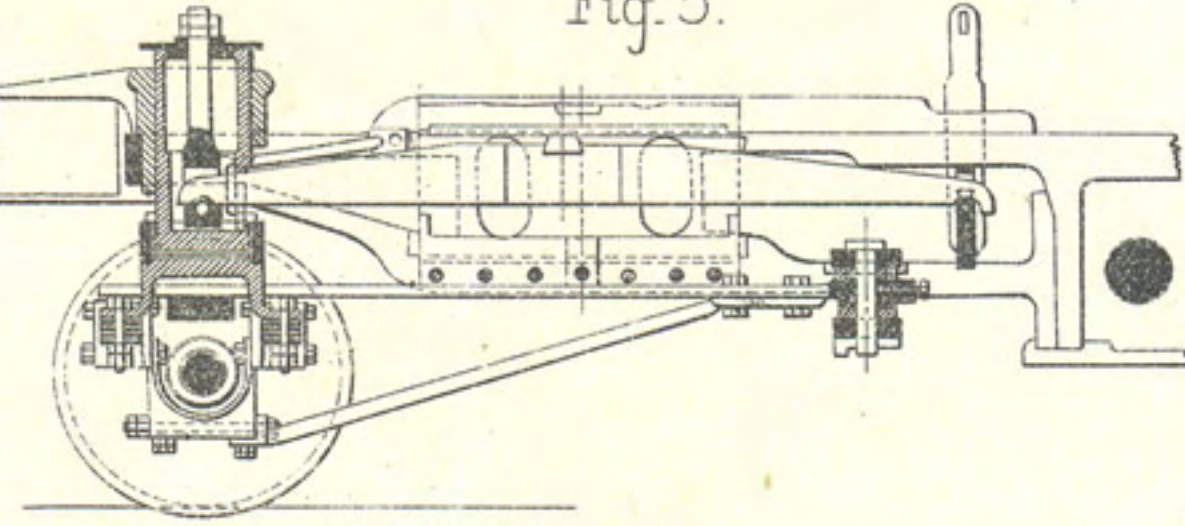
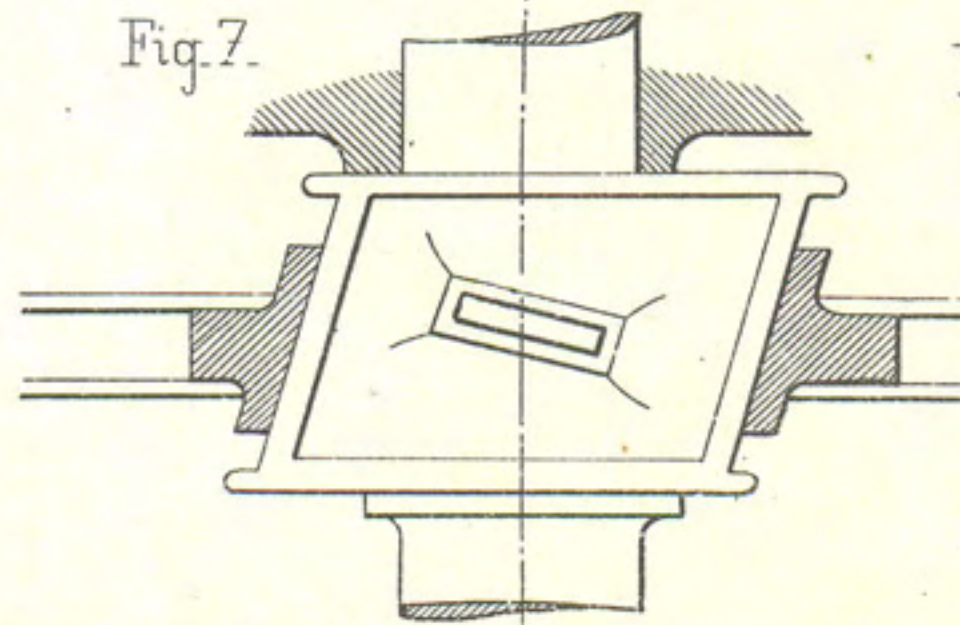


Fig. 3.

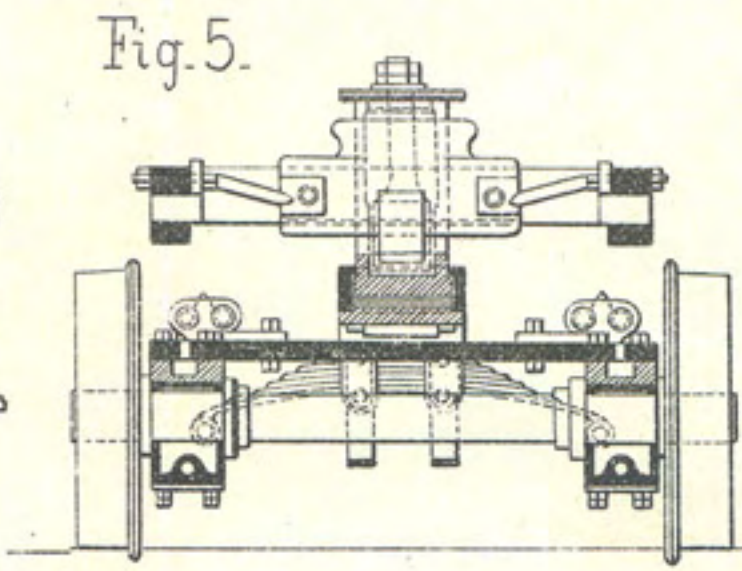


Fig. 5.

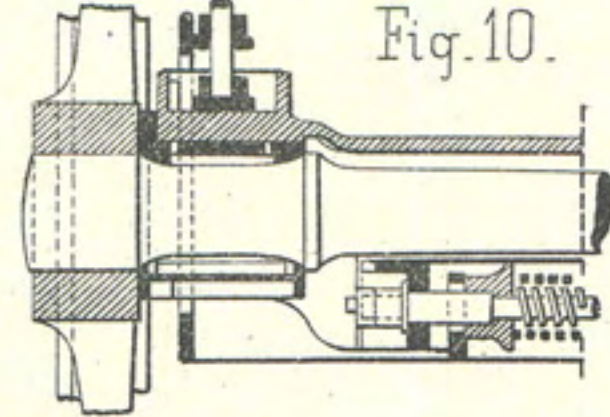


Fig. 10.

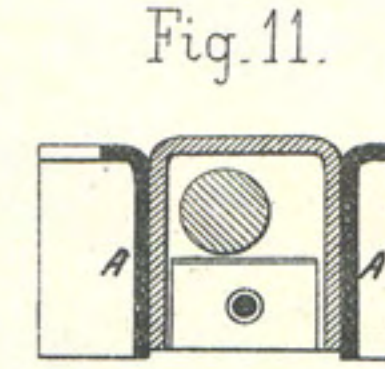


Fig. 11.

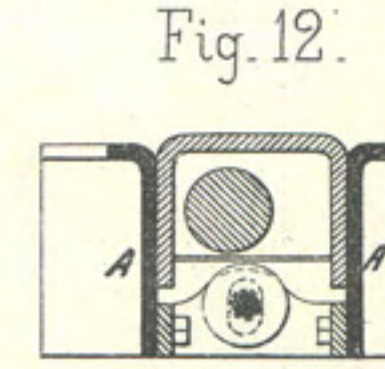


Fig. 12.

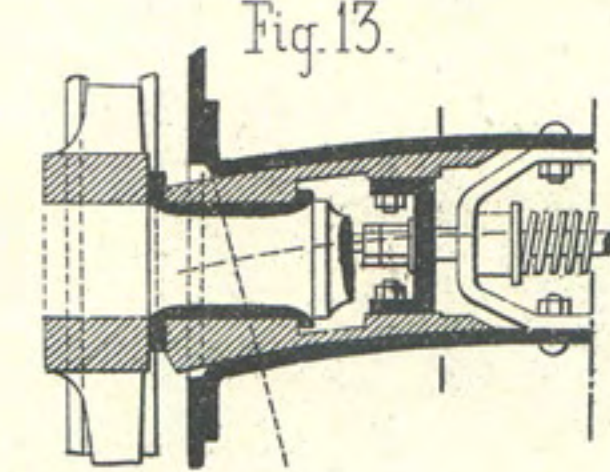


Fig. 13.

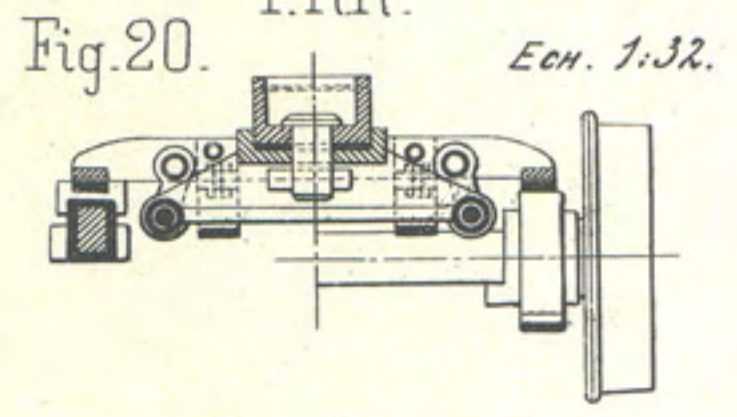


Fig. 20.

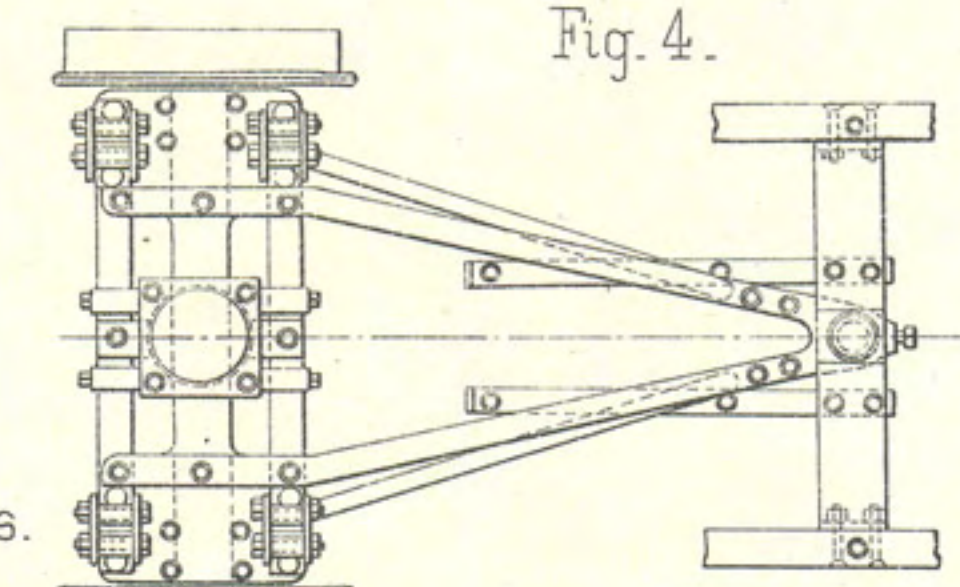
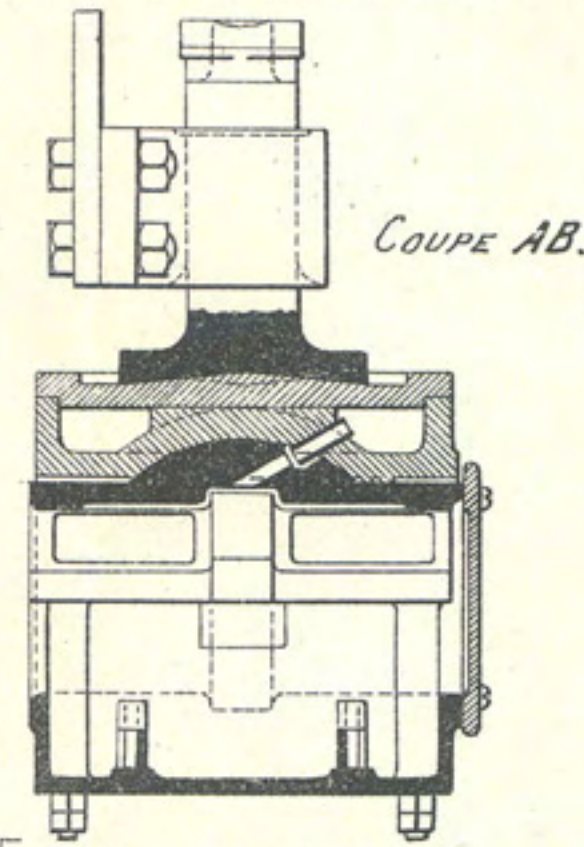


Fig. 4.

Fig. 14 à 16. Boite radiale de l'Etat Belge.

Fig. 14.



COUPE AB.

Fig. 17. Bogie à pivot fixe.

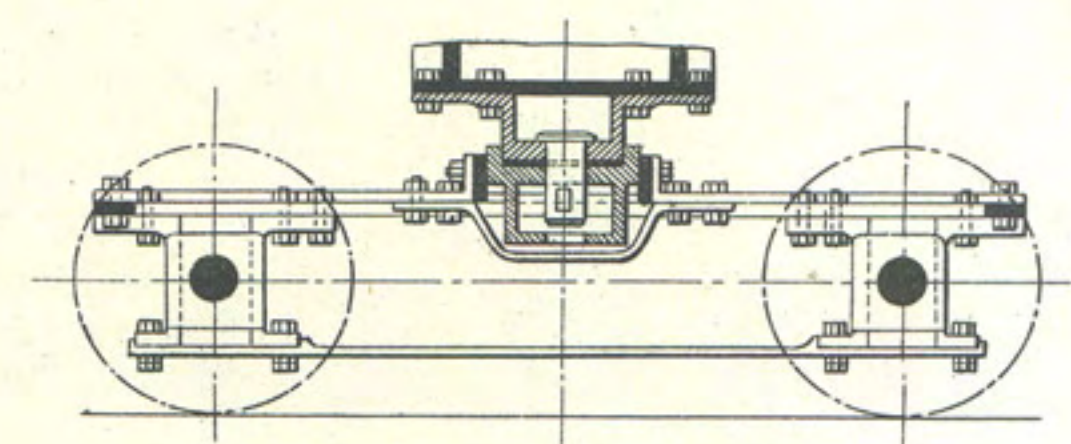
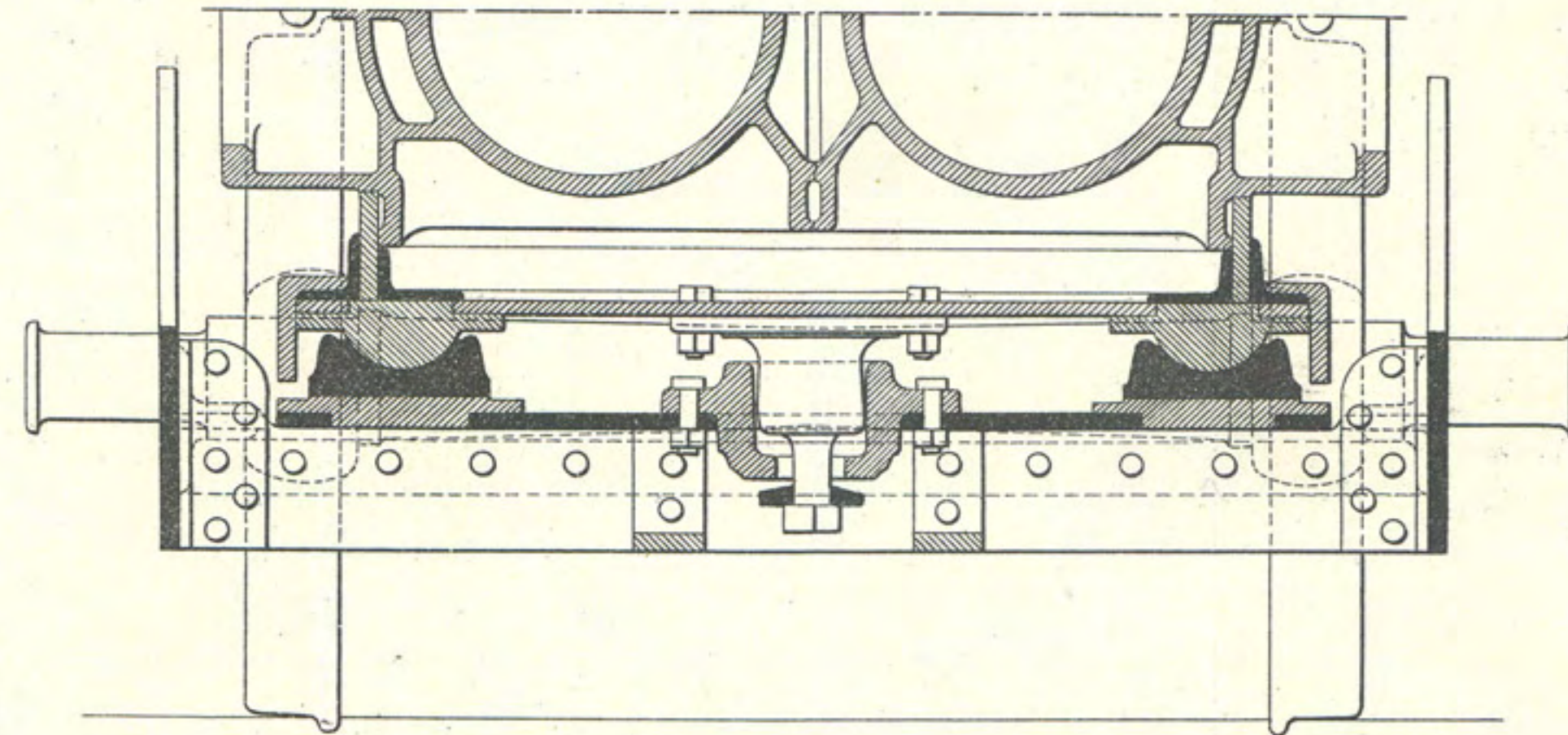


Fig. 18.

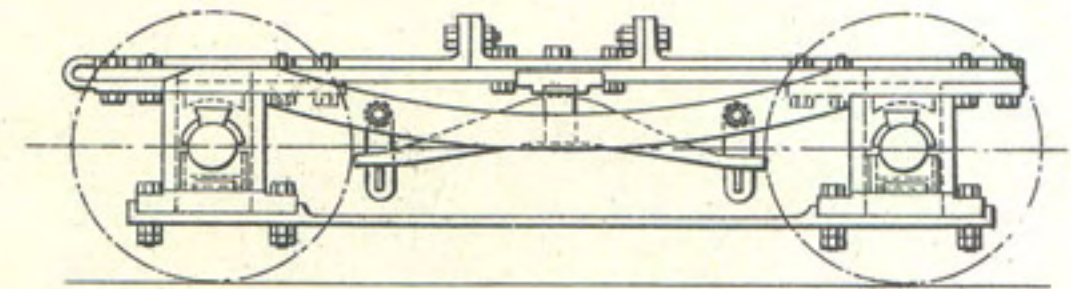


Fig. 19.

Fig. 8 et 9. Boite De Roy.

Fig. 8.

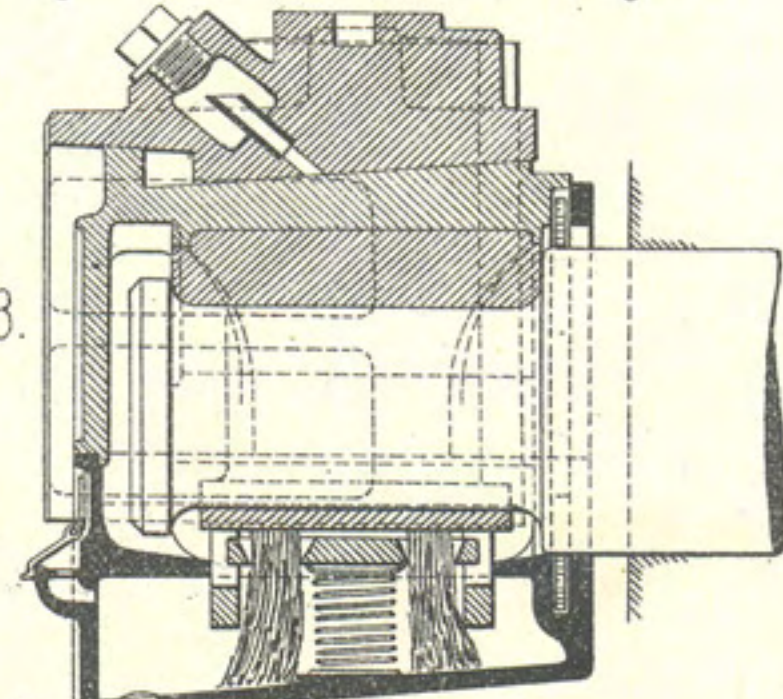


Fig. 9.

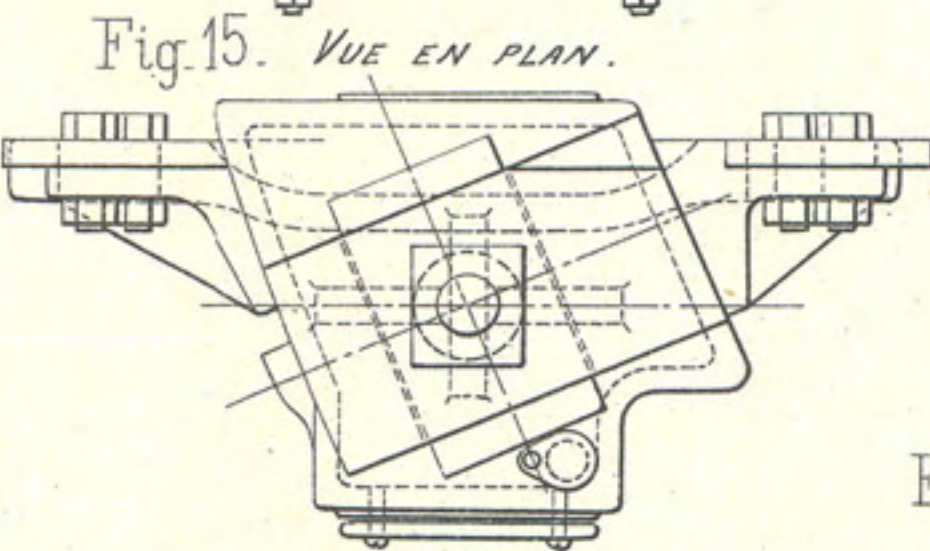
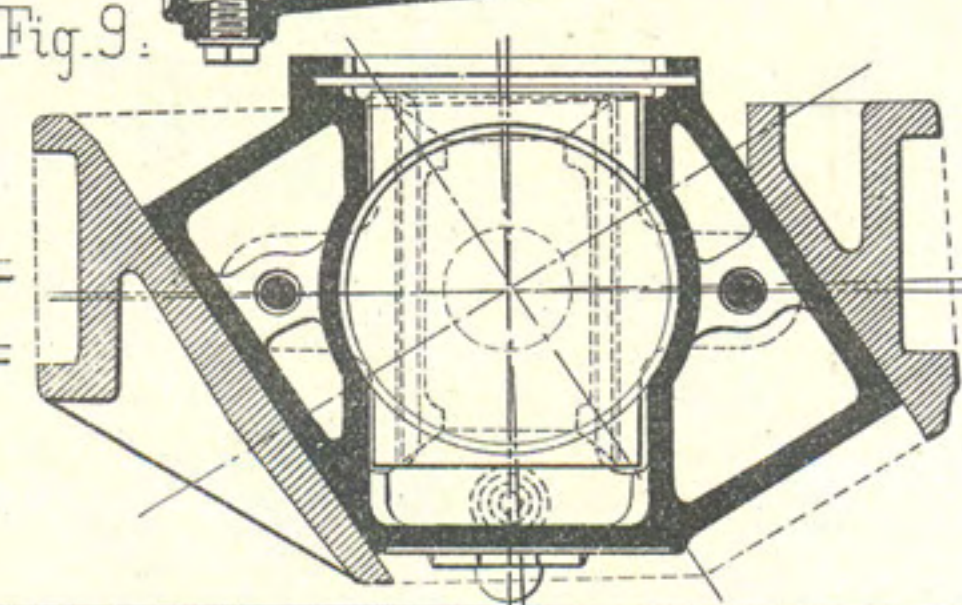


Fig. 15. VUE EN PLAN.

Fig. 16.

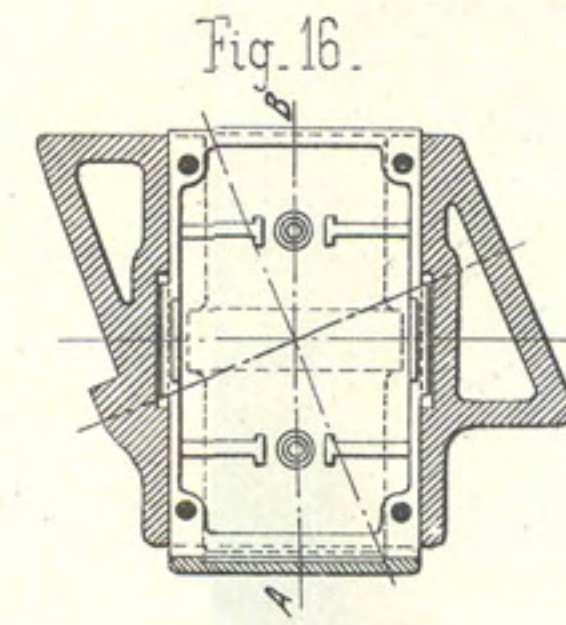


Fig. 21 et 22. Bogie du Midland-Ry.

Fig. 21.

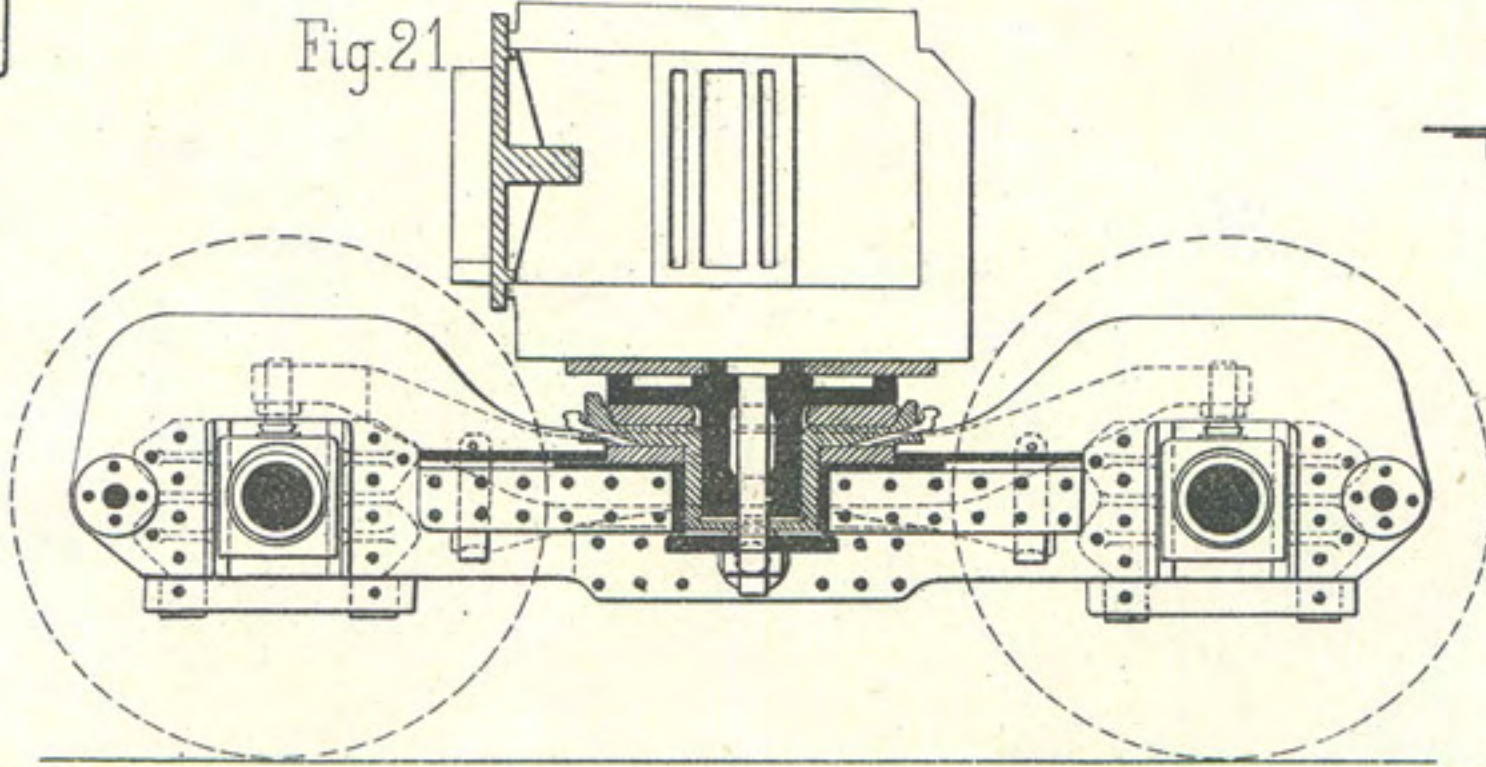


Fig. 22.

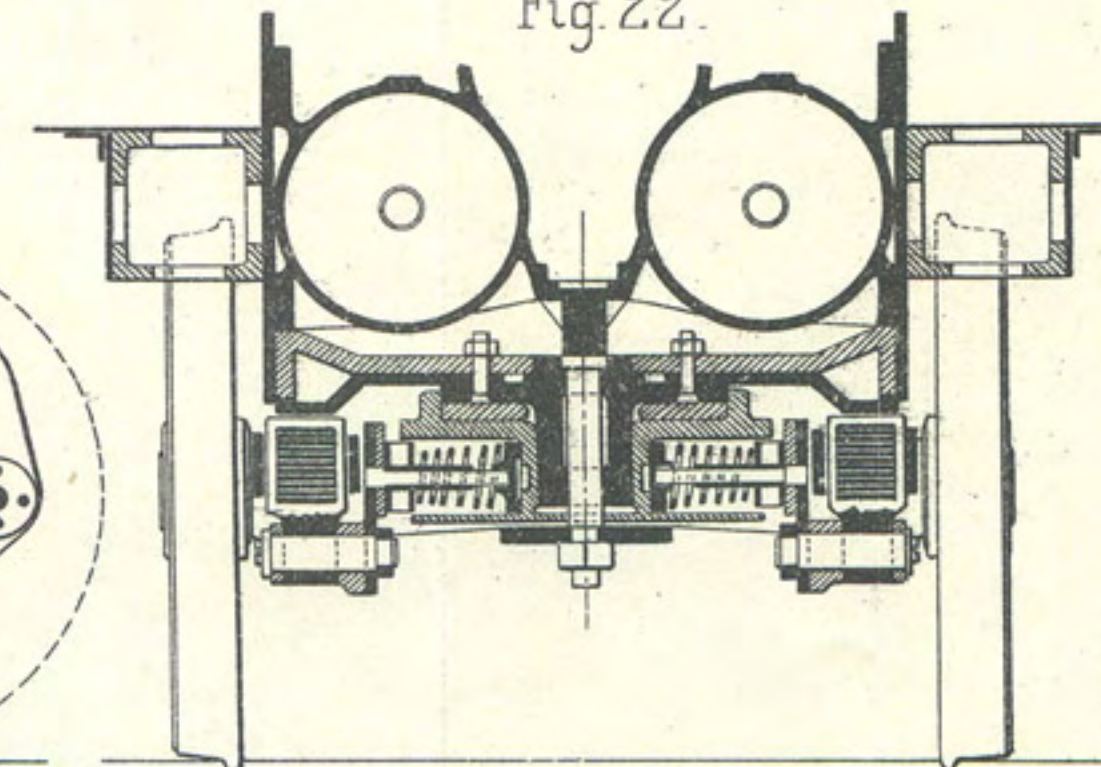


Fig. 23. Bogie de l'Ouest français.

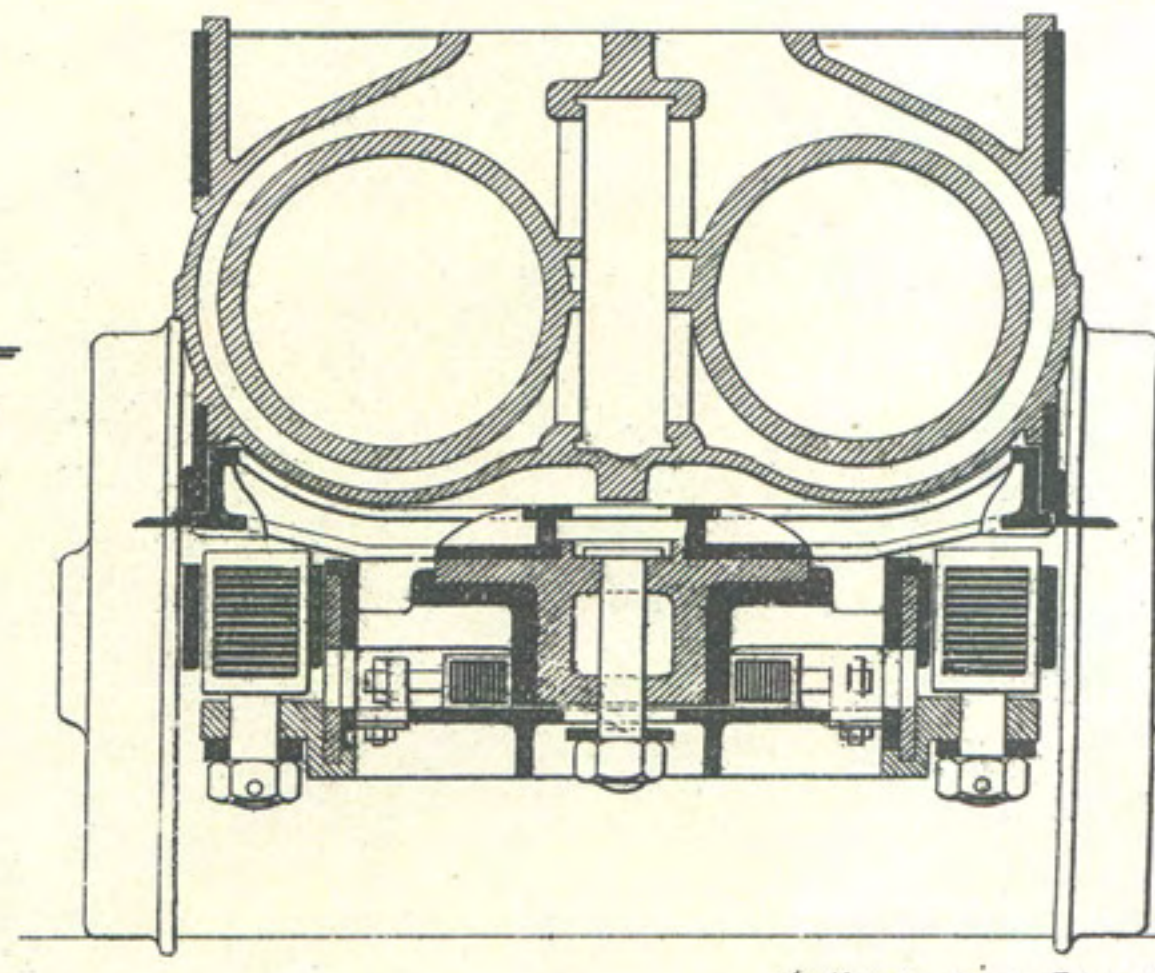


Fig. 1, 2 et 3. Bogie du South Eastern. 1:30.

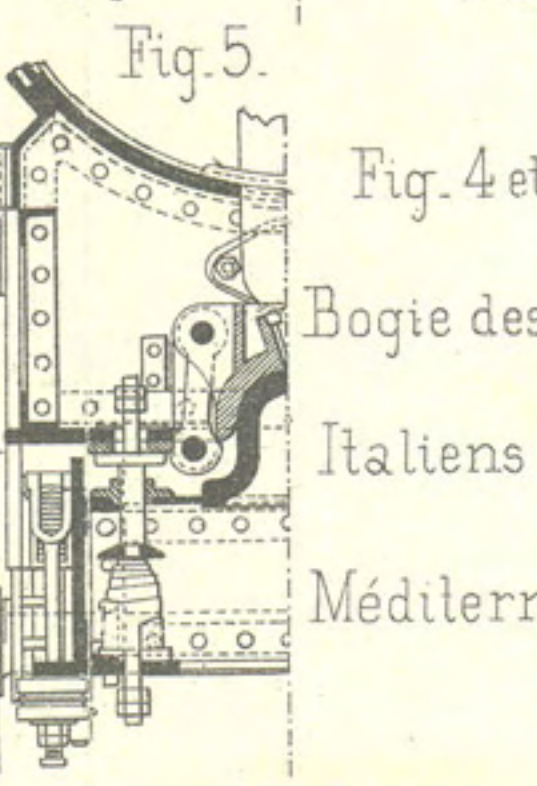
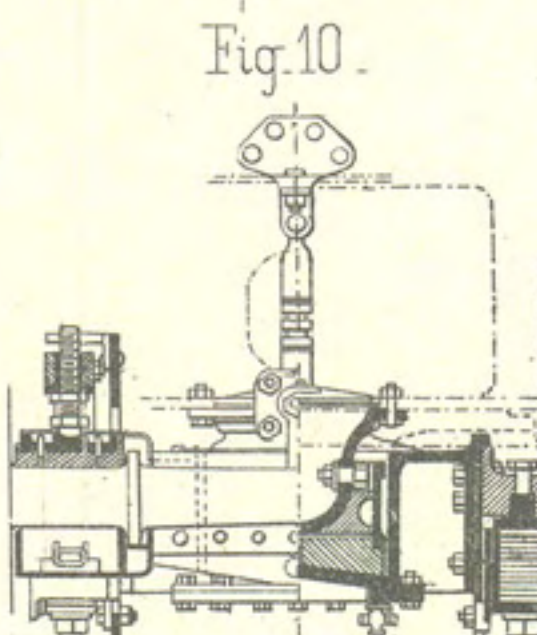
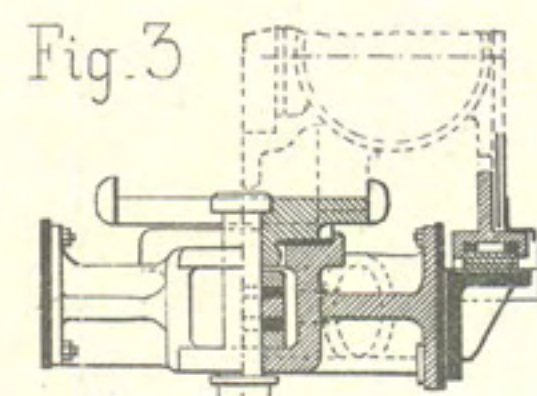
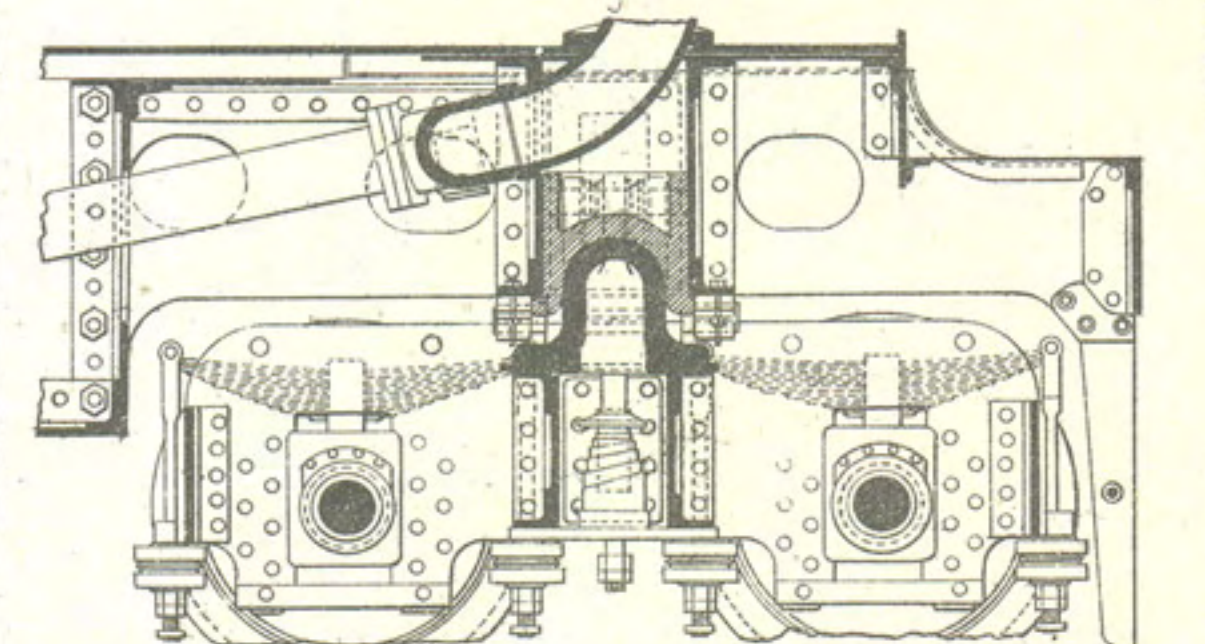
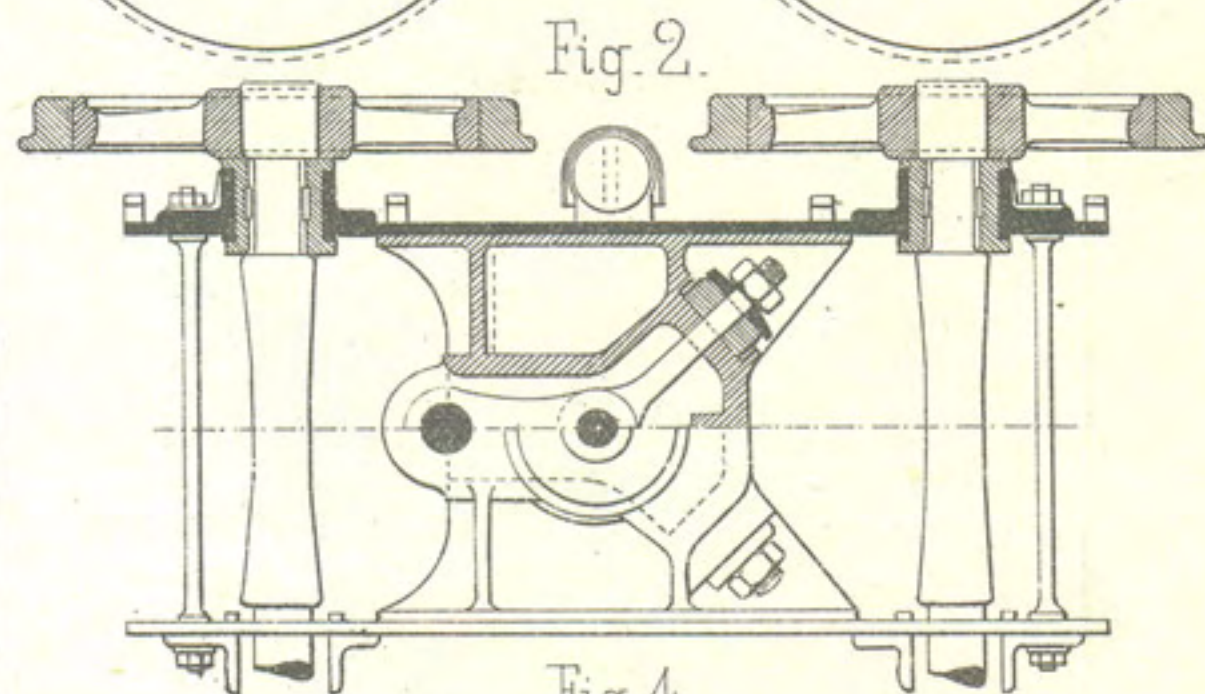
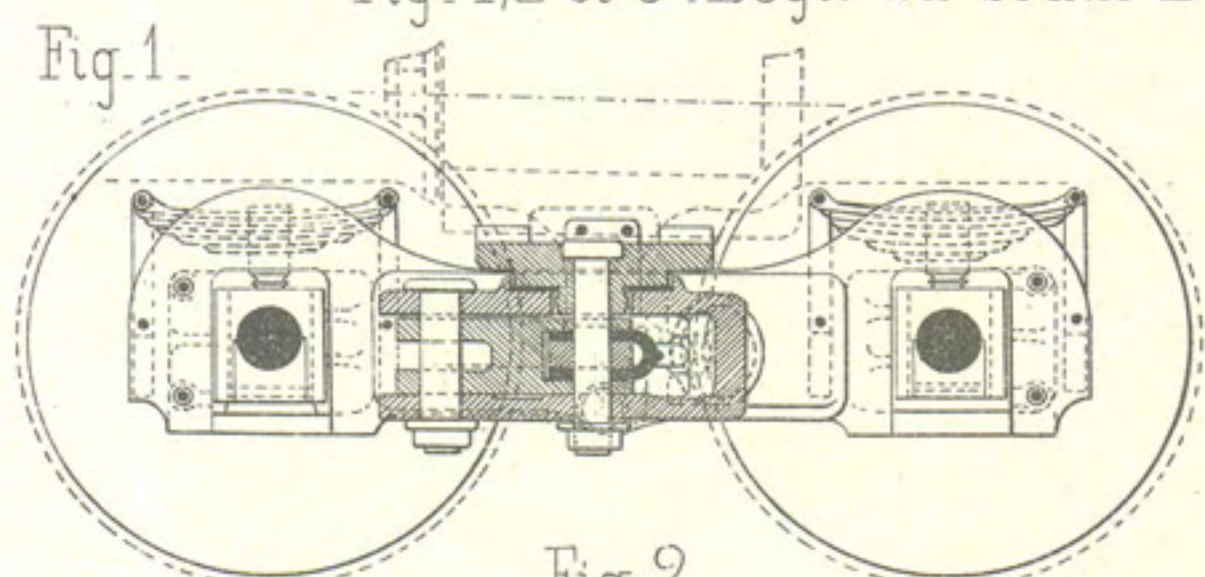


Fig. 8, 9, 10, 11 et 12. Bogie du P.L.M. 1:30.

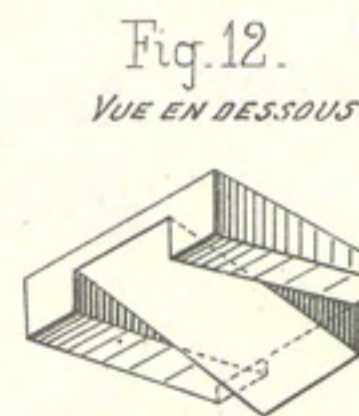
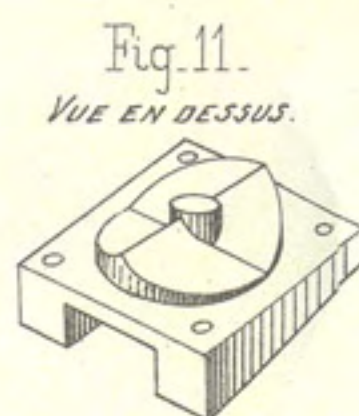
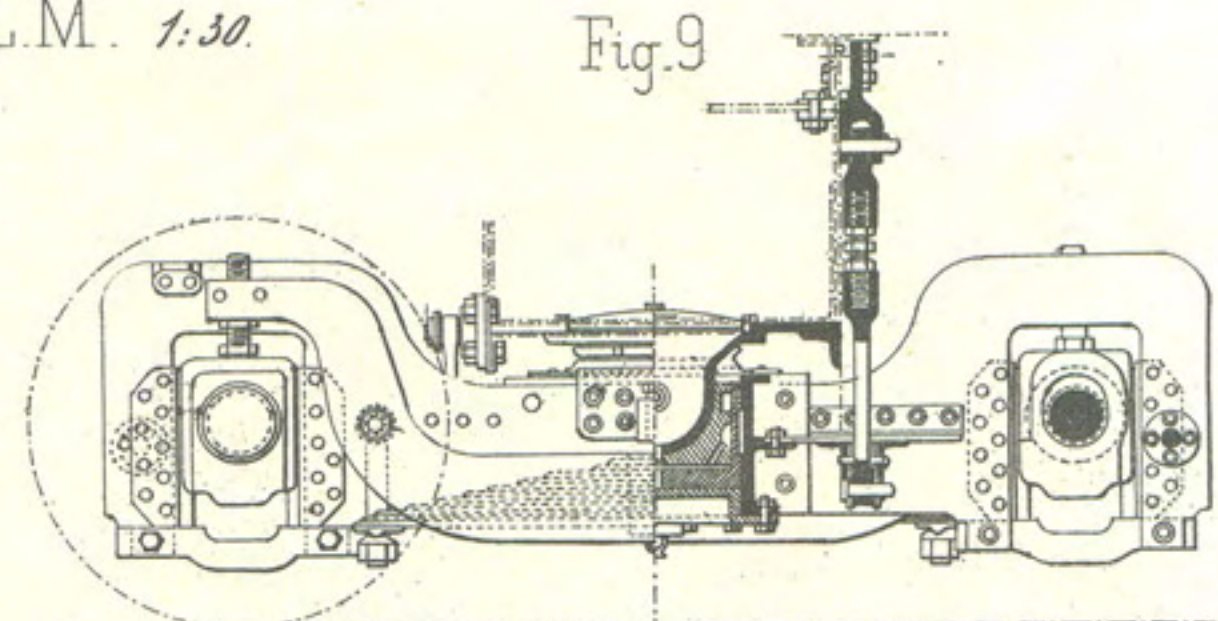
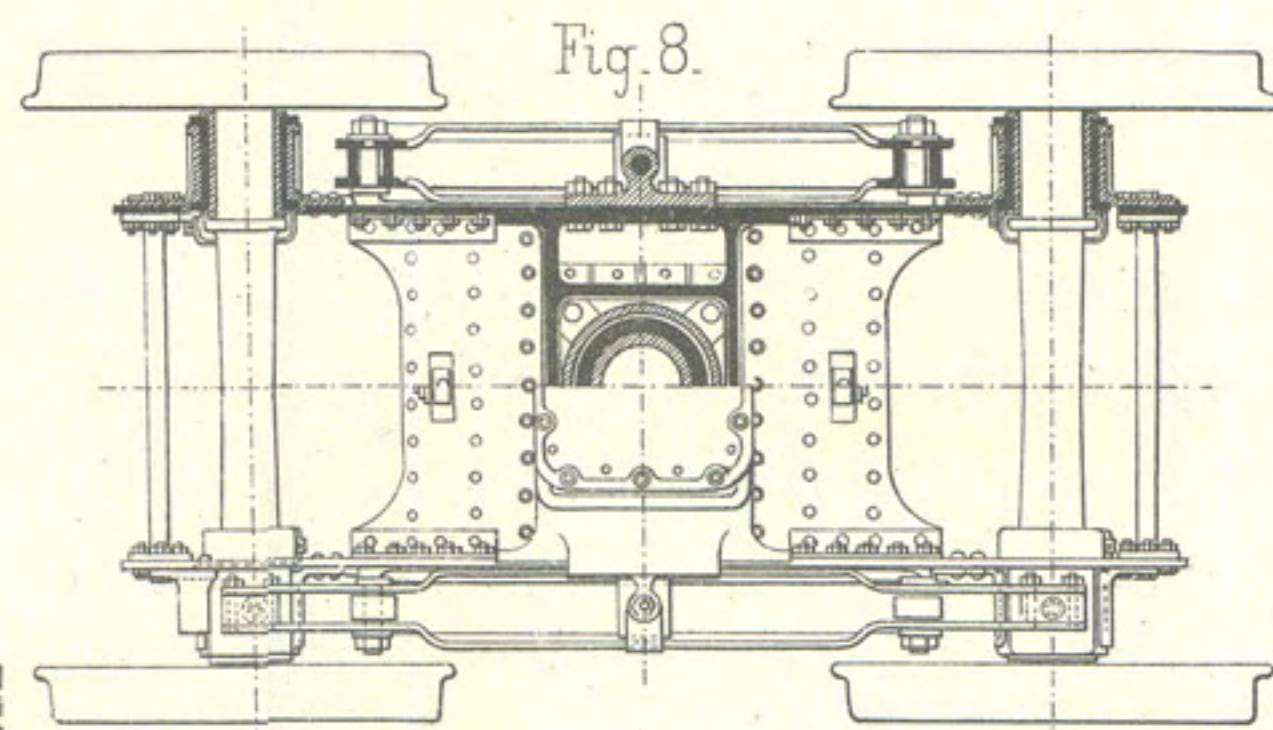


Fig. 15. Attelage du tender de l'Ouest. 1:20.

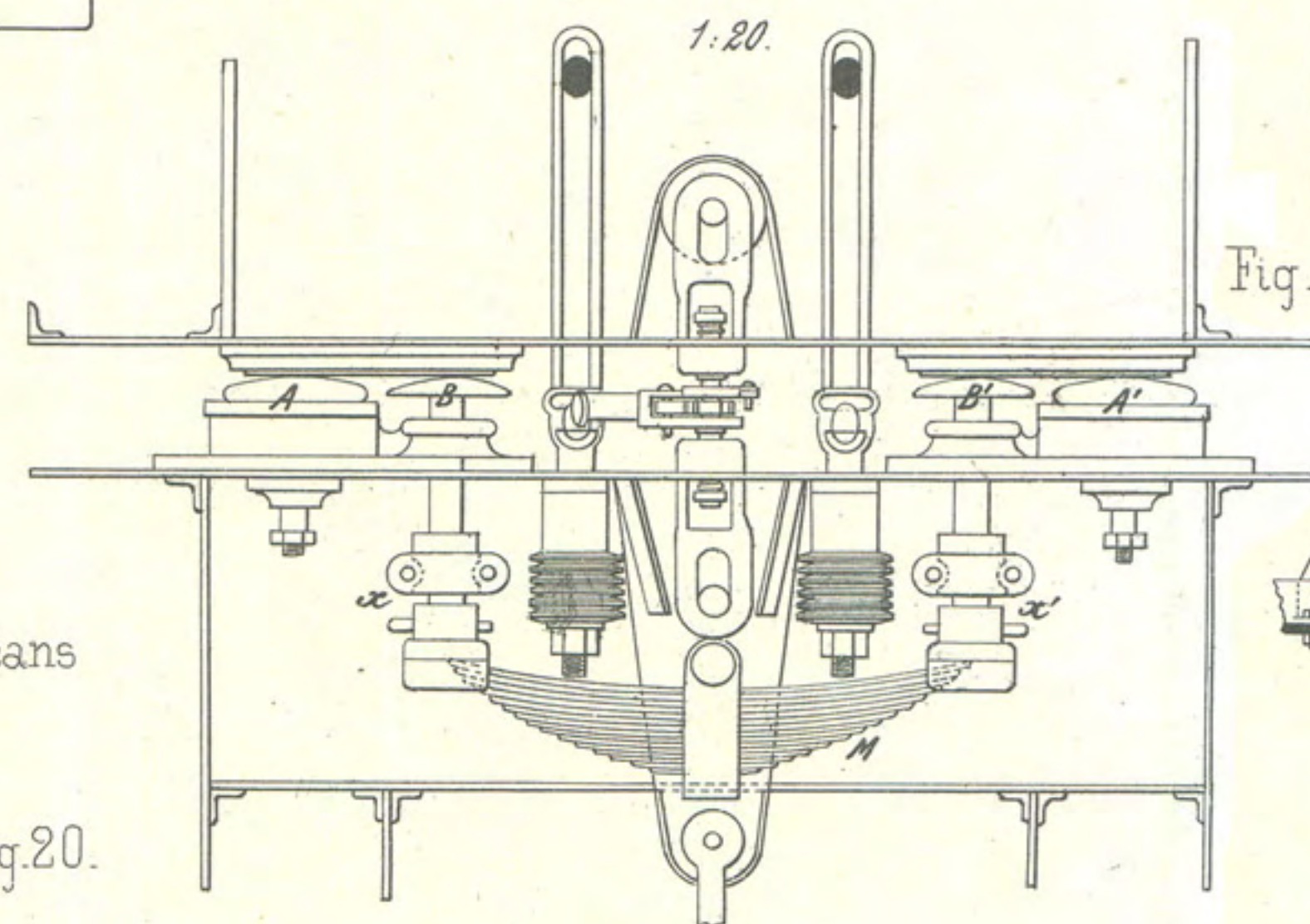


Fig. 13 et 14. Attelage du tender. Etat-Belge. 1:20.

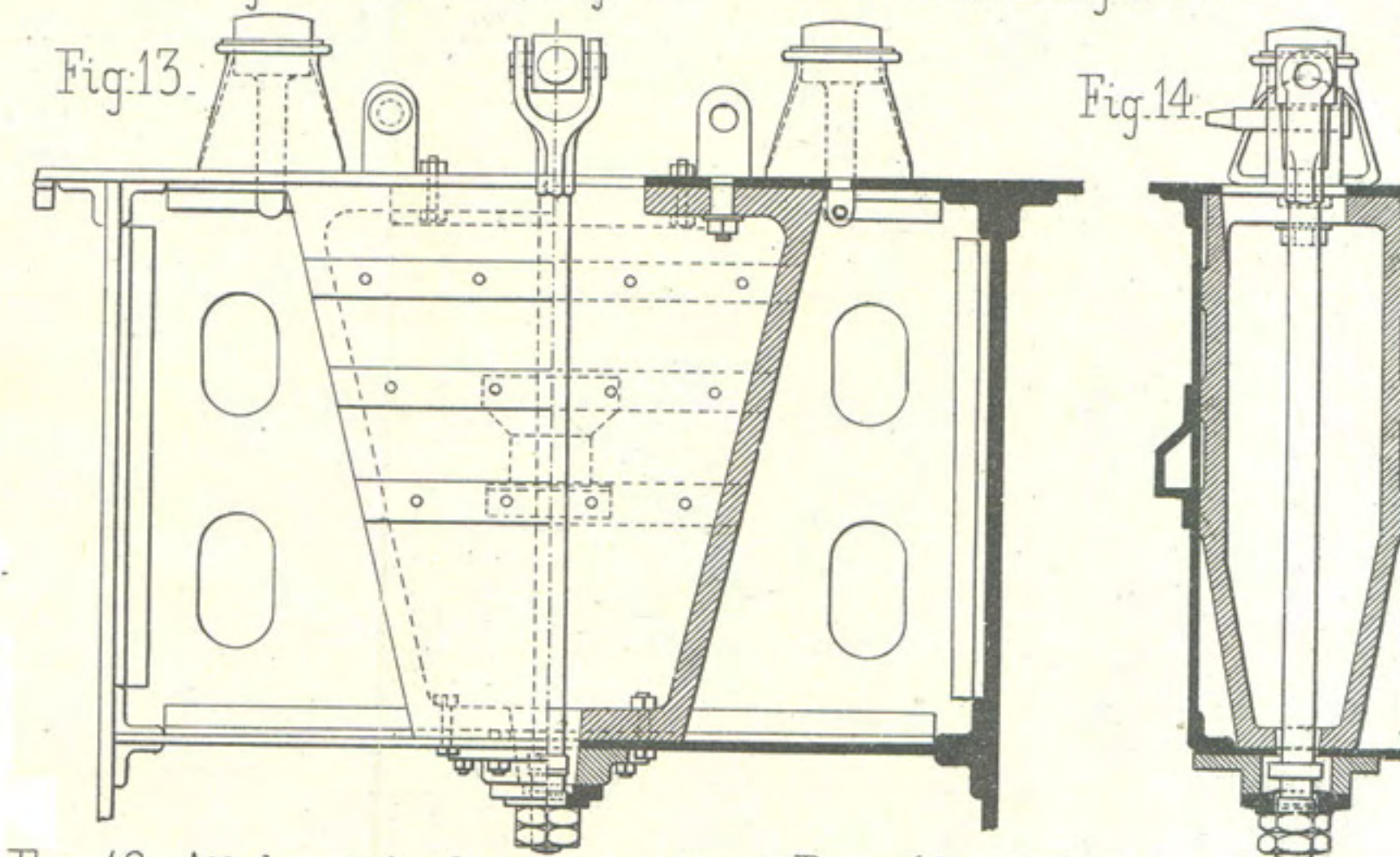


Fig. 16. Attelage du tender système Roy (Ouest français) 1:20.

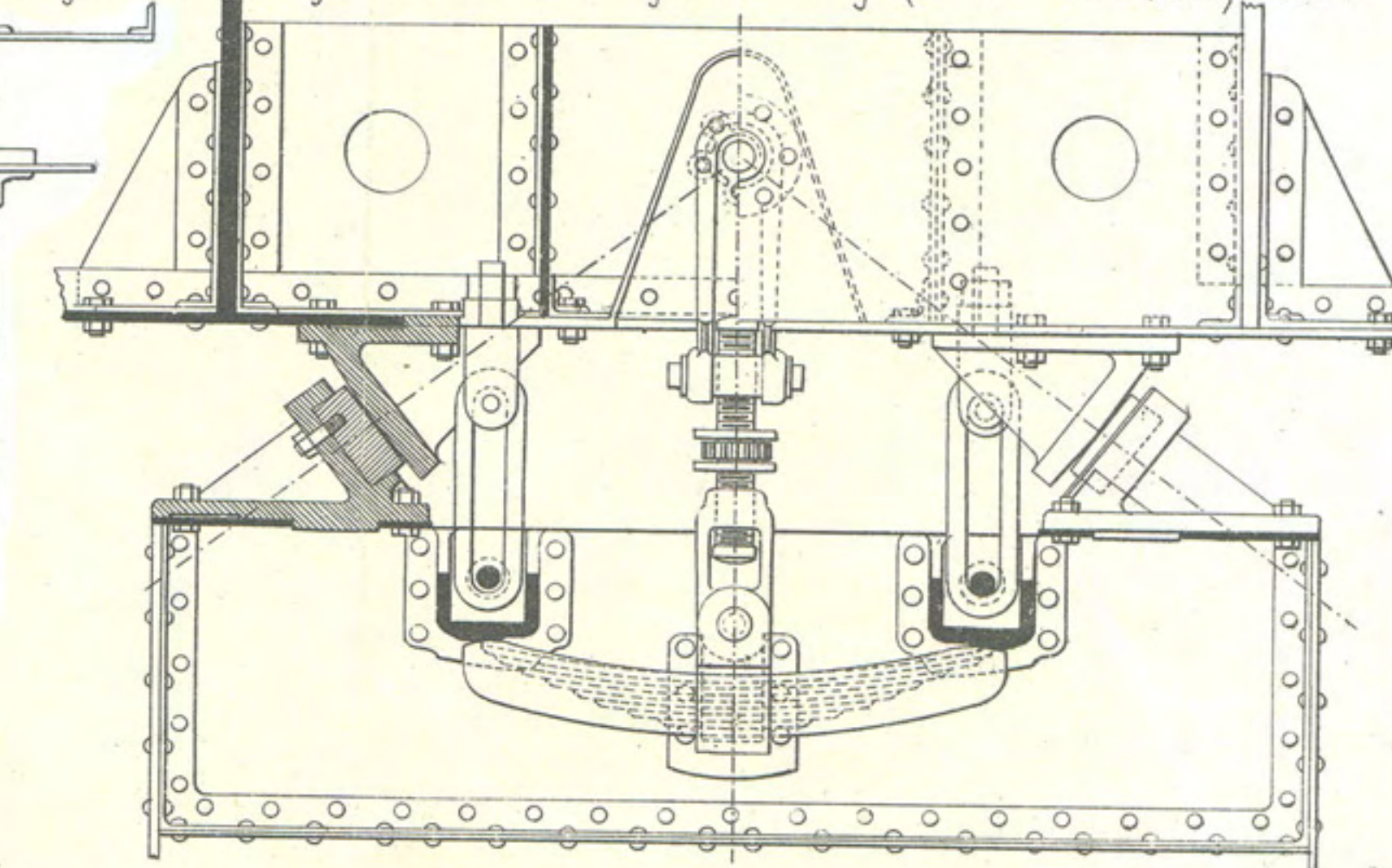


Fig. 6 et 7. Bogie des Ch. de fer méridionaux Italiens. 1:25.

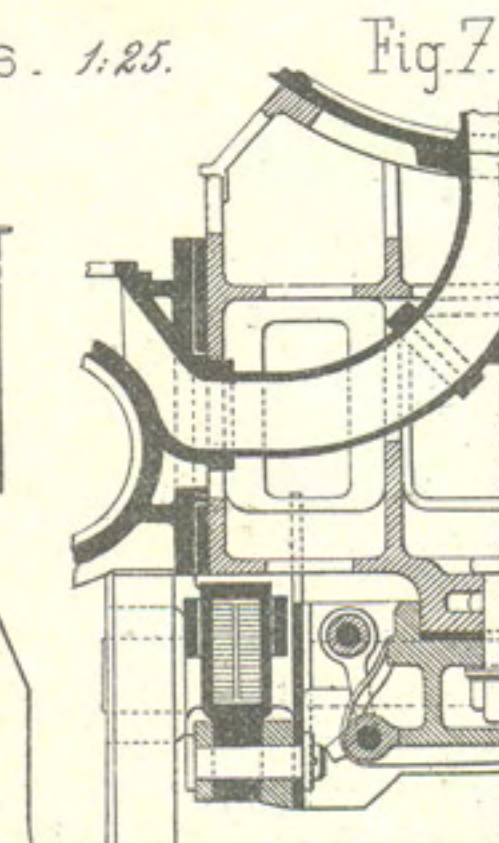
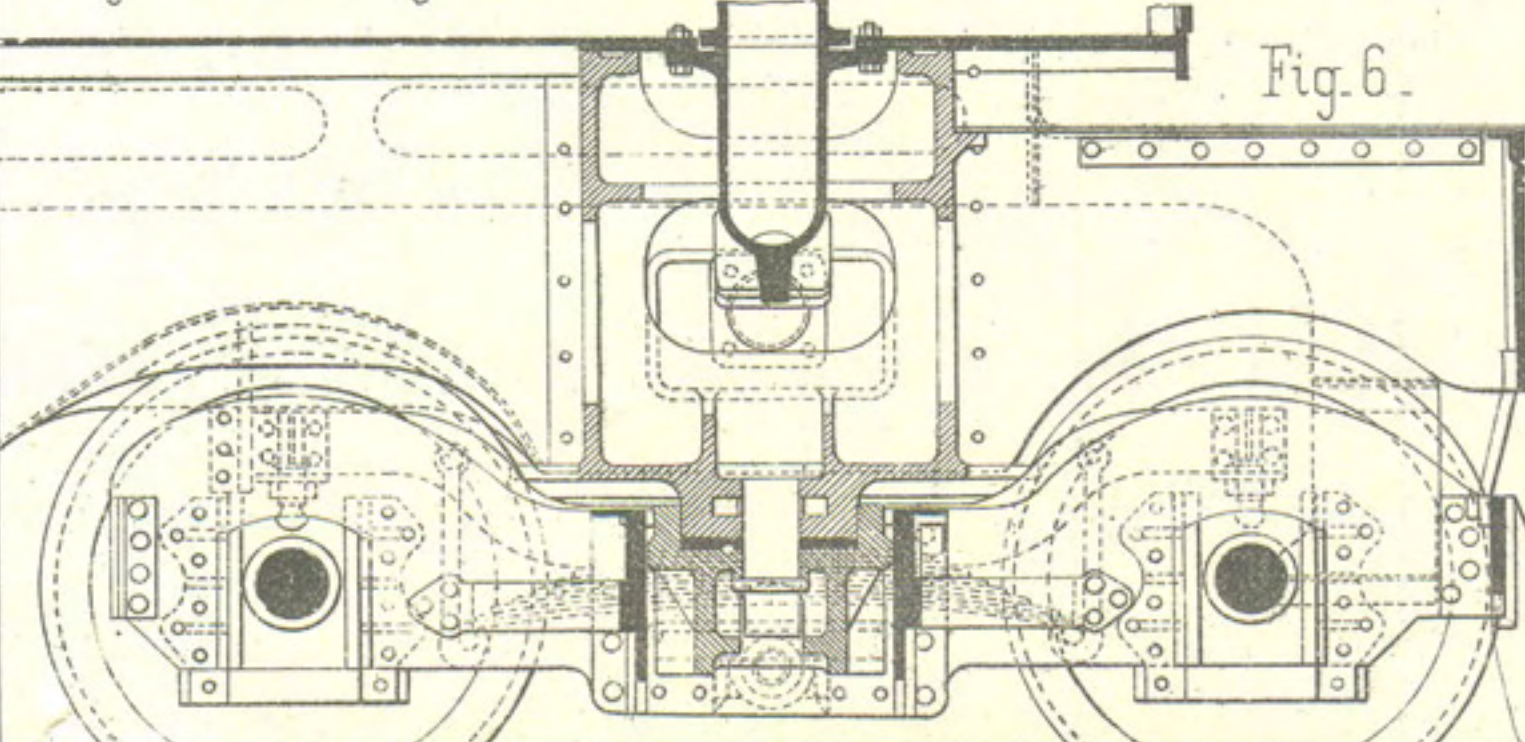


Fig. 4 et 5. Bogie des Ch. de fer Italiens de la Méditerranée.

Fig. 20 et 21. Attelage convergent du Paris-Orléans

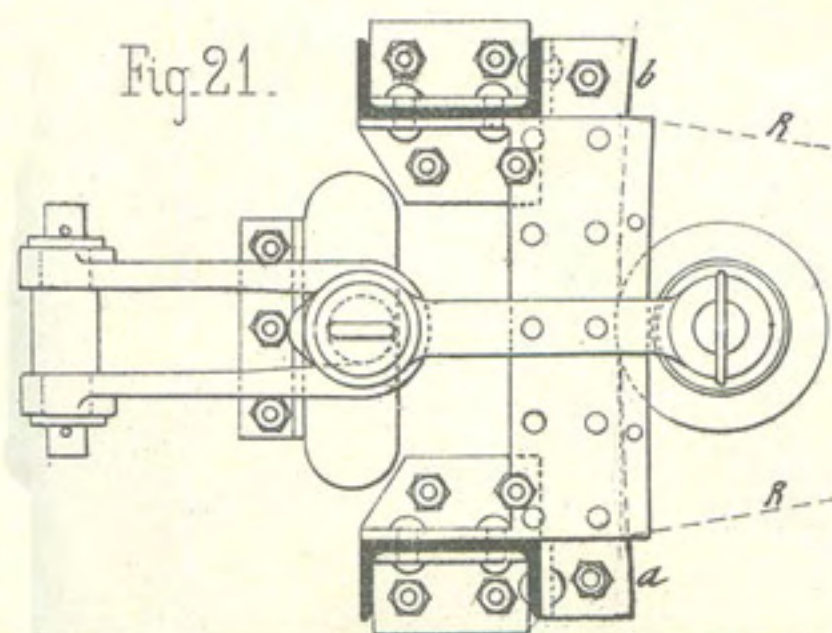
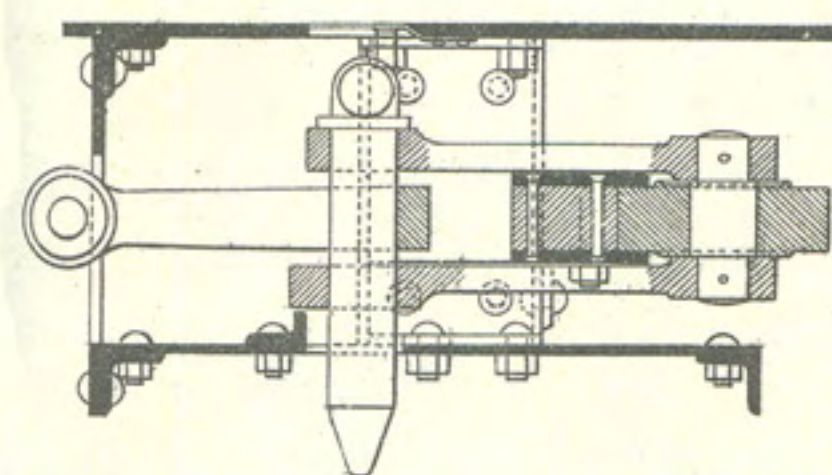


Fig. 17. Attelage Polonceau.

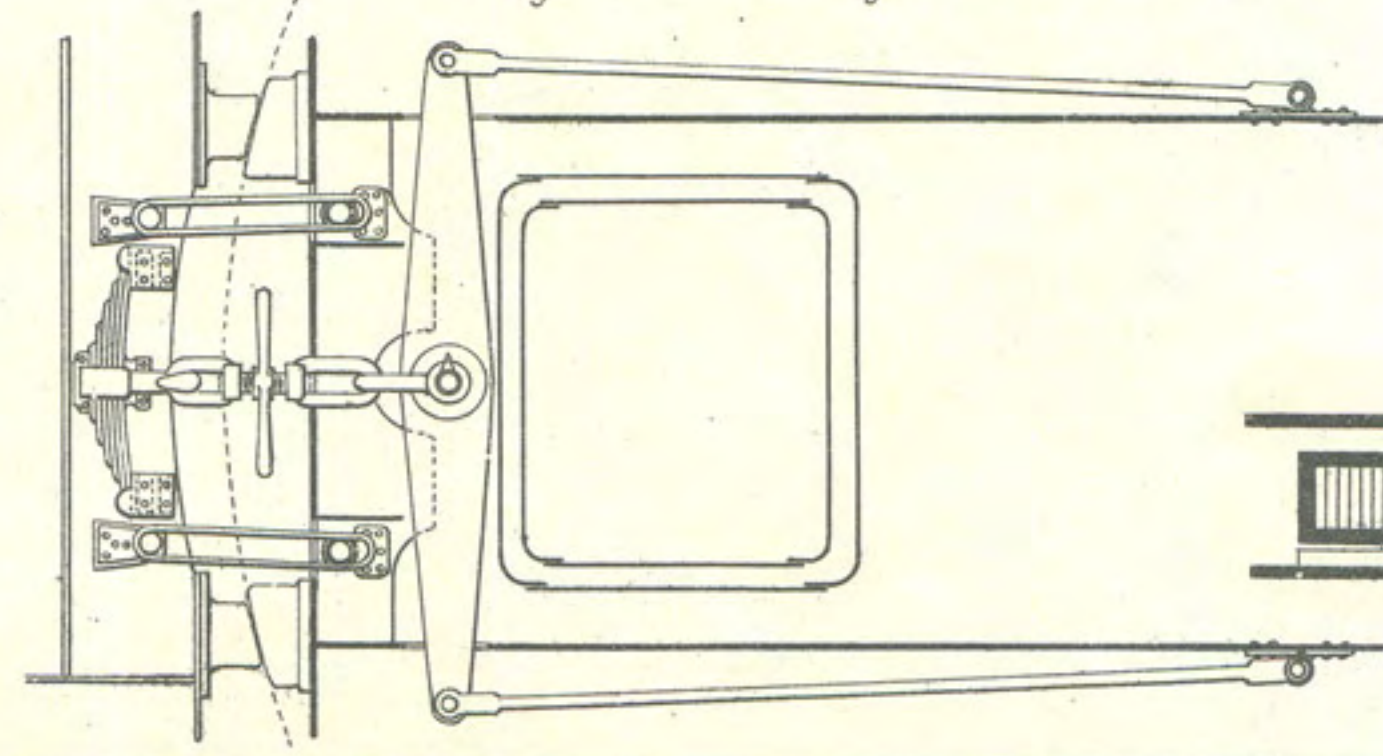
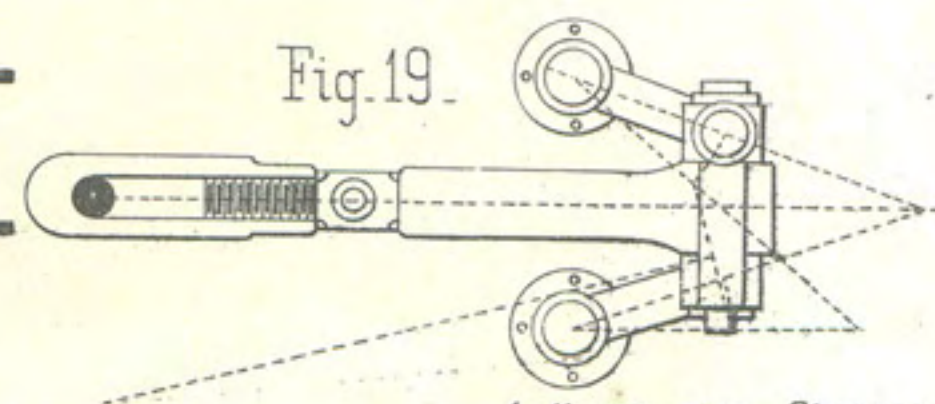
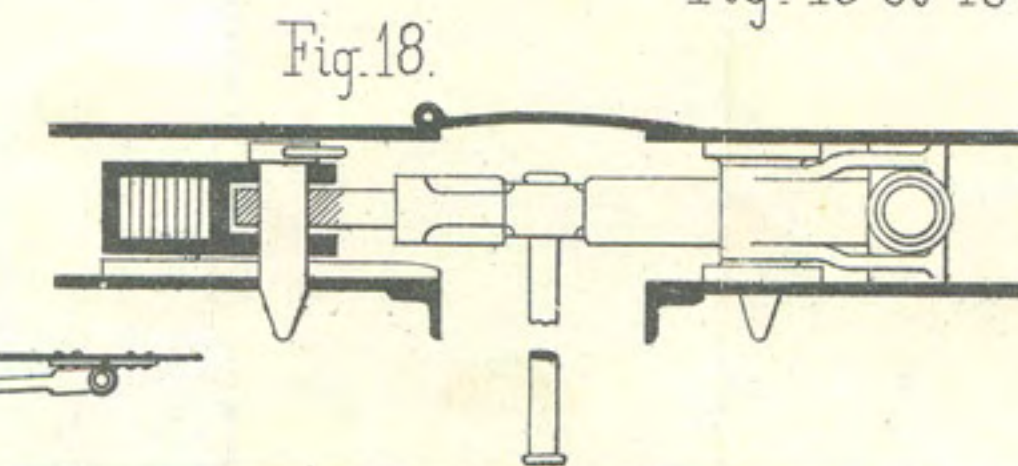


Fig. 18 et 19. Attelage Stradal.





Appareil de démarrage des Compound.

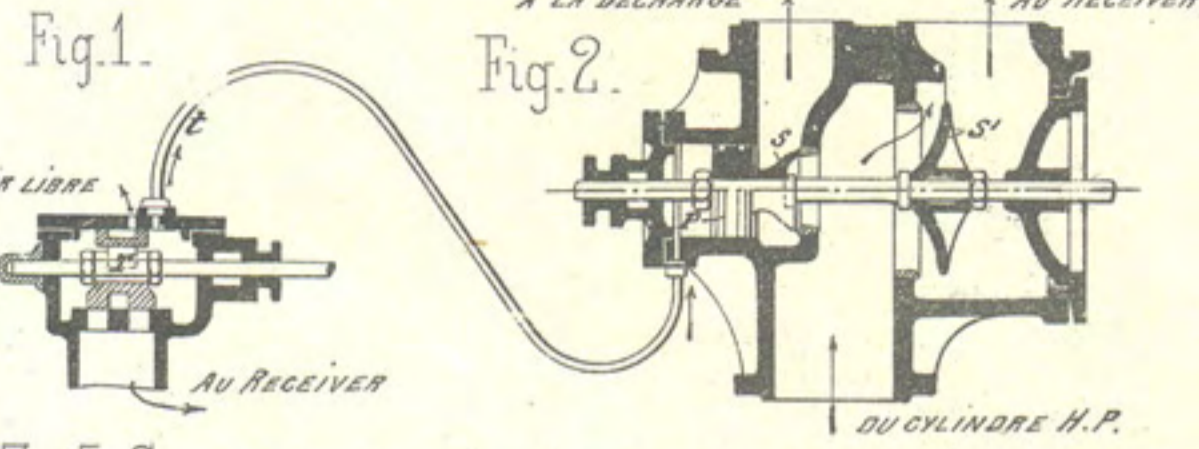


Fig. 6. Appareil Polonceau pour la condensation.

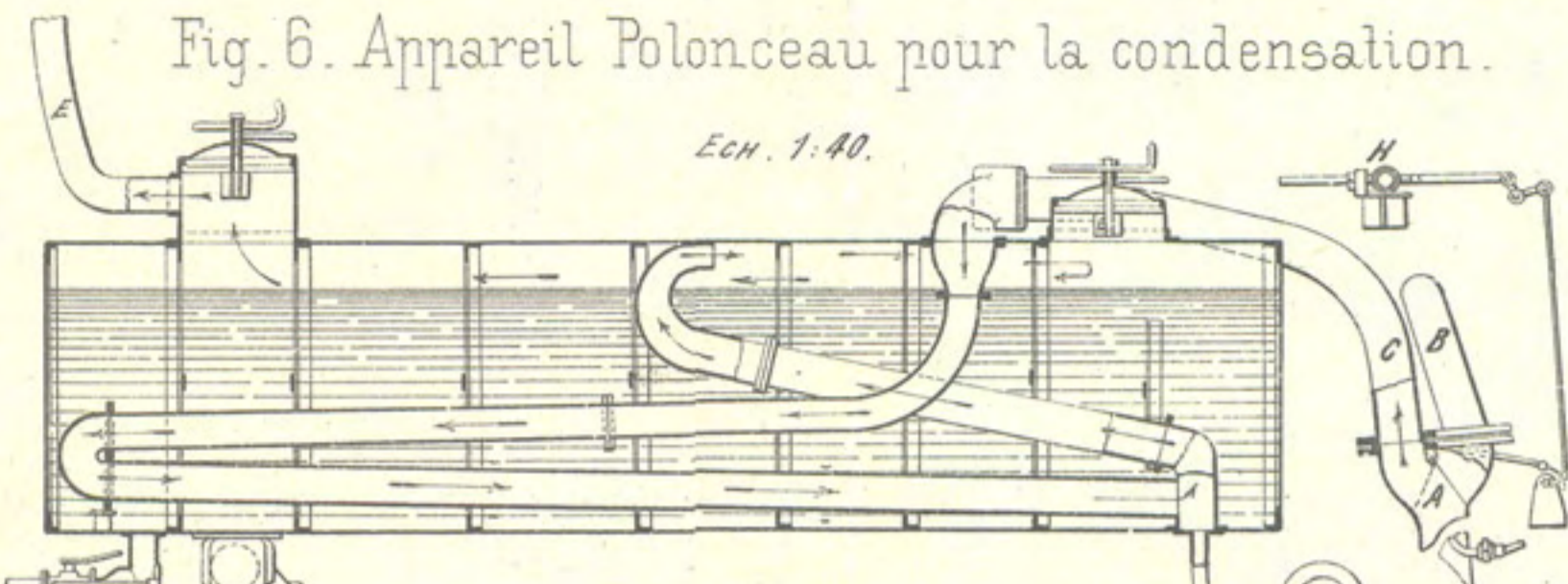


Fig. 7 et 8. Tender à 3 essieux de 14000 litres. Etat-Belge. ECH. 3:100.

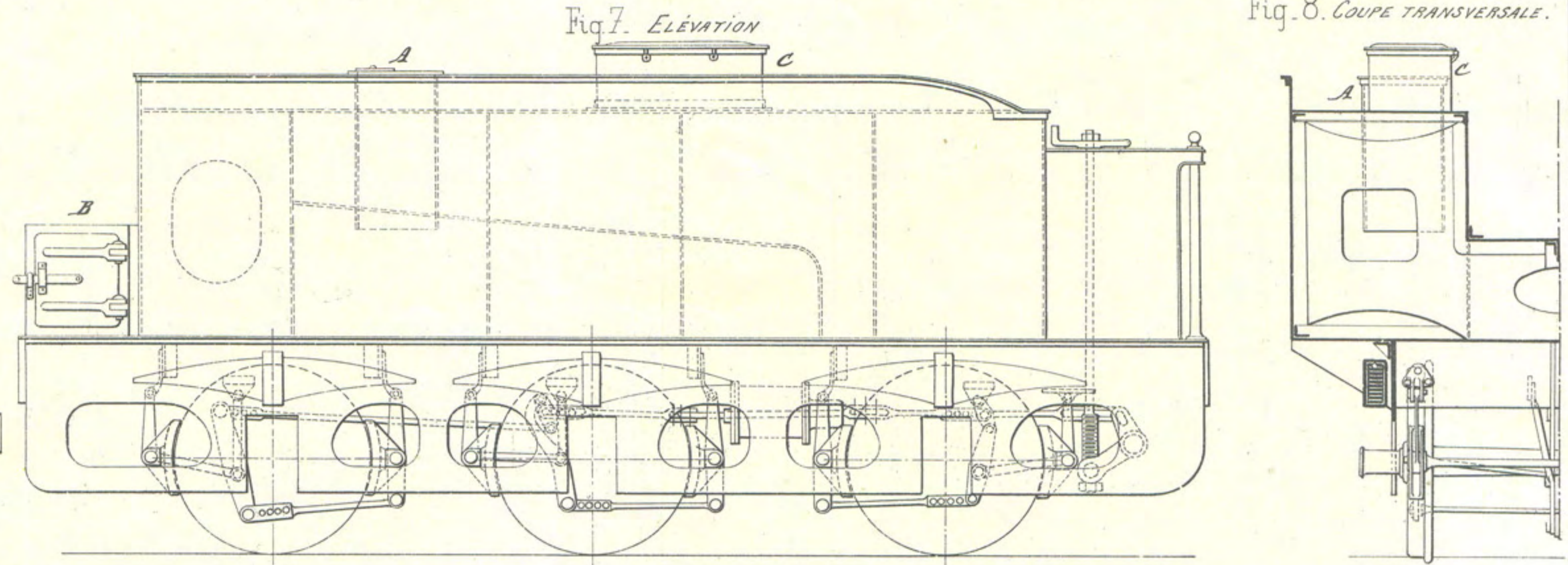


Fig. 3 à 5. Soutes à eau des locomotives-tenders. ECH. 1:30.

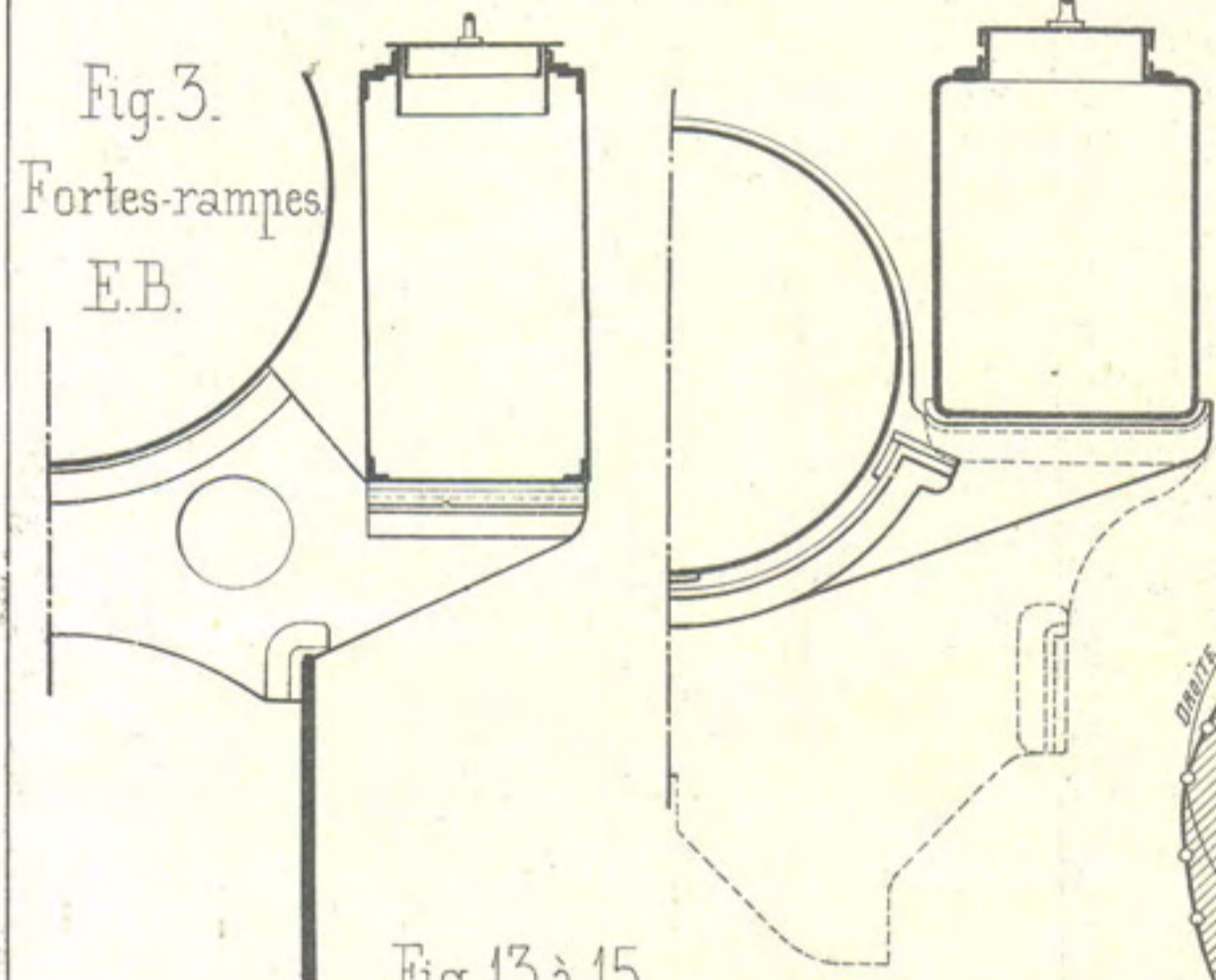


Fig. 5. Loc. de gare EB.

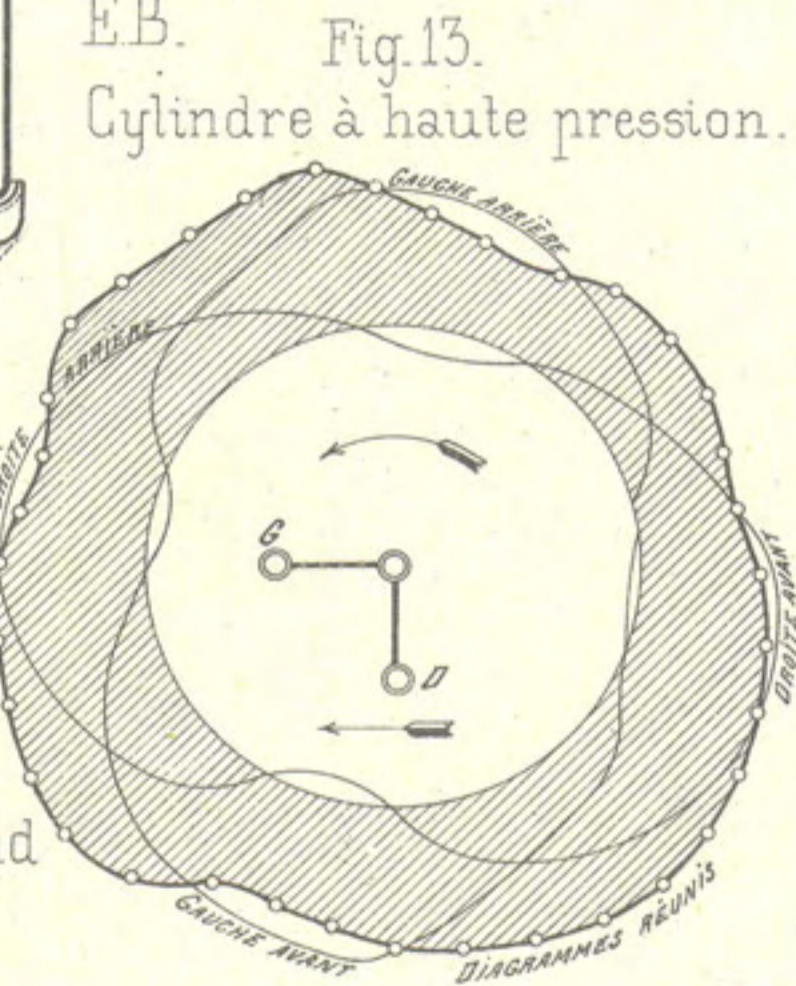
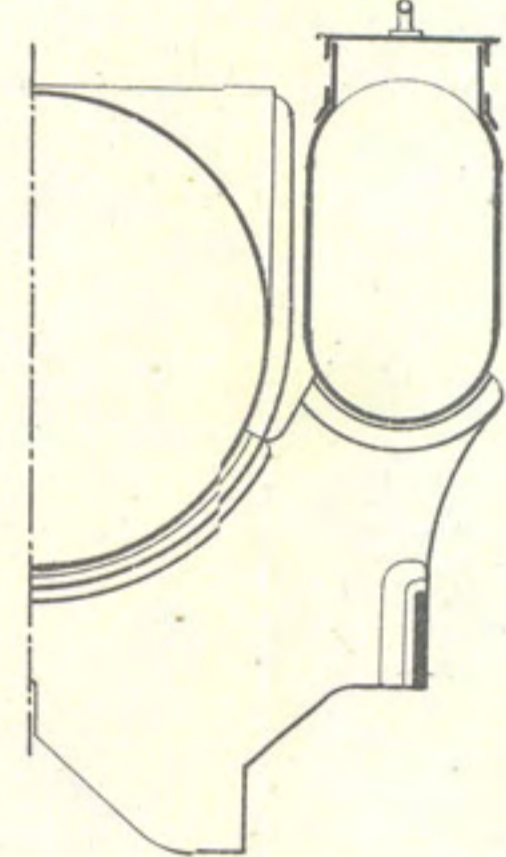


Fig. 14. Cylindre à basse pression.

Fig. 13 à 15. Diagrammes de l'effort de traction d'une Compound à 4 cylindres.

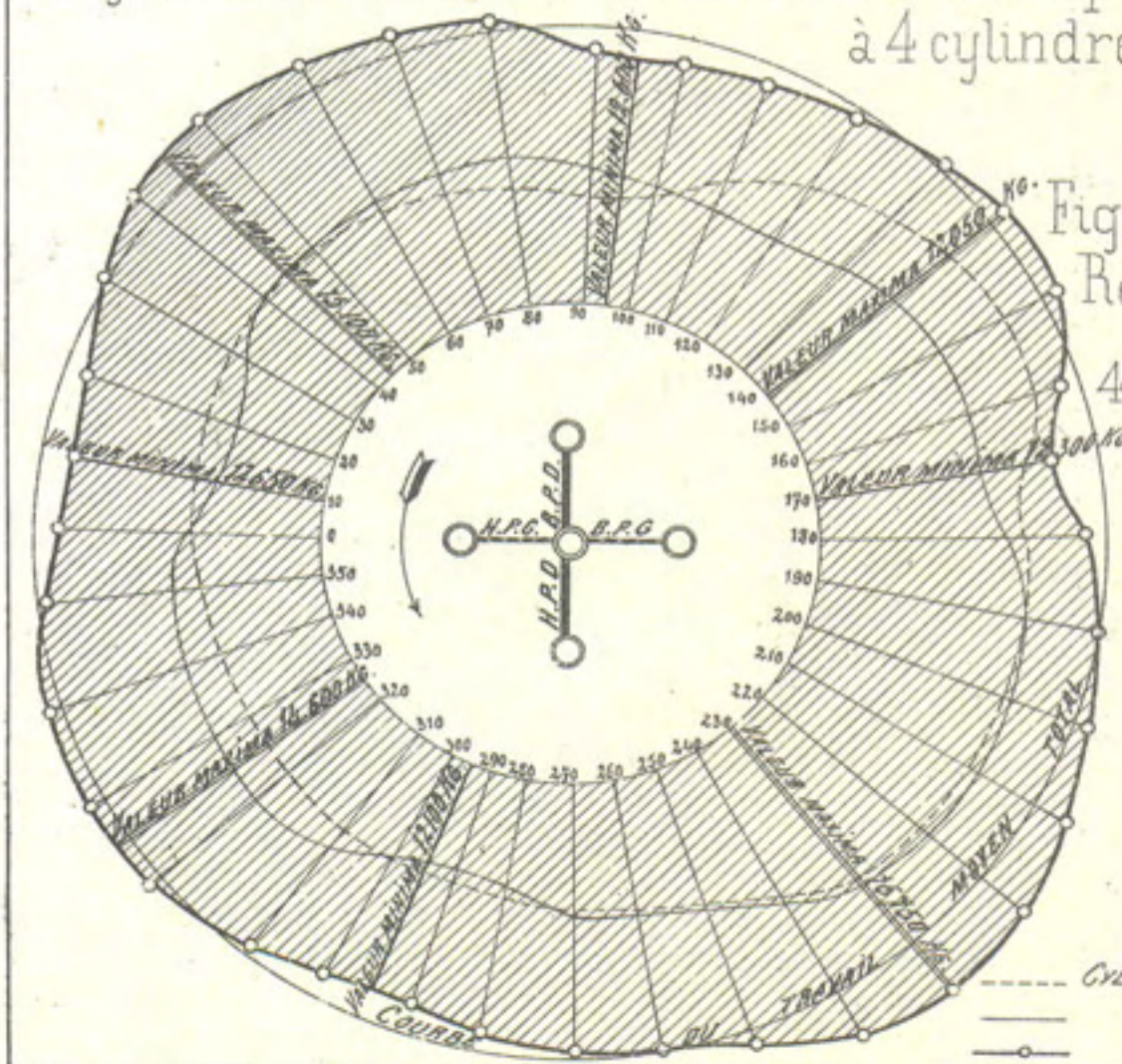


Fig. 15. Réunion des 4 cylindres.

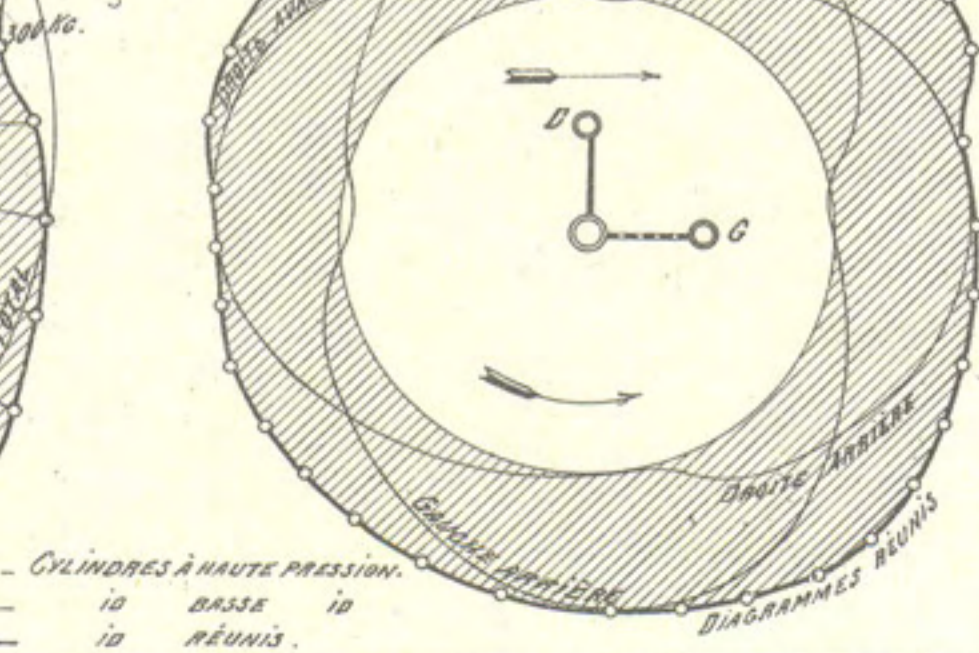


Fig. 16.

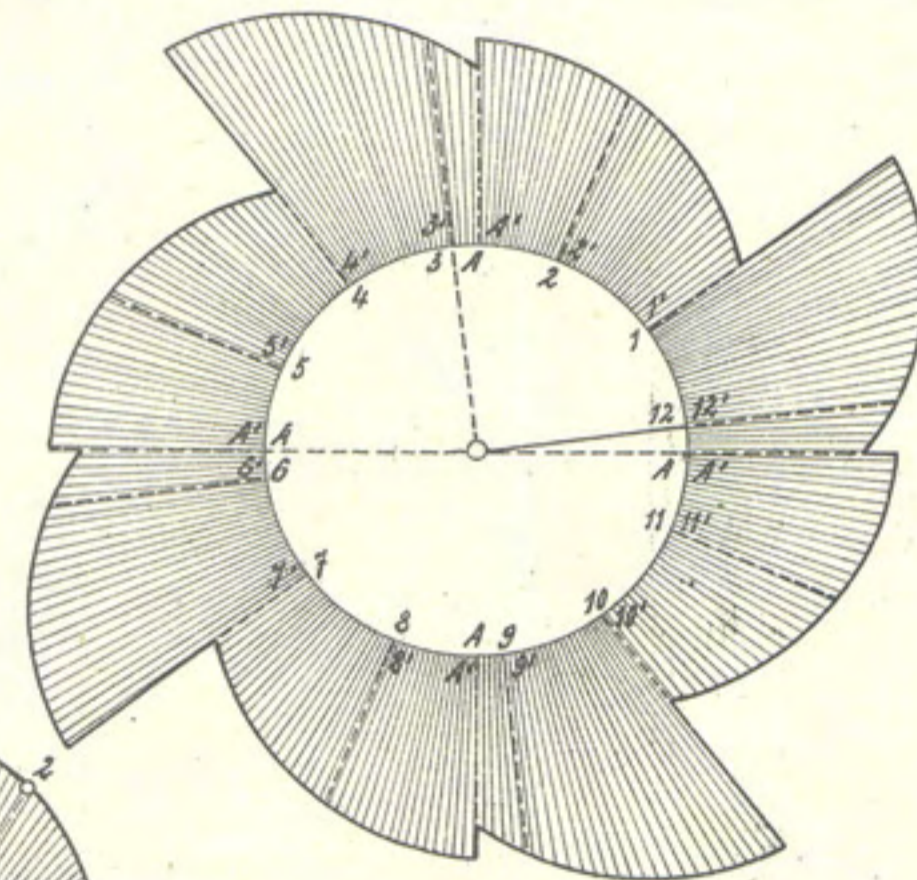


Fig. 16. Effort de démarrage d'un piston.

Fig. 17.

Fig. 17. Effort de démarrage des 2 pistons.

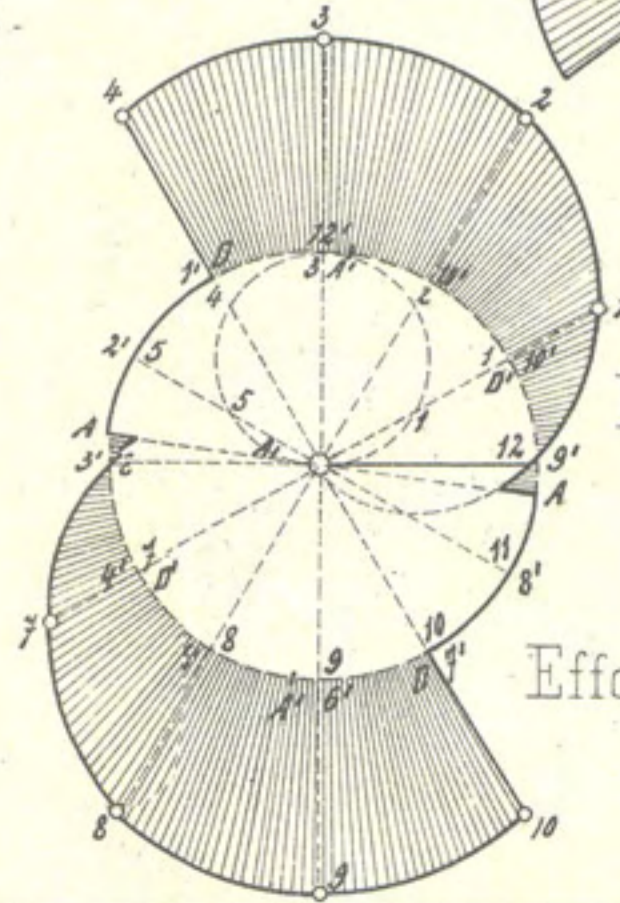


Fig. 9. Disposition des soutes à charbon.

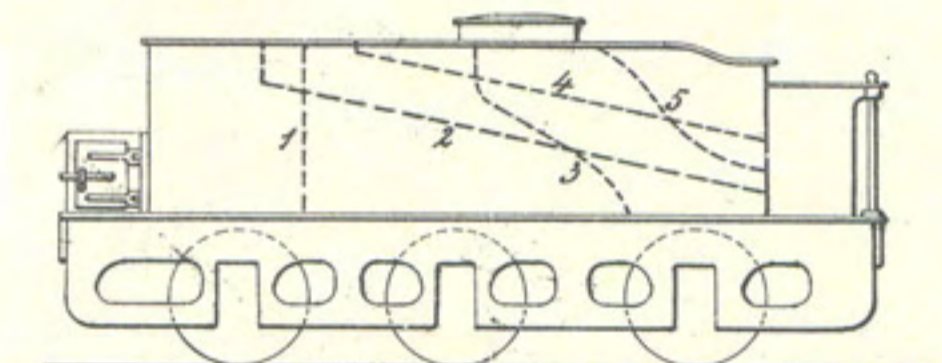


Fig. 10.

Fig. 10. Dimensions relatives des cheminées.

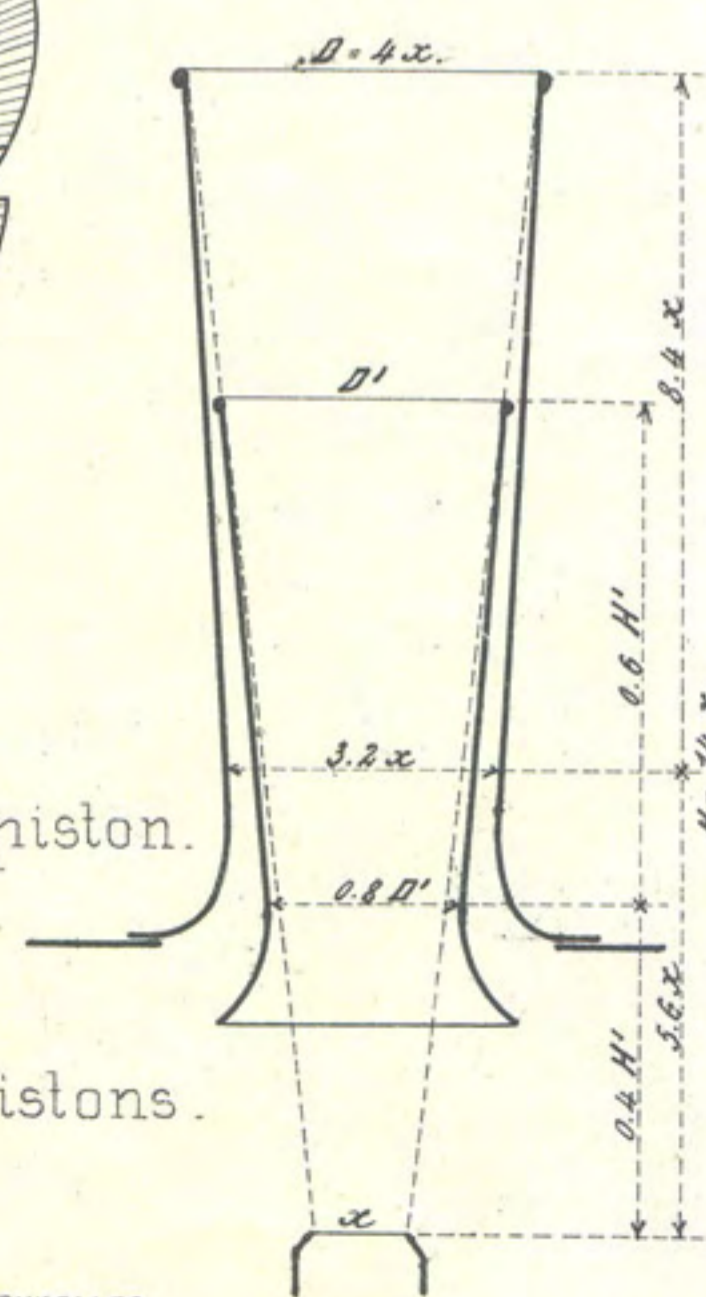


Fig. 11.

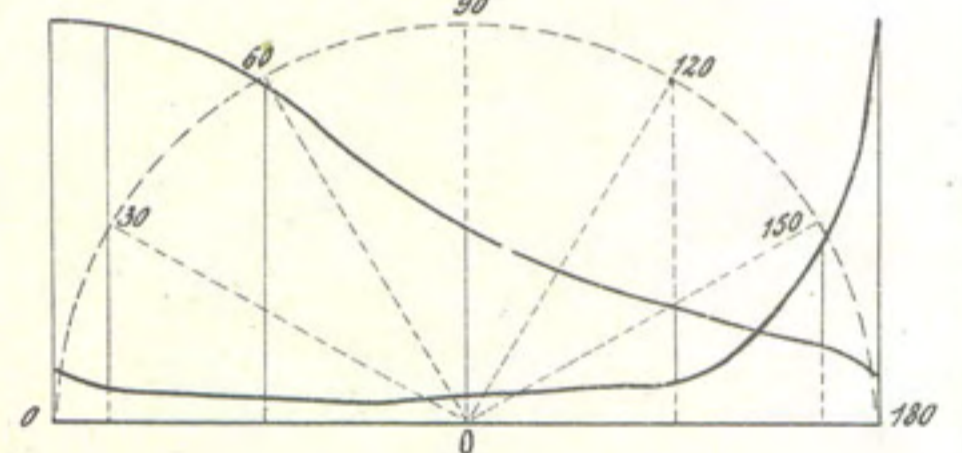
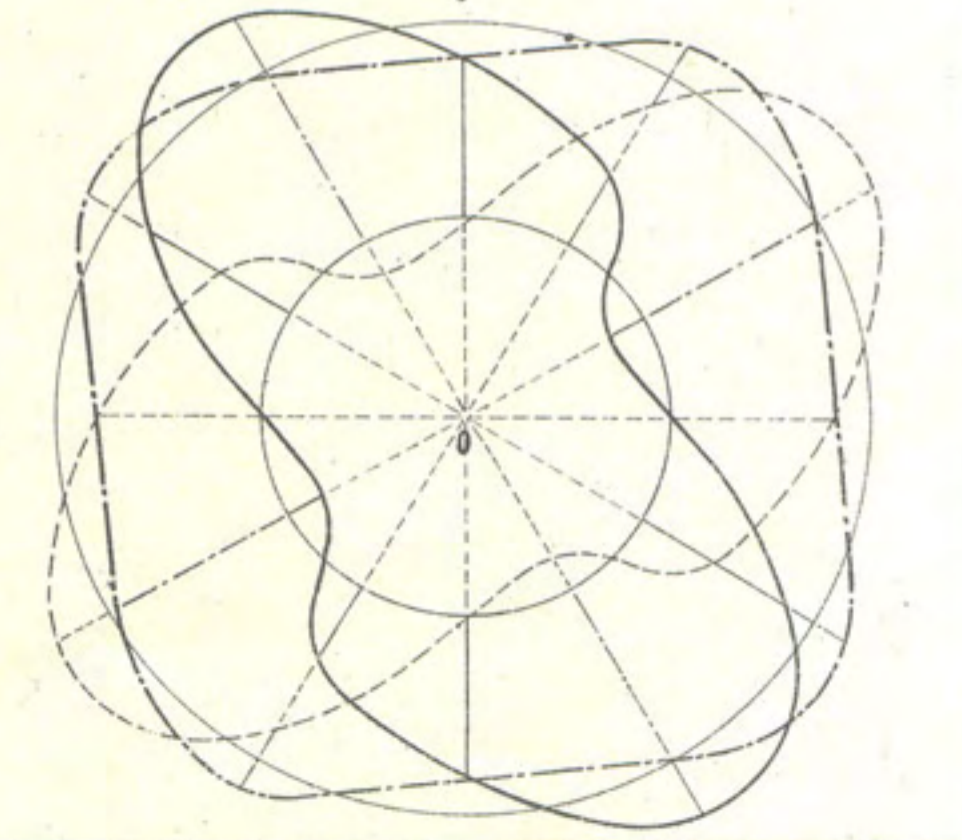


Fig. 12.

Fig. 11 et 12. Diagramme de l'effort de traction dans une loc. ordinaire.



- PISTON DE DROITE.
- - - id GAUCHE.
- - - LES DEUX RÉUNIS.
- EFFORT MOYEN.

Fig. 1 à 6. Diagrammes des mouvements de lacet et de tangage.

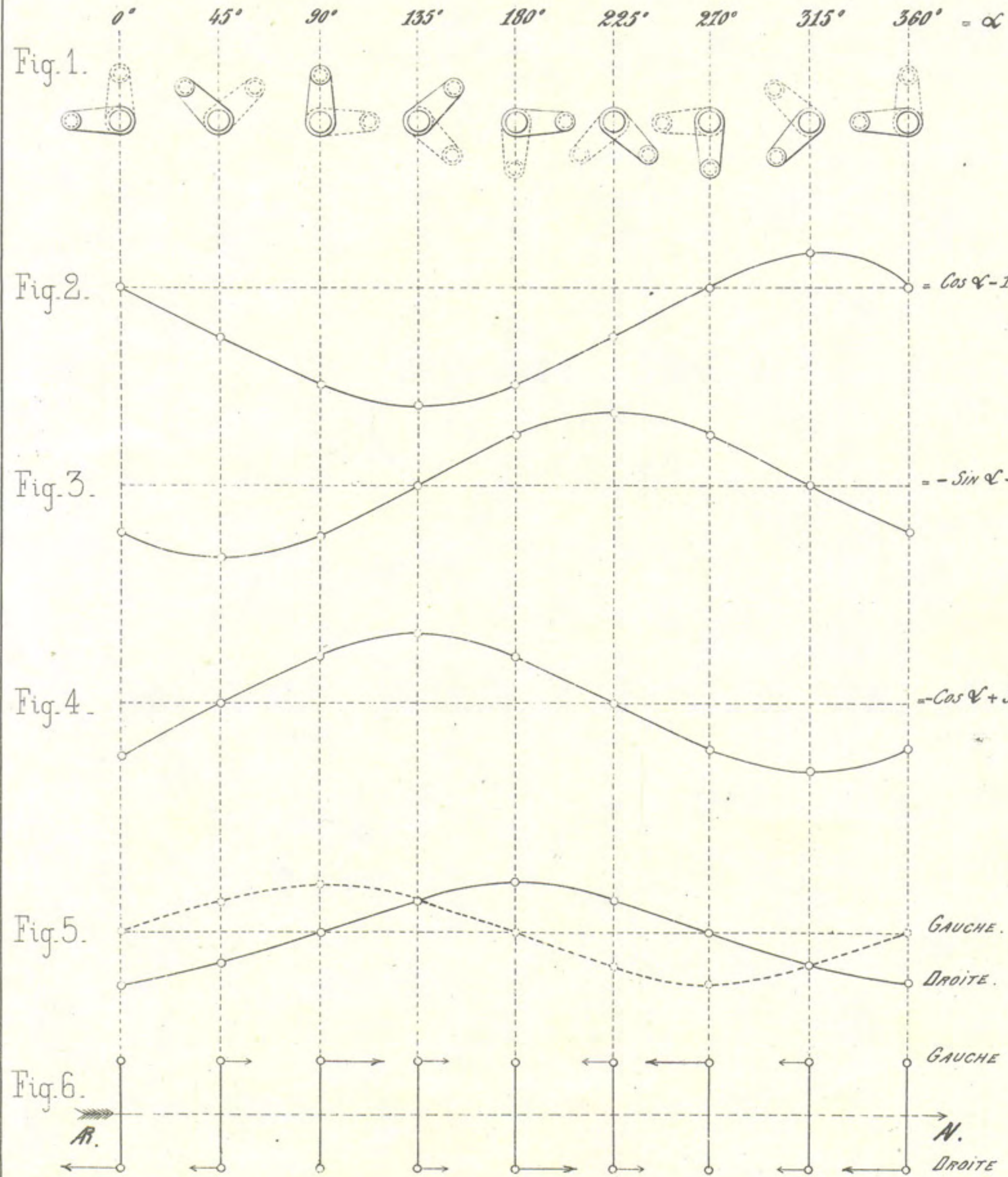


Fig. 7 à 9. Influence de l'inclinaison des cylindres.

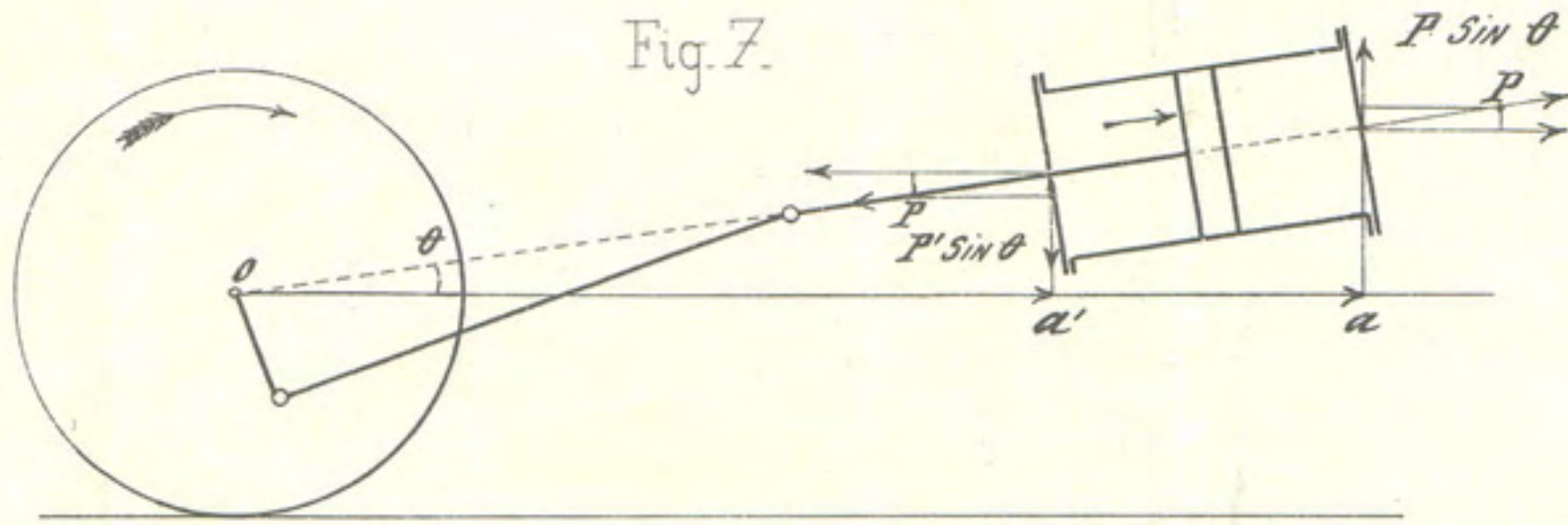


Fig. 8.

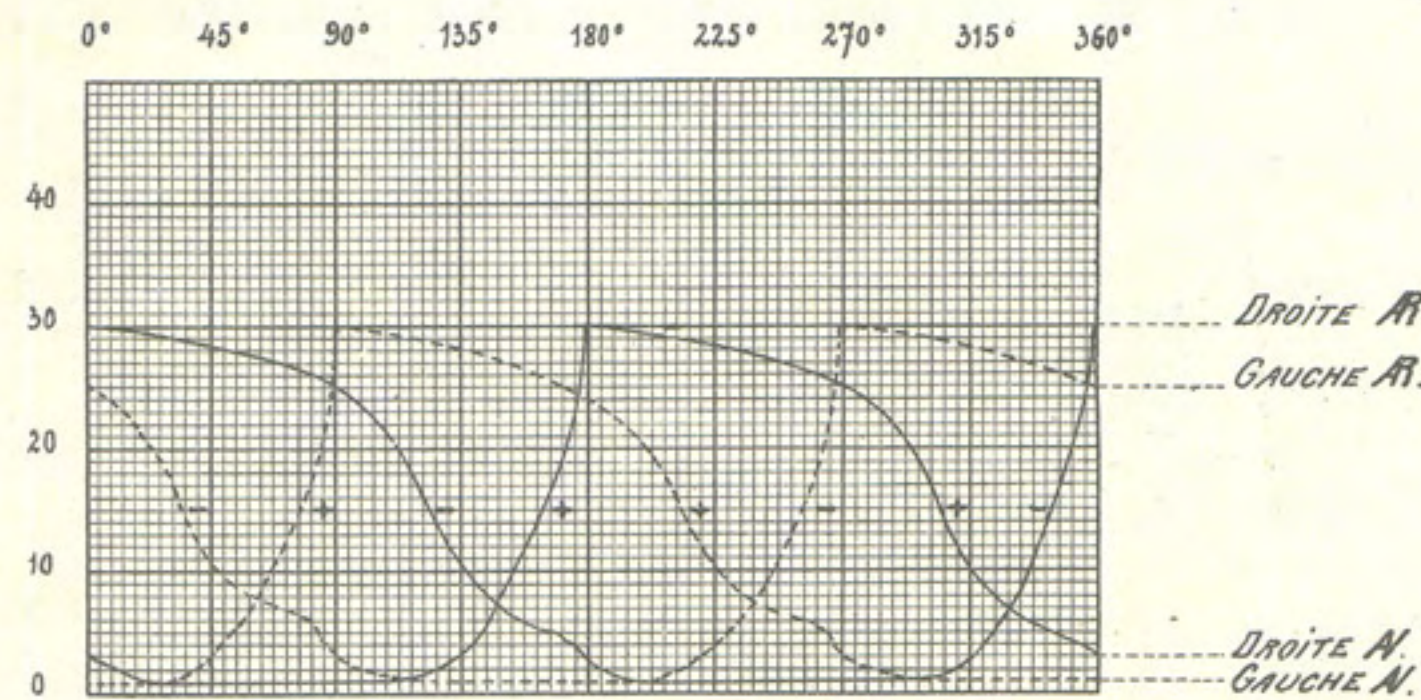


Fig. 9.

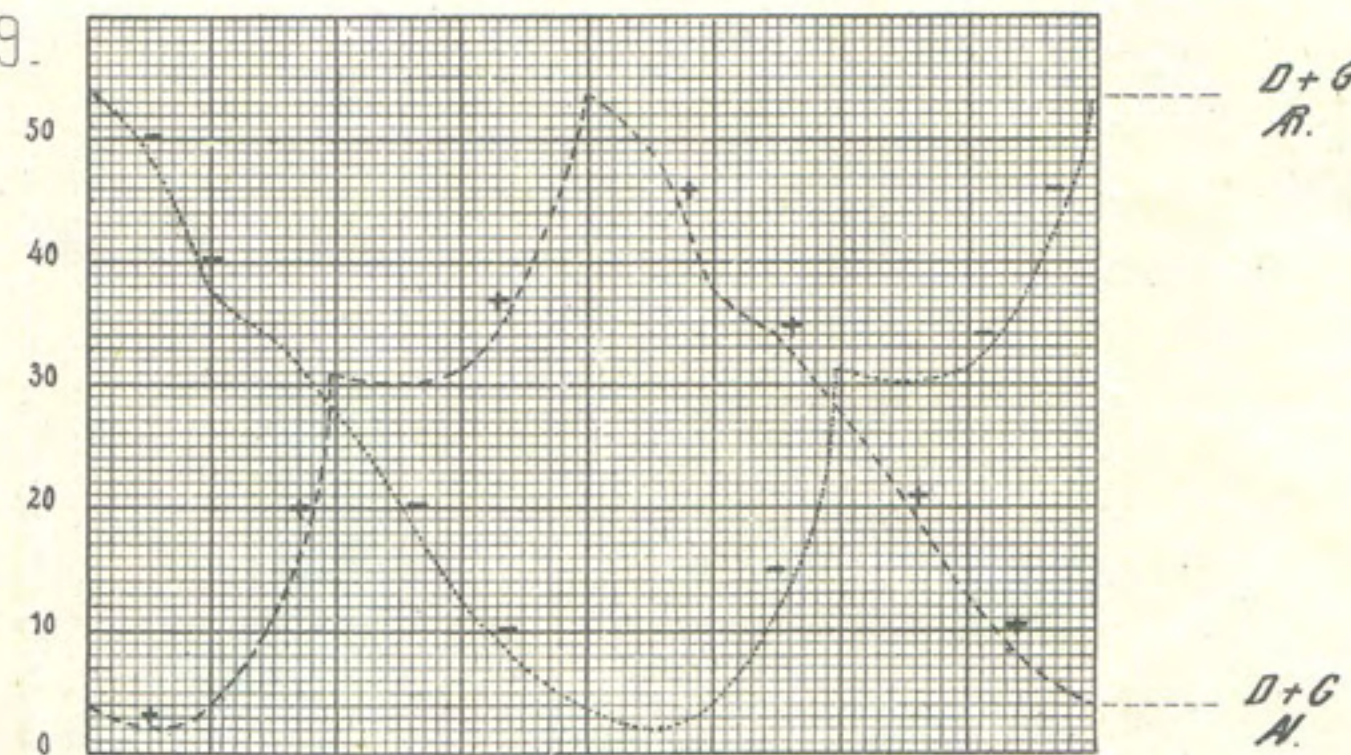


Fig. 13 et 14. Position des contrepoids Machine à cylindres intérieurs.

Fig. 10 à 12 Influence de l'obliquité des bielles.

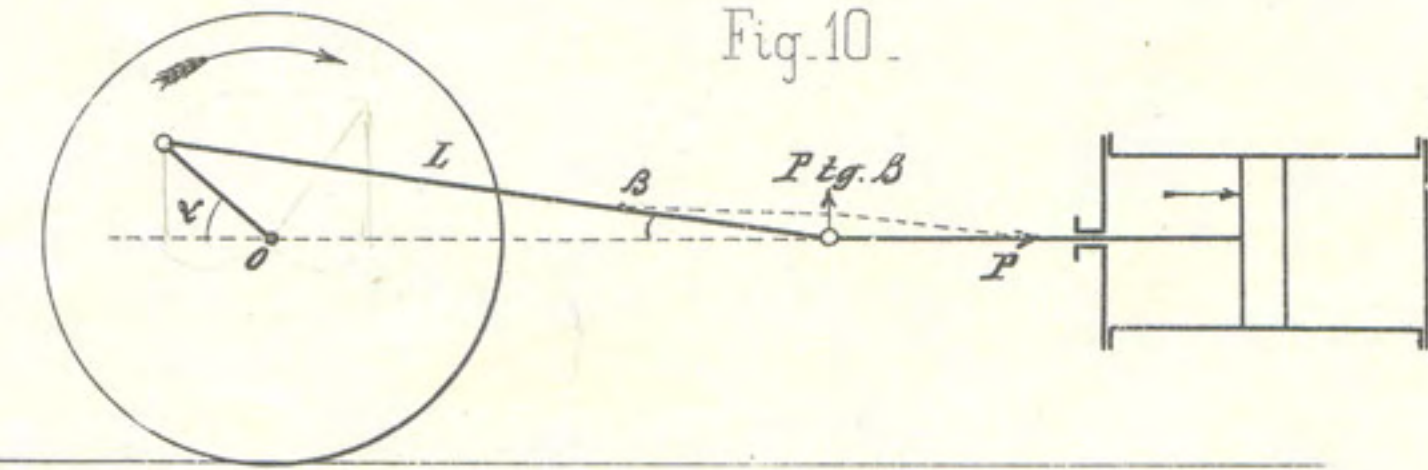


Fig. 11.

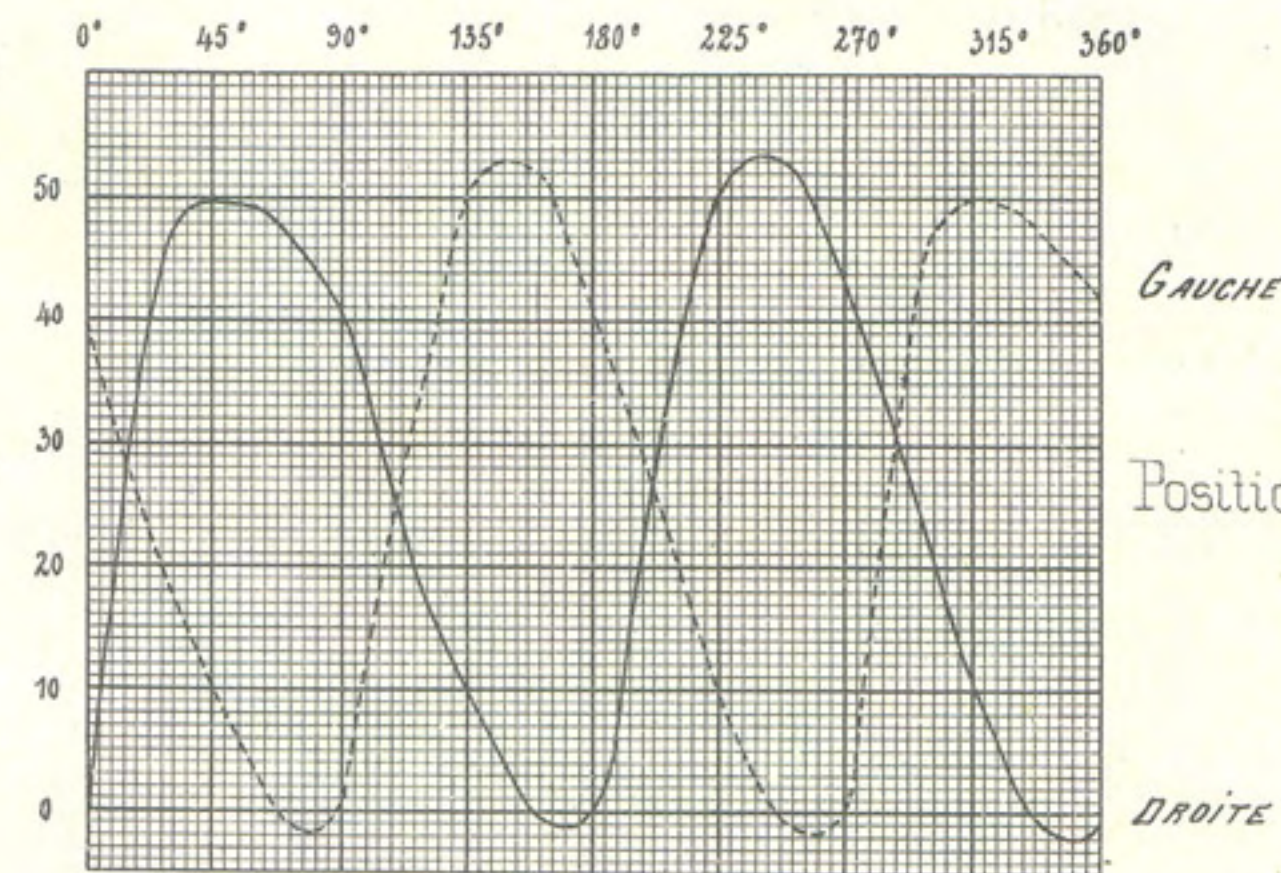


Fig. 12.

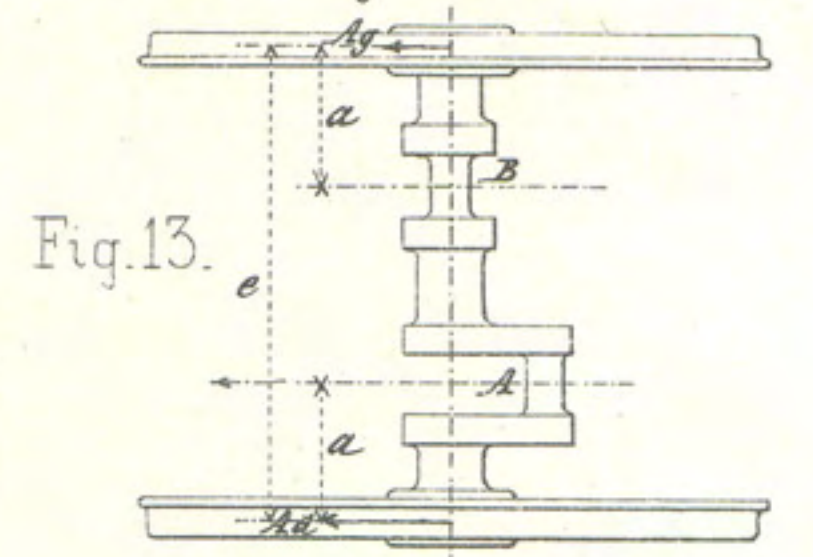
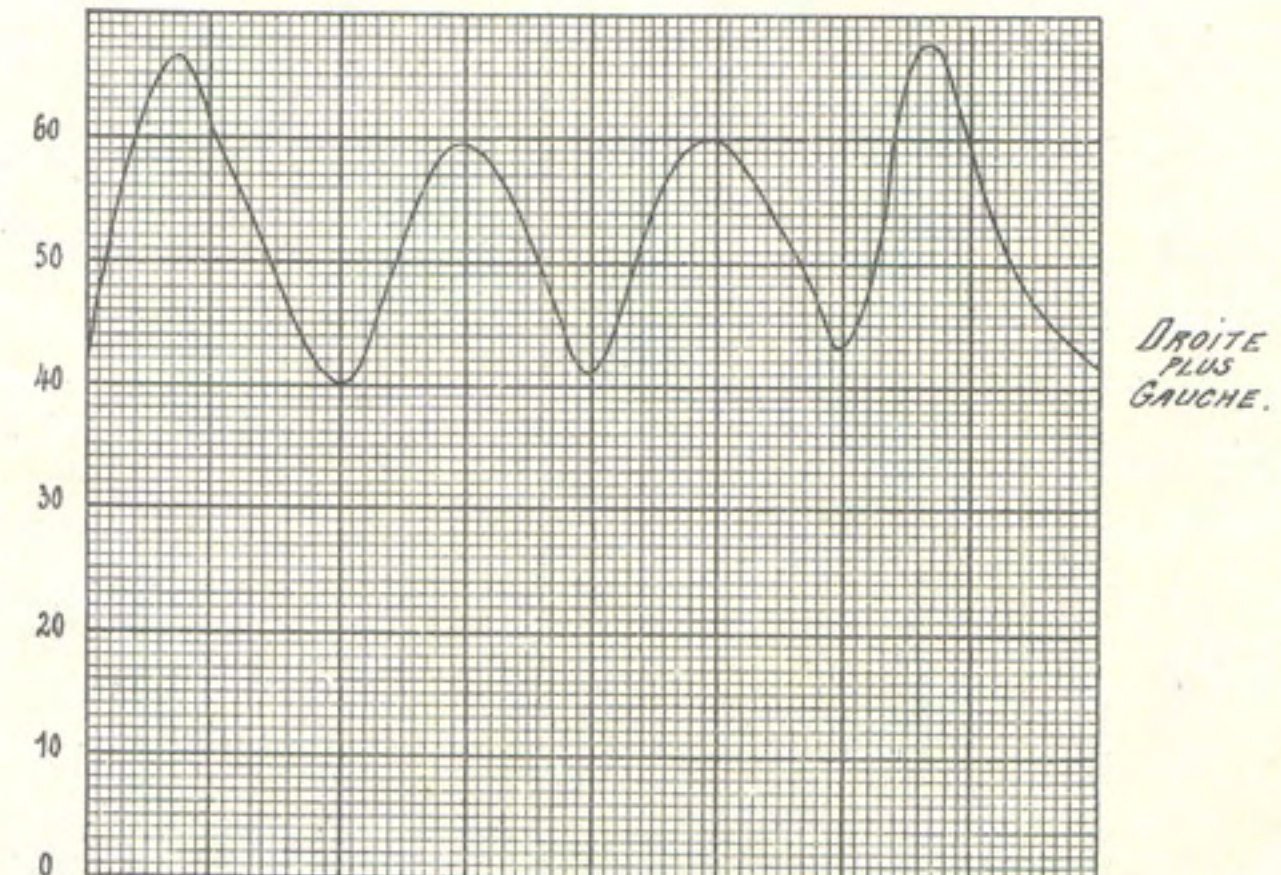


Fig. 14.

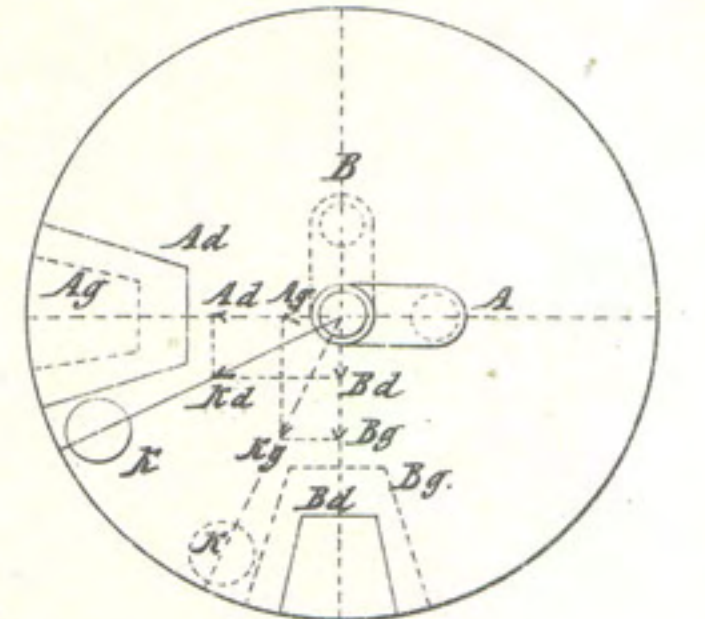


Fig. 15 et 16. Position des contrepoids Mach. à cylindres extér.

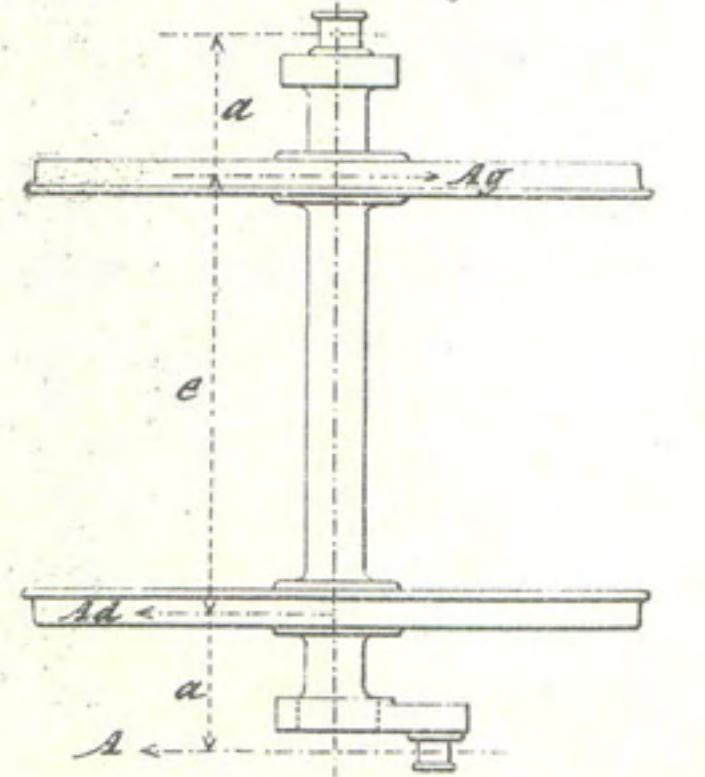
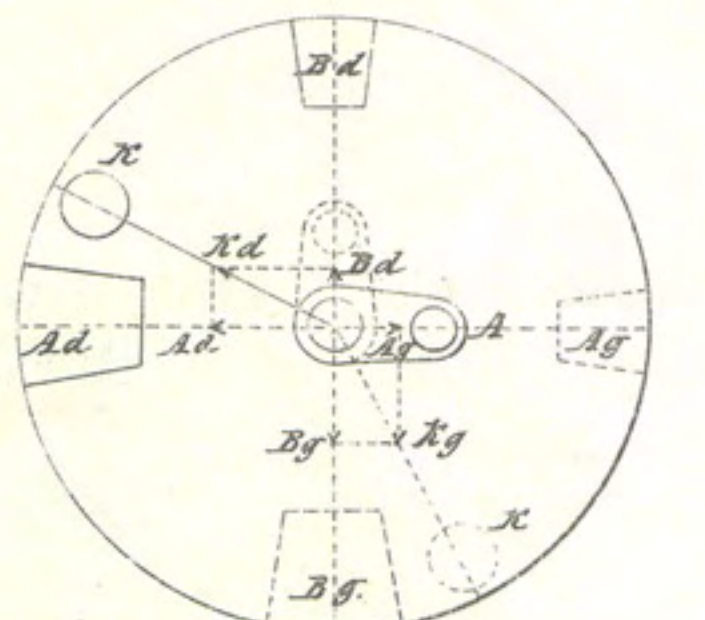
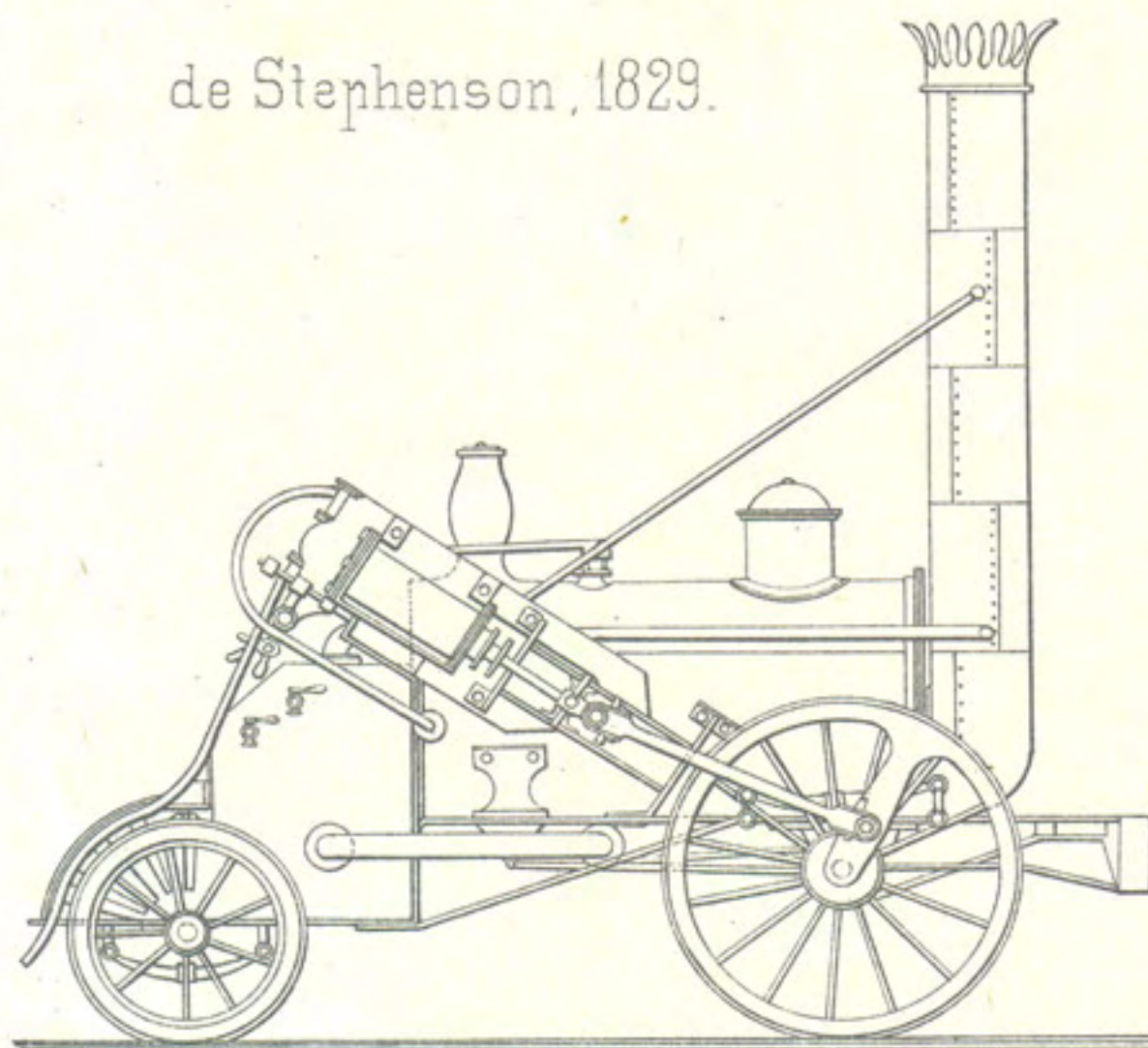


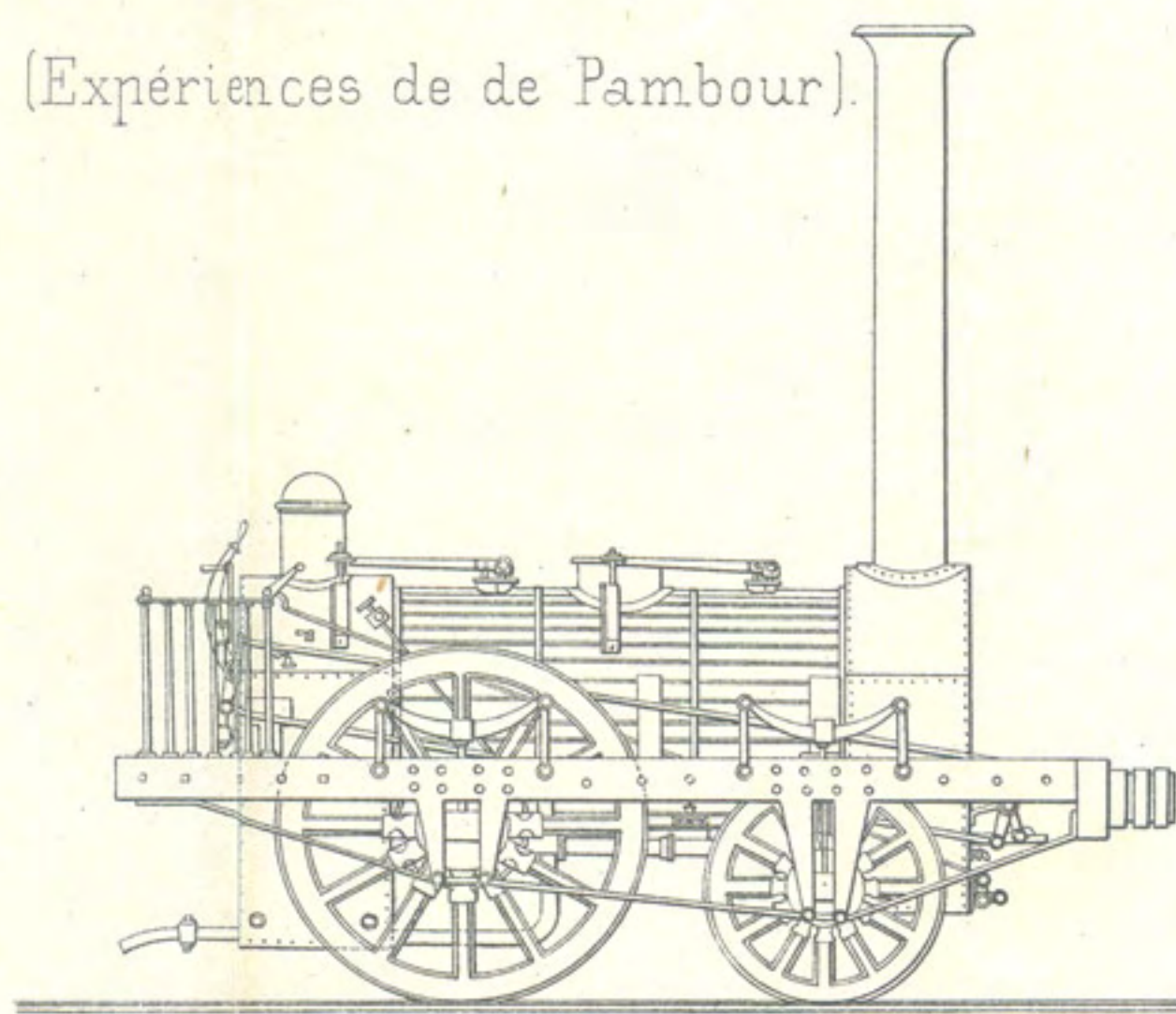
Fig. 16.



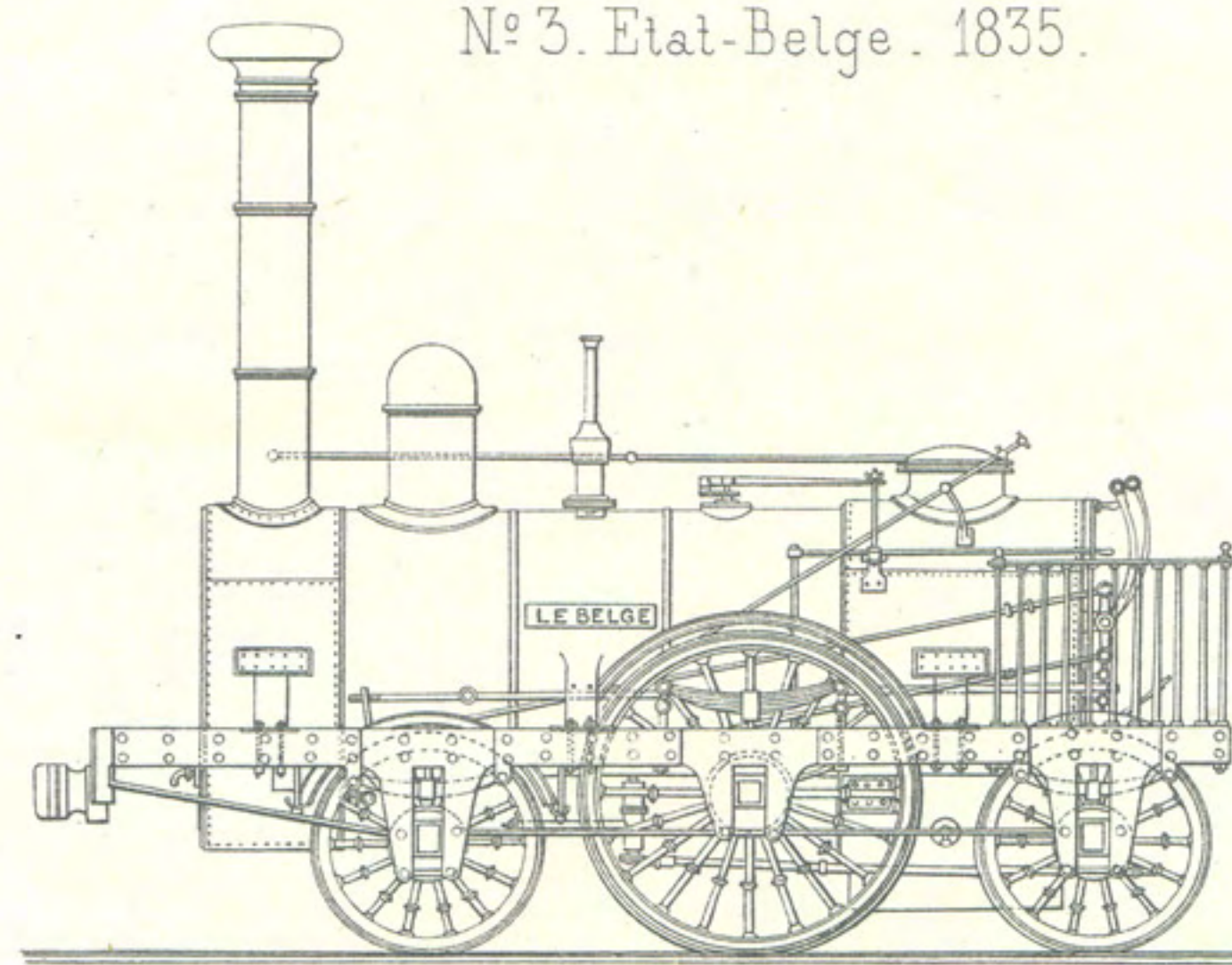
N°1. La Fusée (Rocket)  
de Stephenson, 1829.



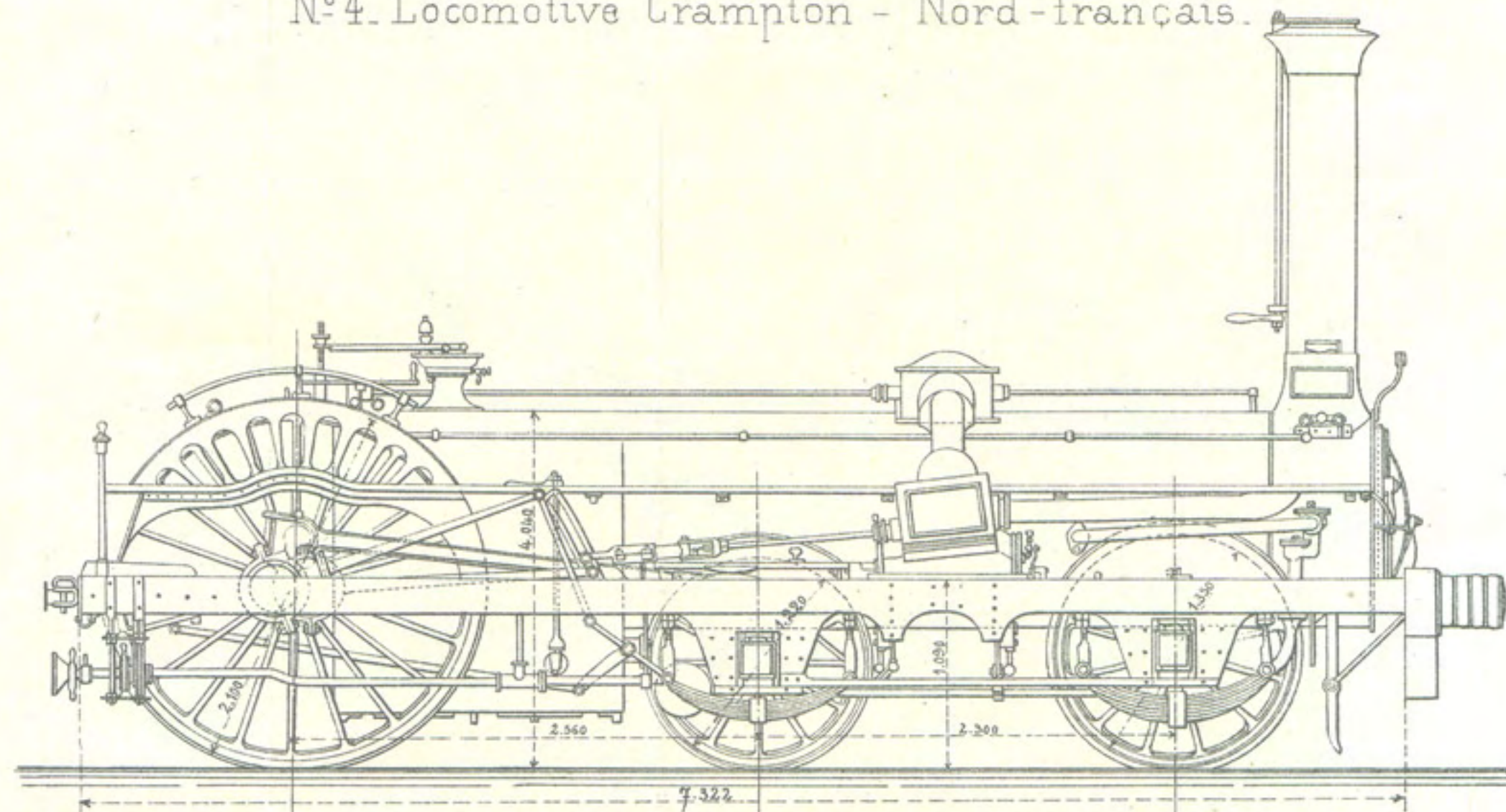
N°2. Liverpool à Manchester.  
(Expériences de de Pambour).



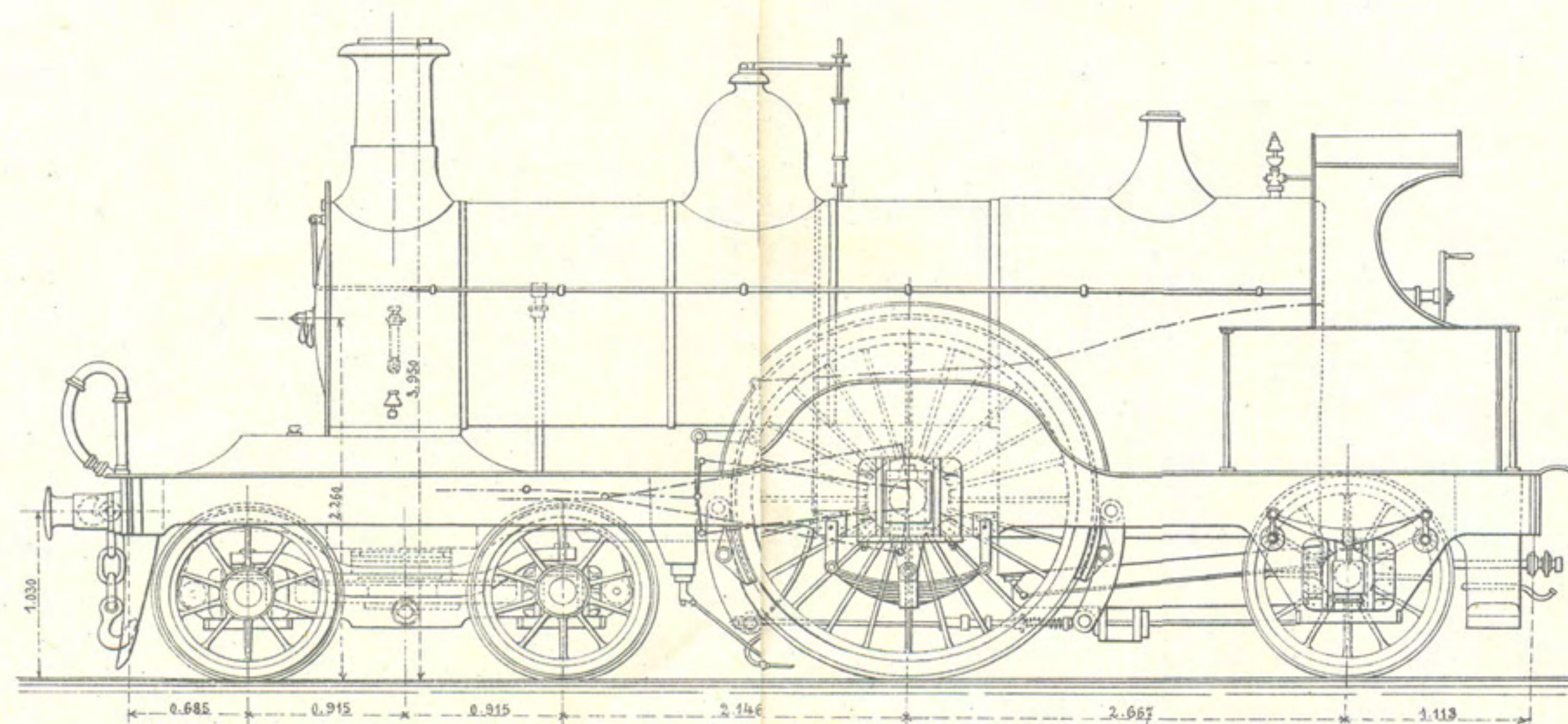
N°3. Etat-Belge. 1835.



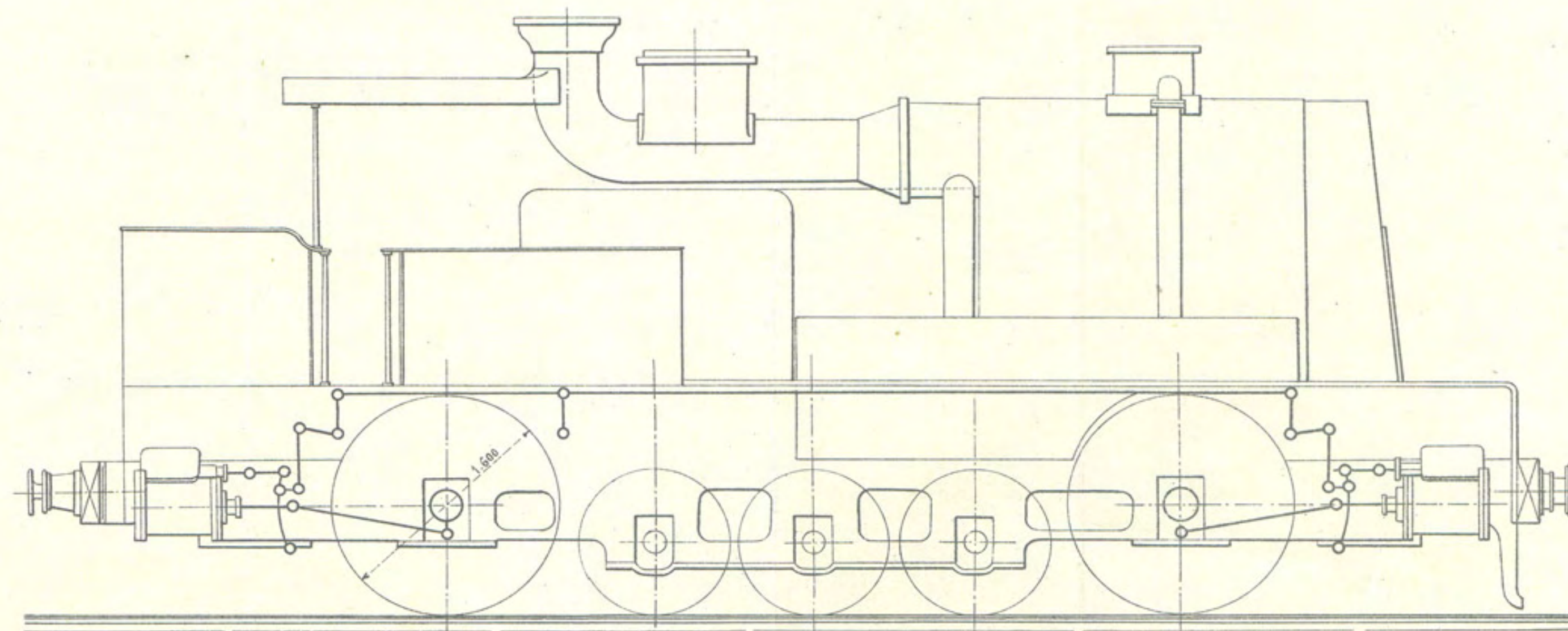
N°4. Locomotive Crampton - Nord-français.



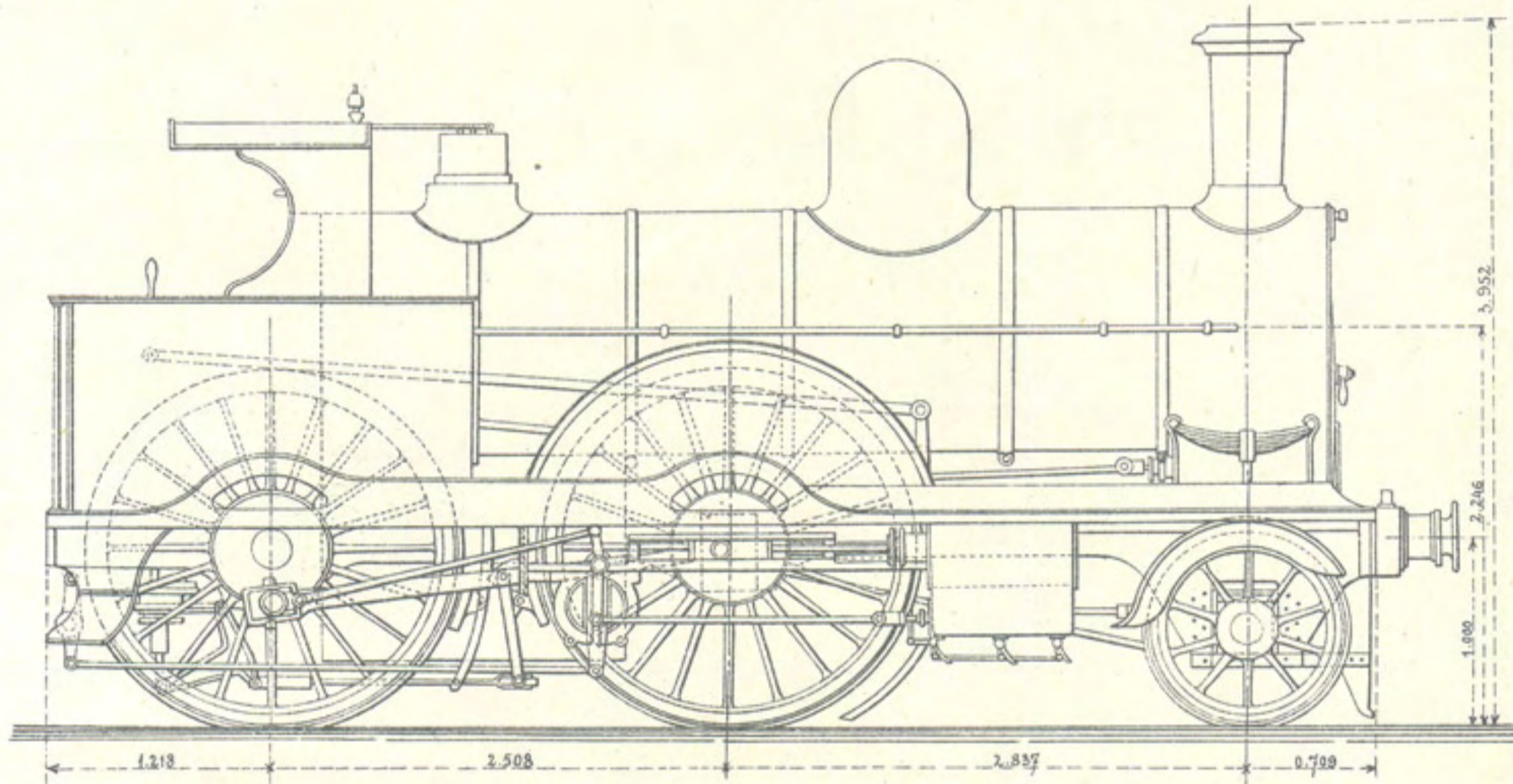
N°5. Midland Railway. (Paris. 1889)



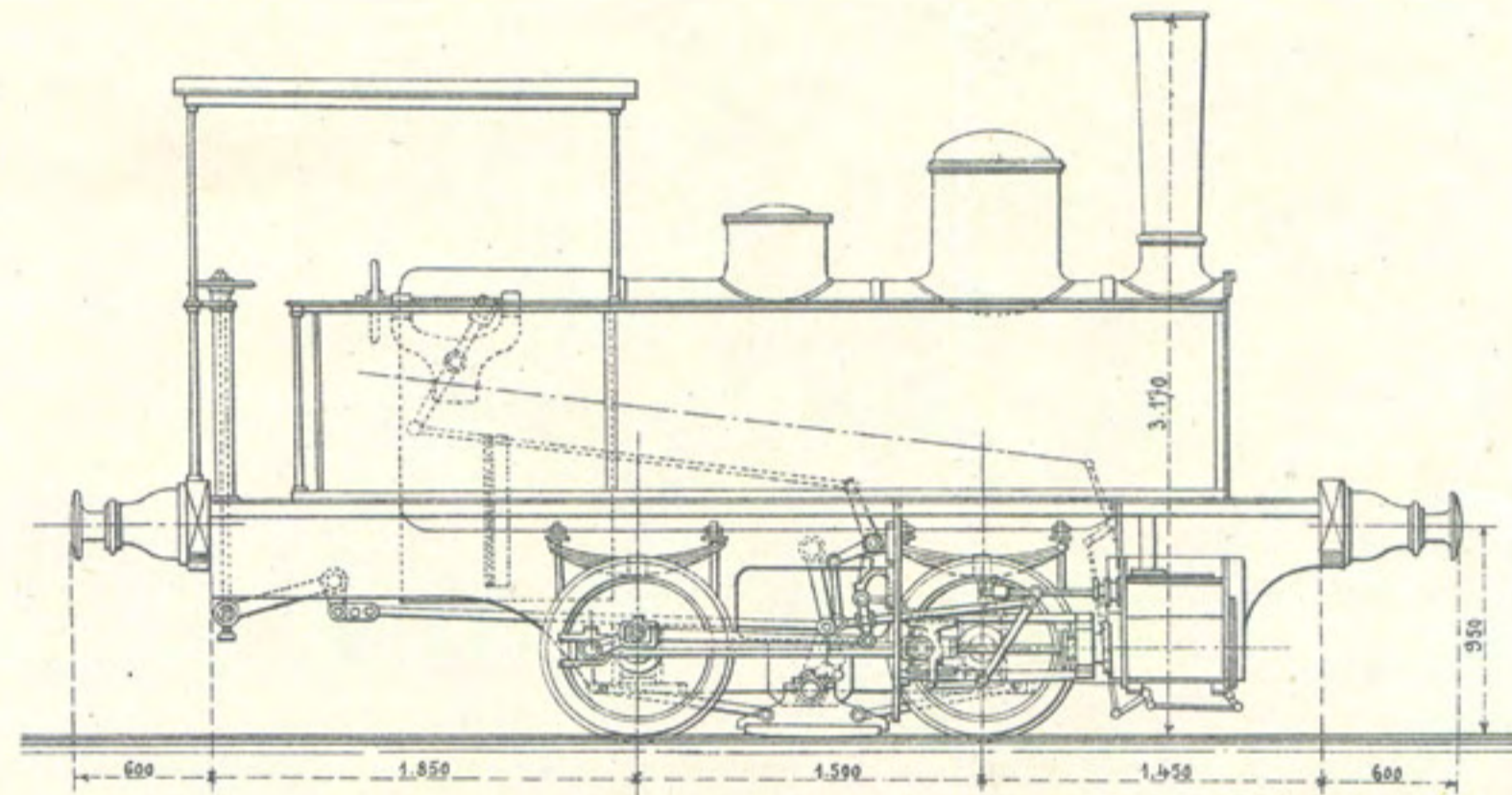
N°6. Nord-français - Locomotive Petiet à voyageurs.



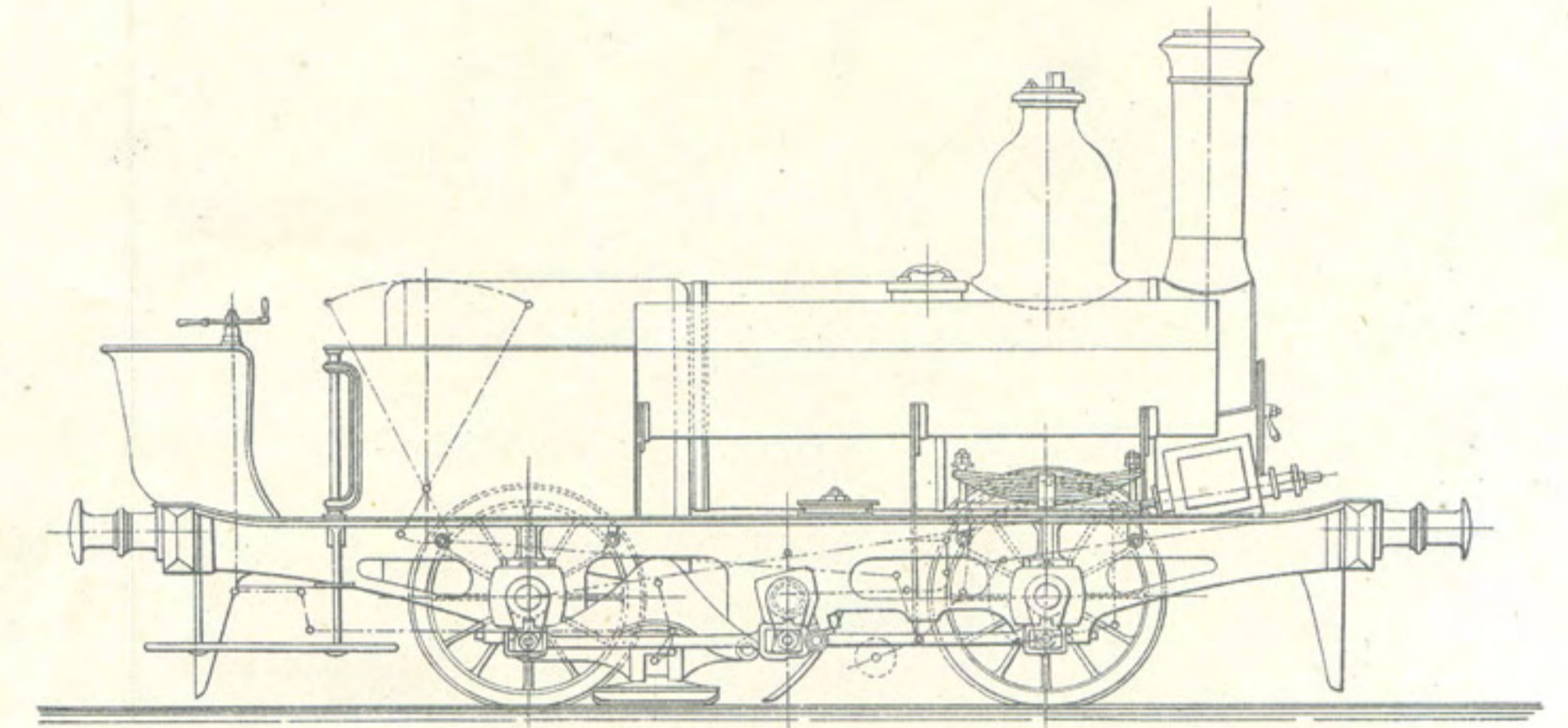
N°7. London et North -Western - Locomotive Compound de Webb.



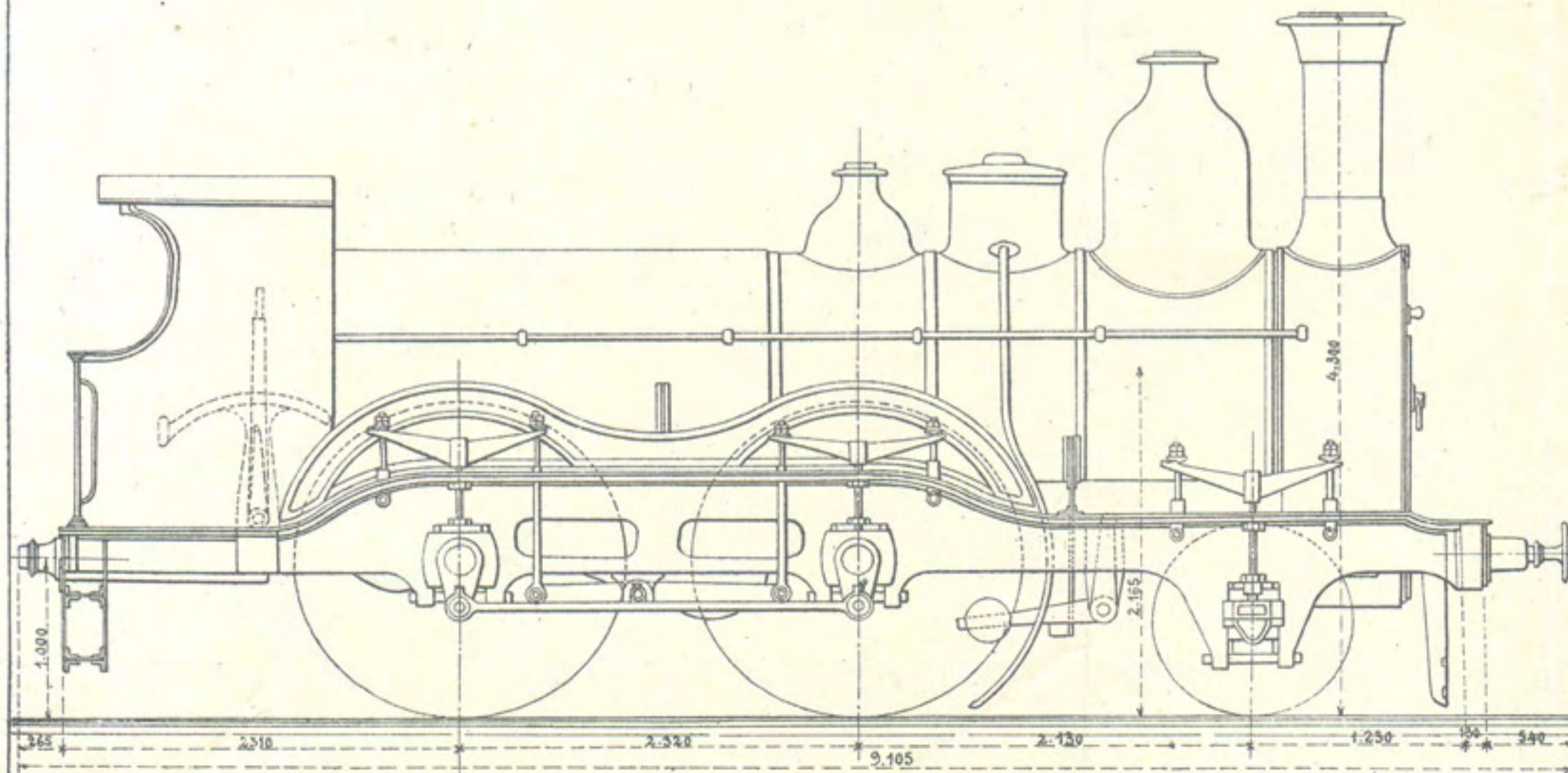
N°8. Locomotive Tender d'Usine.



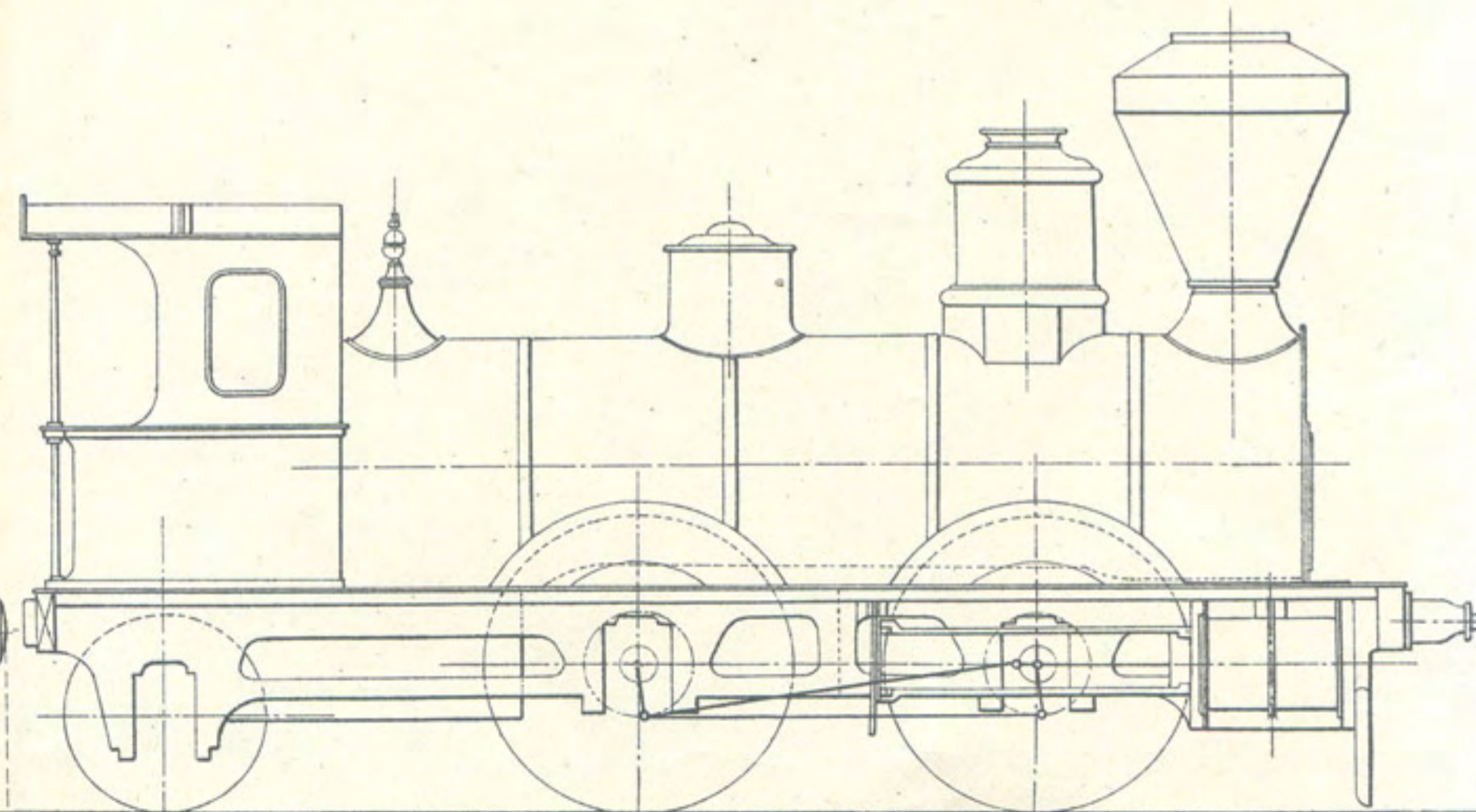
N°9. Locomotive Tender à faux essieux (Usines).



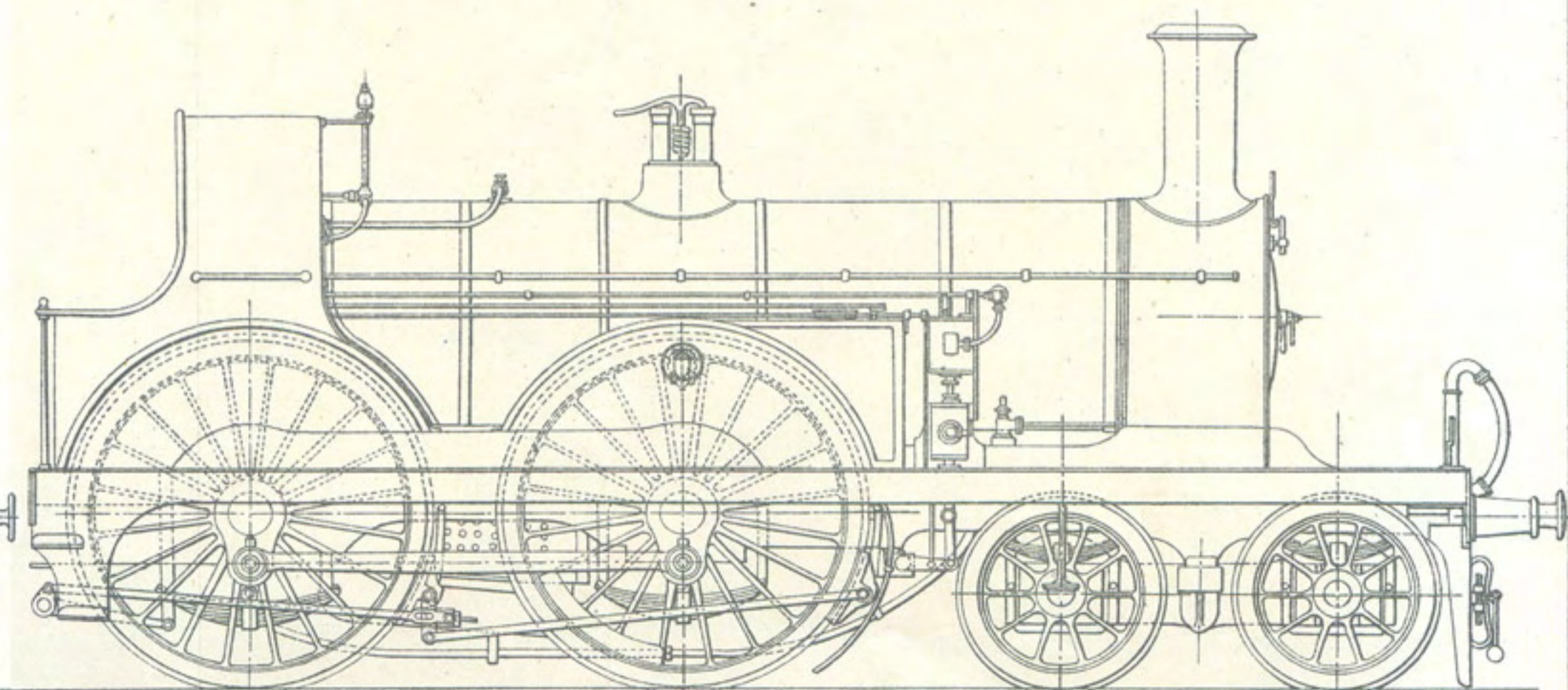
N°10. Etat-Belge - Locomotive mixte à voyageurs.



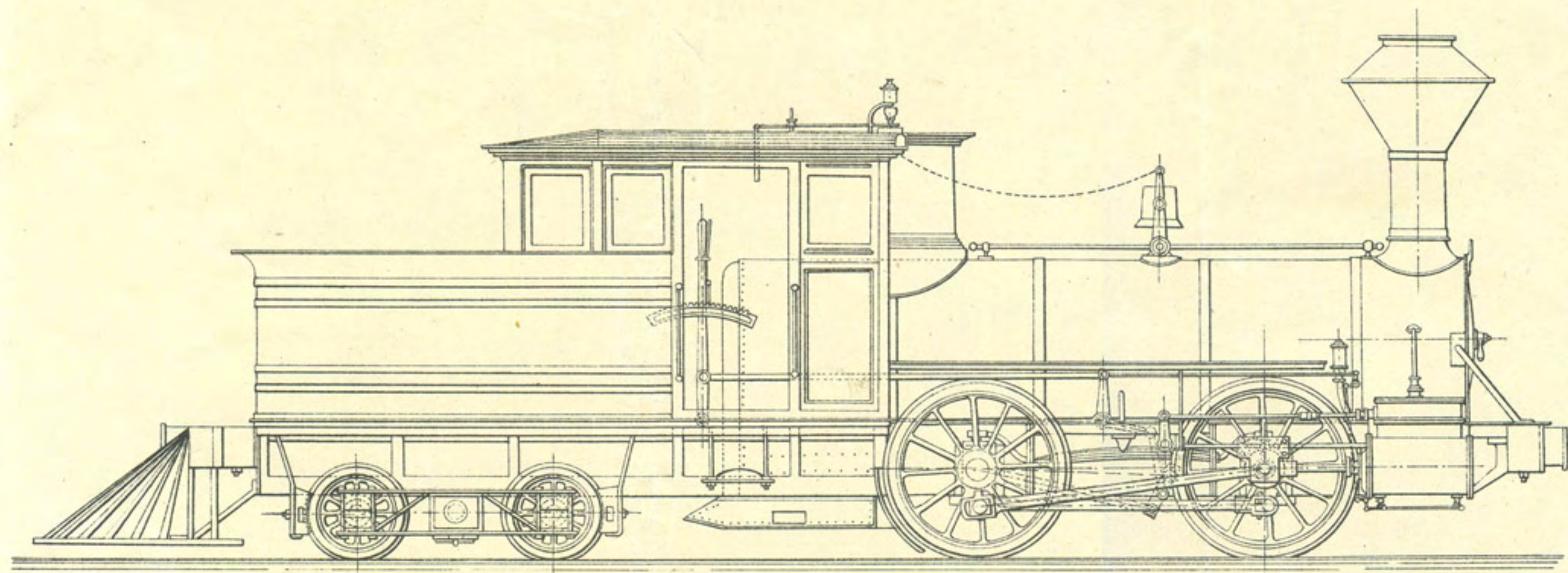
N°11. Orel. Vitebsk - Locomotive mixte à voyageurs.



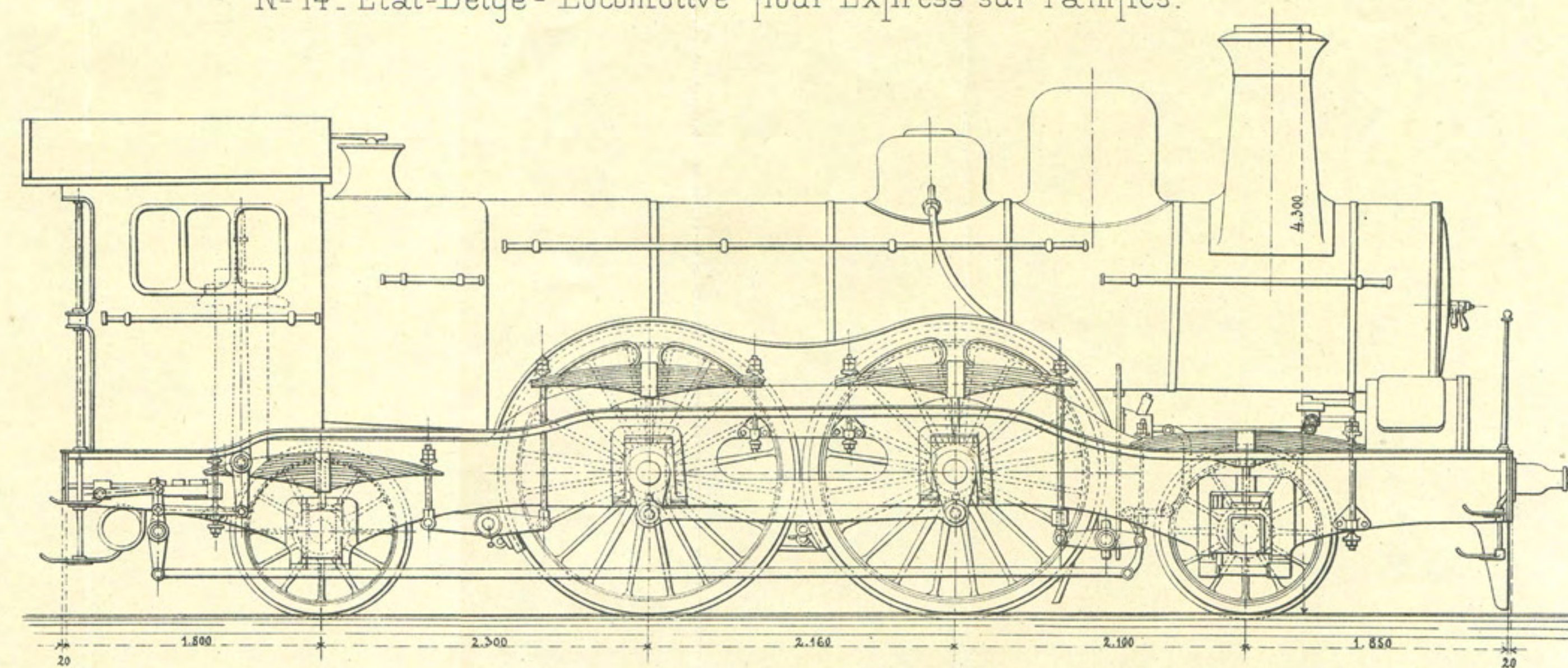
N°12. South Eastern Ry - Locomotive d'Express (Paris 1889).



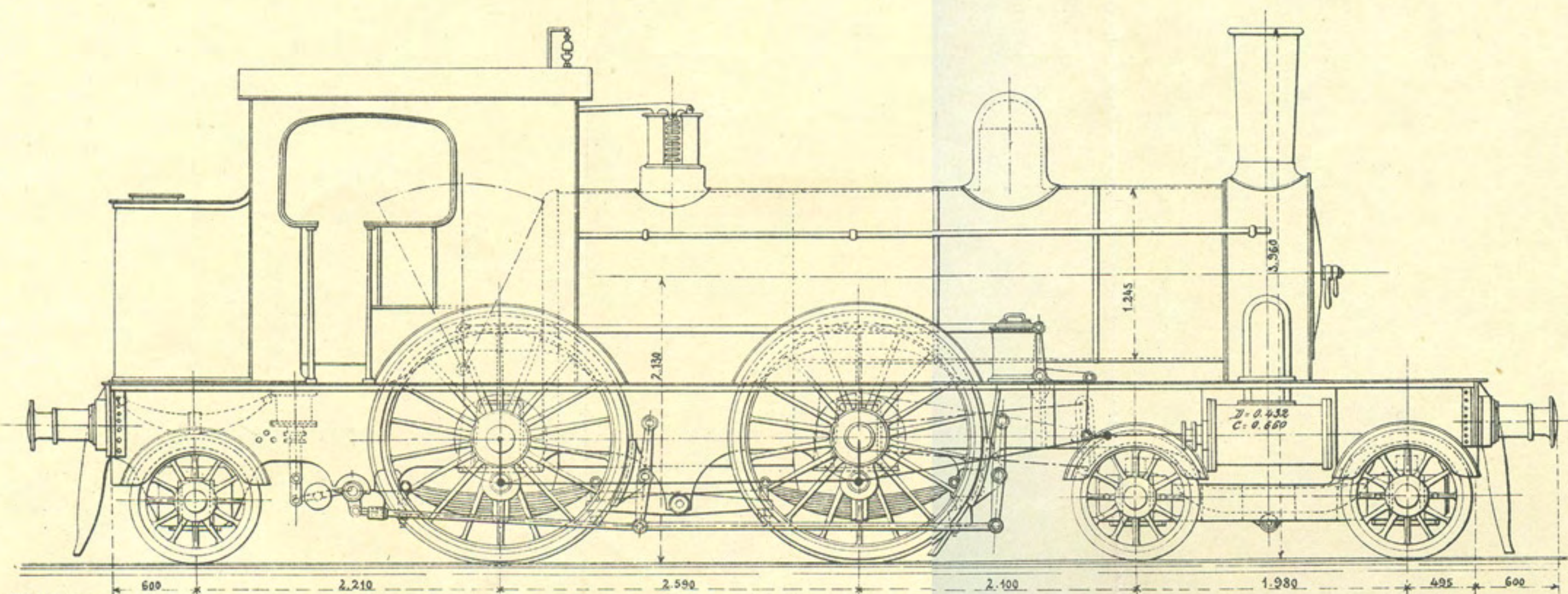
N° 13. Locomotive Tender de Forney — Elevated RR, New-York.



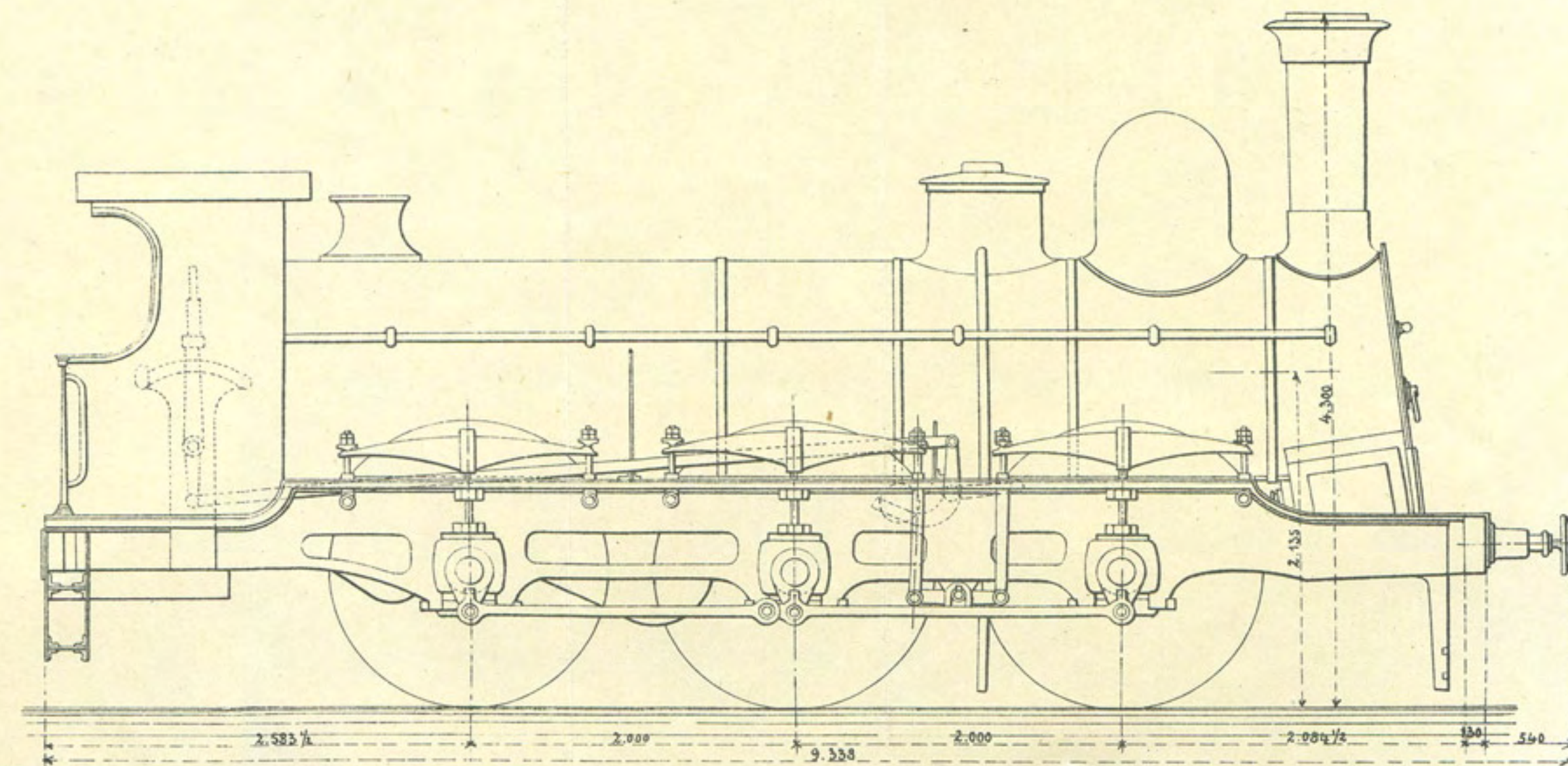
N° 14. Etat-Belge - Locomotive pour Express sur rampes.



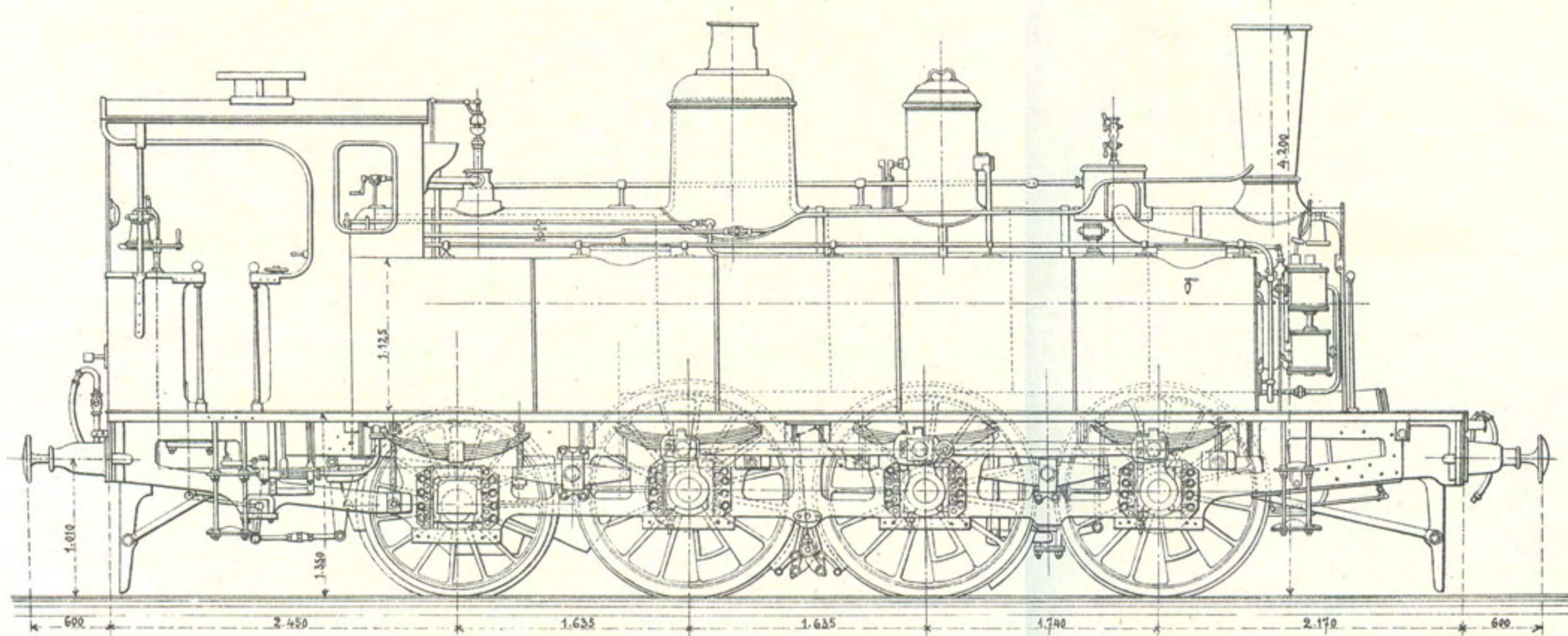
N° 15. London Tilbury et Southend Ry. (1884) Locomotive à voyageurs.



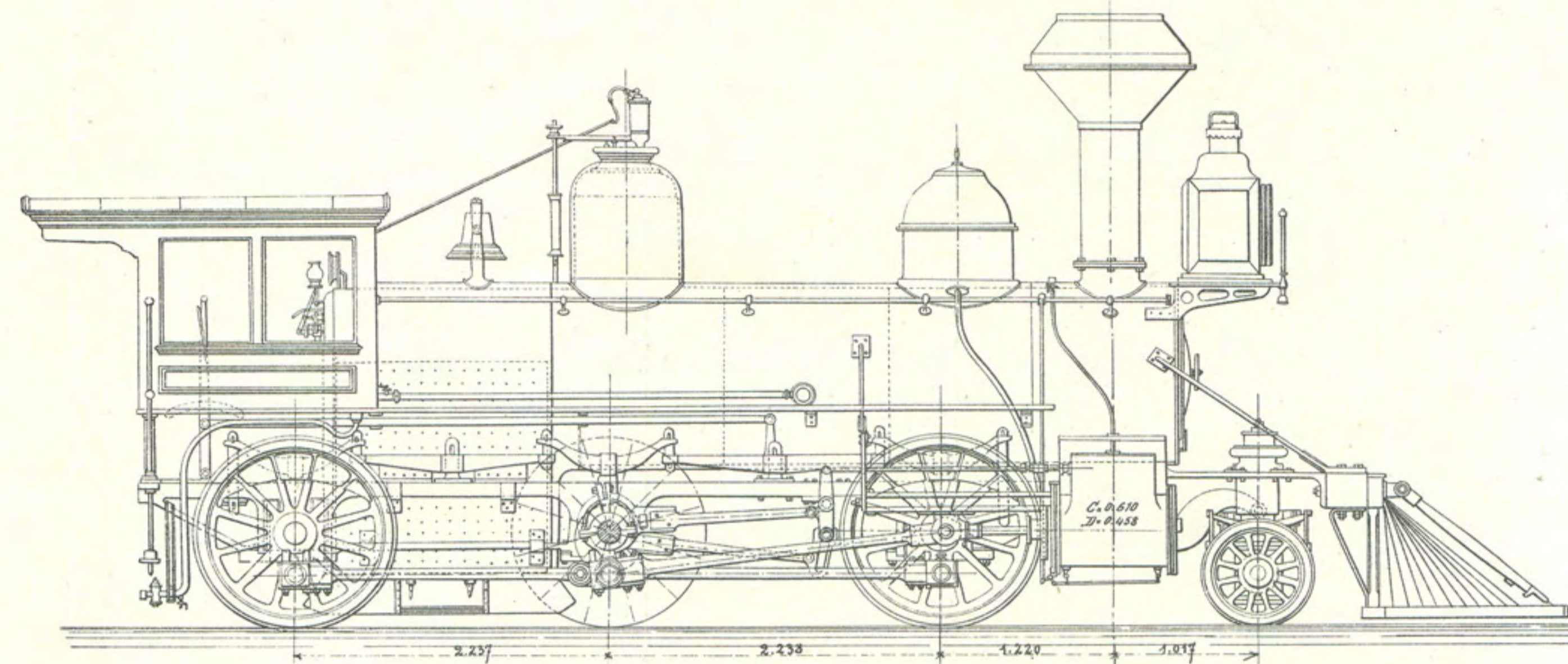
N° 16. Etat-Belge - Locomotive à Marchandises.



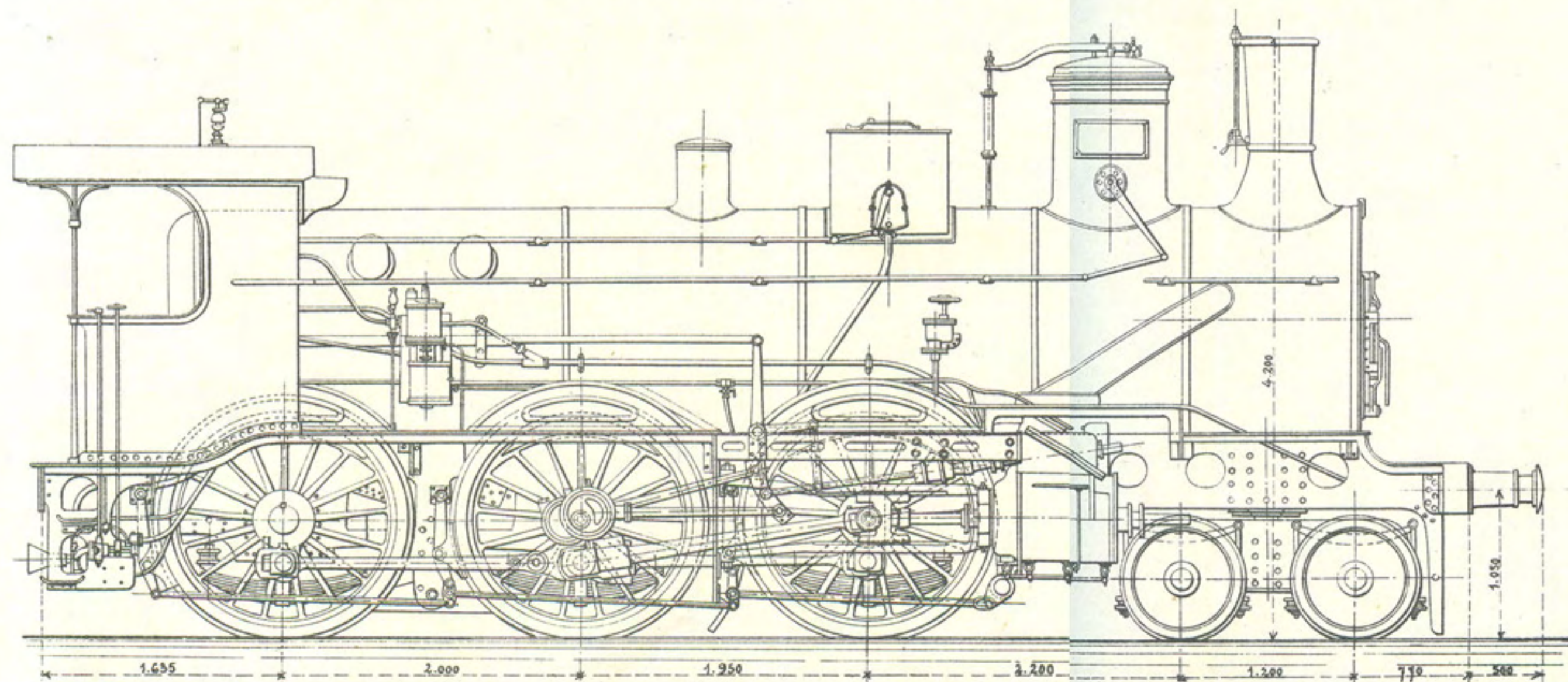
N°17. Est Français - Locomotive Tender pour trains de Banlieue.



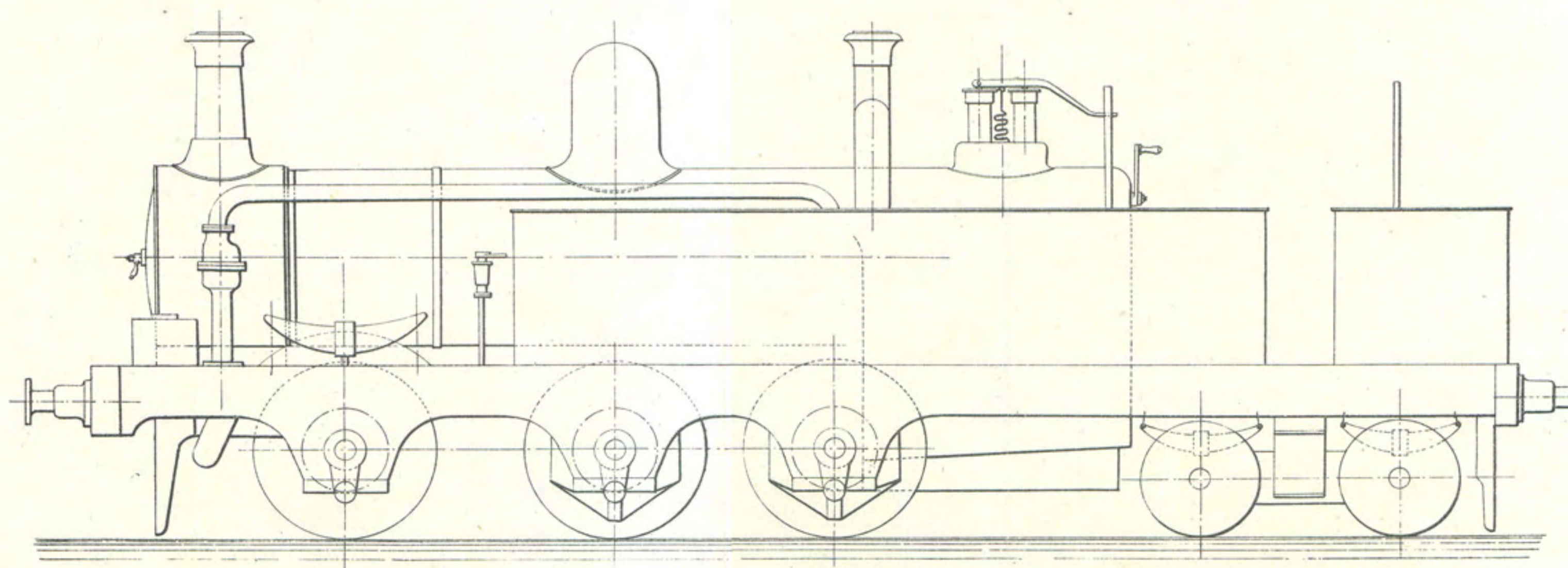
N°18. Louisville - Nashville R.R. Locomotive à marchandises - Type Mogul.



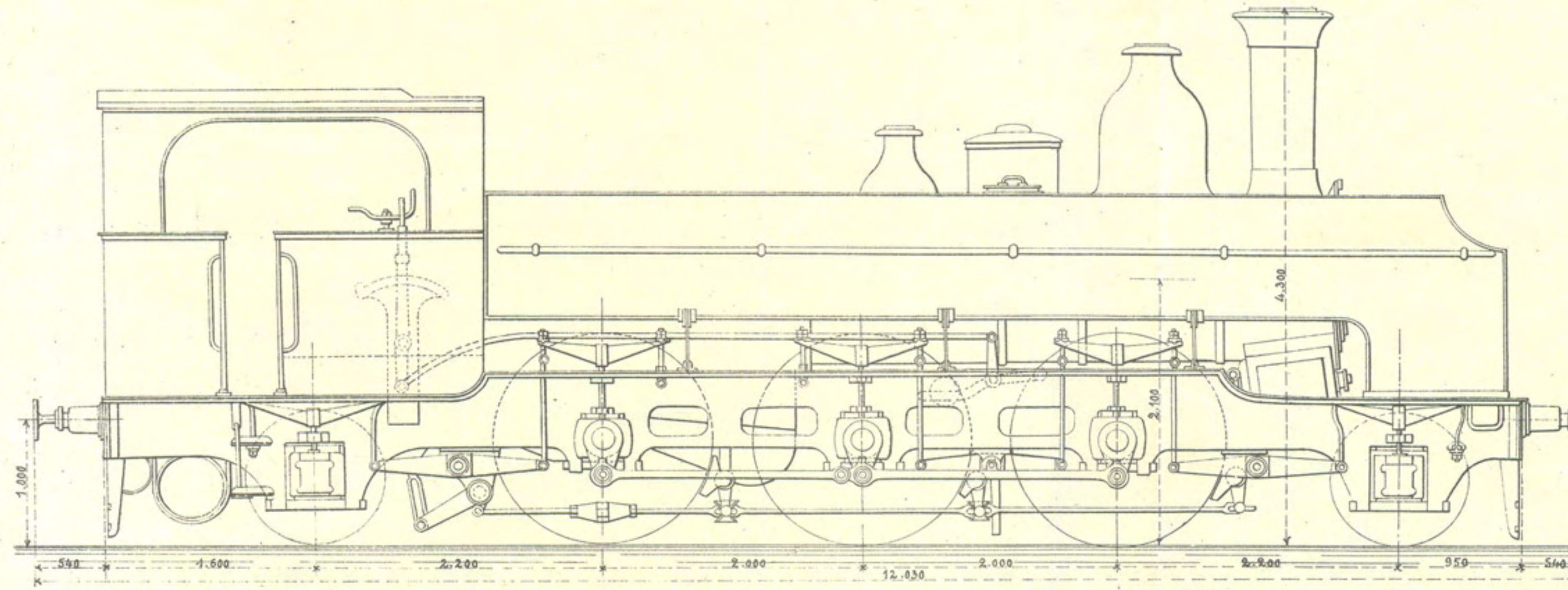
N°19. Italie - Strade Ferrate del Mediterraneo - Locomotive à voyageurs (Paris 1889).



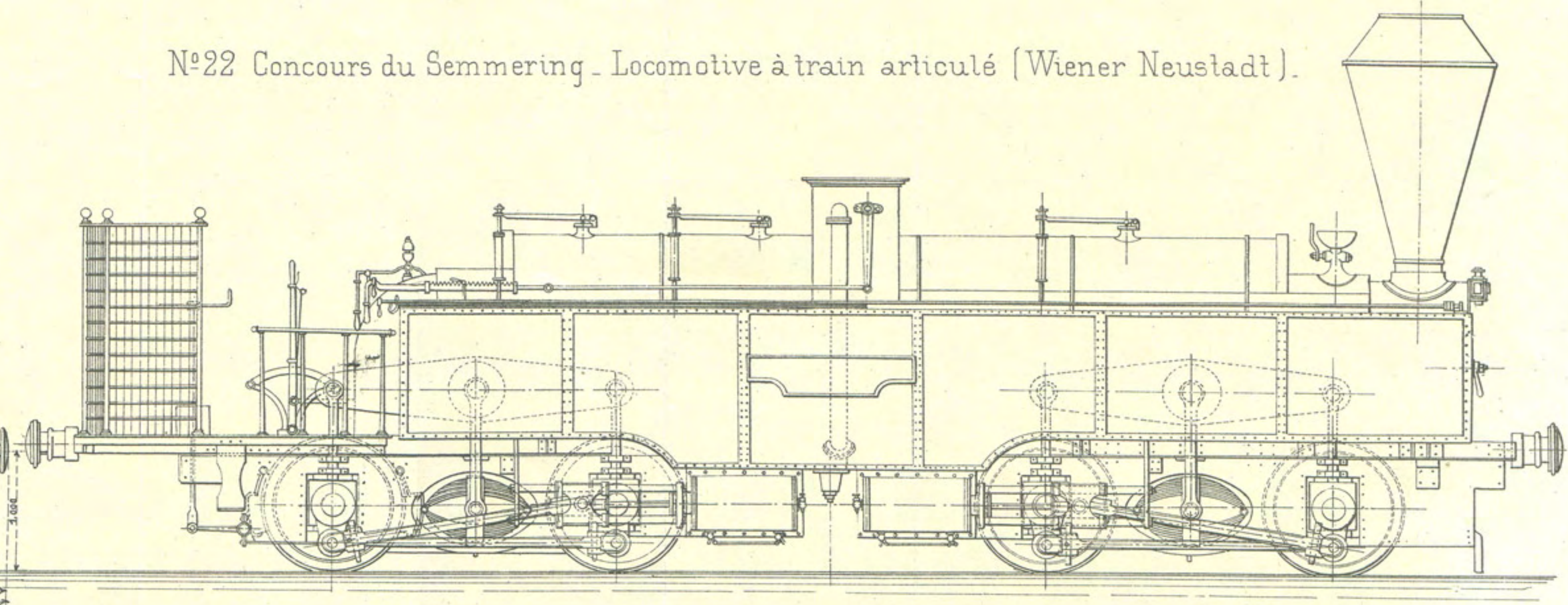
N°20. Locomotive pour le Tunnel sous la Mersey.



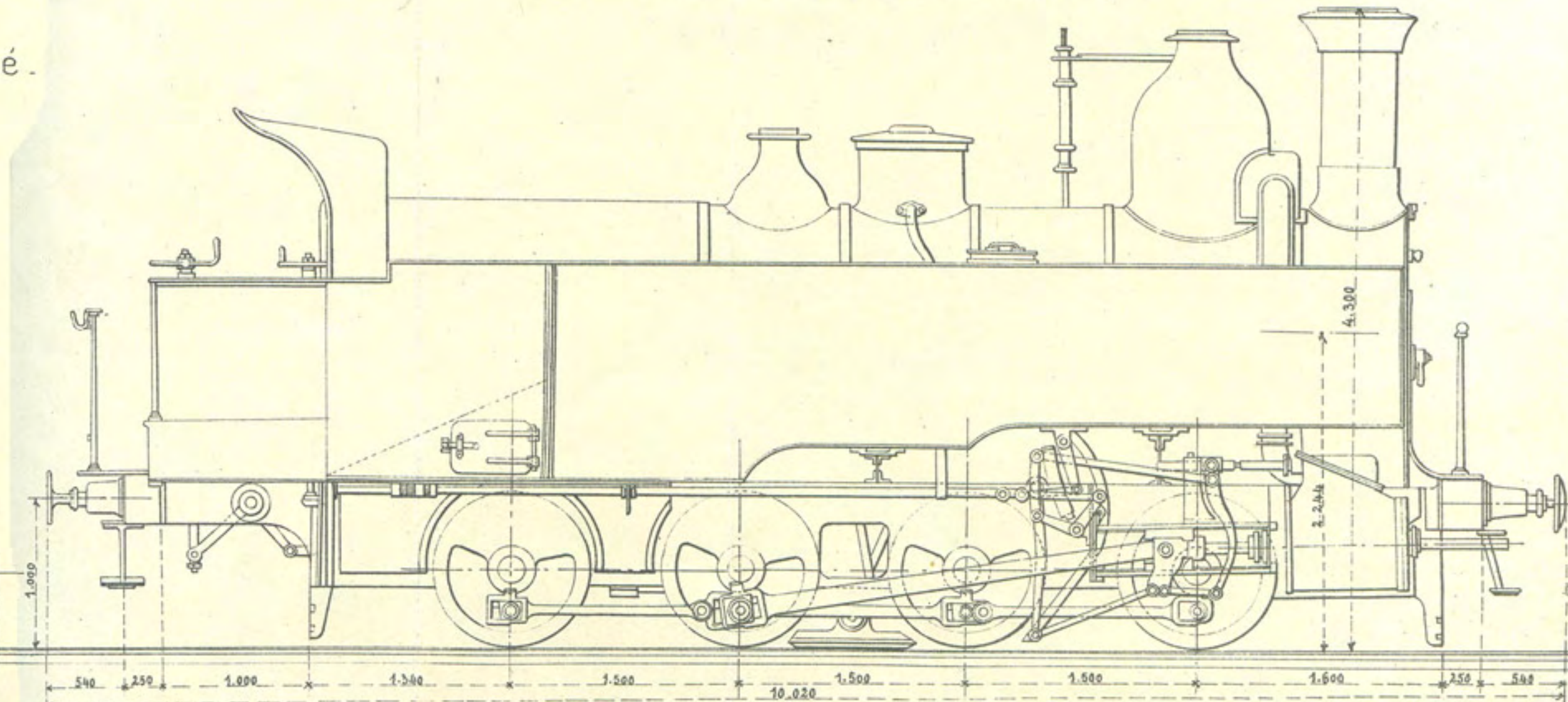
N° 21. Etat Belge. Locomotive tender à voyageurs pour fortes rampes.



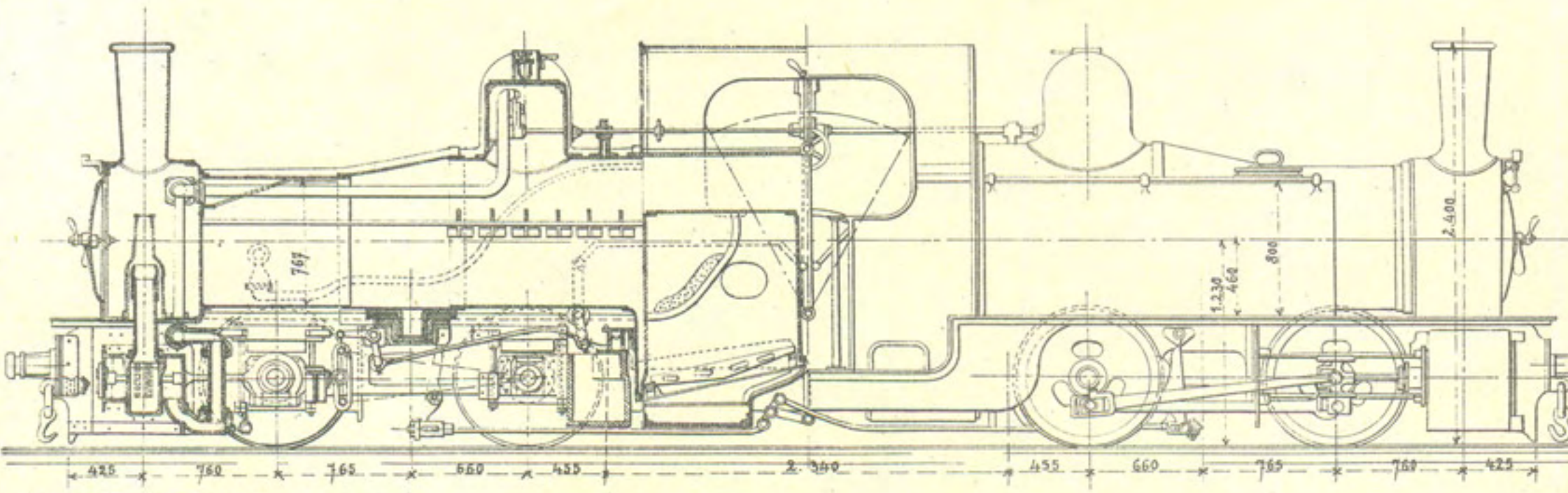
N° 22 Concours du Semmering. Locomotive à train articulé (Wiener Neustadt).



N° 25. Etat Belge. Locomotive d'allège des plans inclinés de Liège.



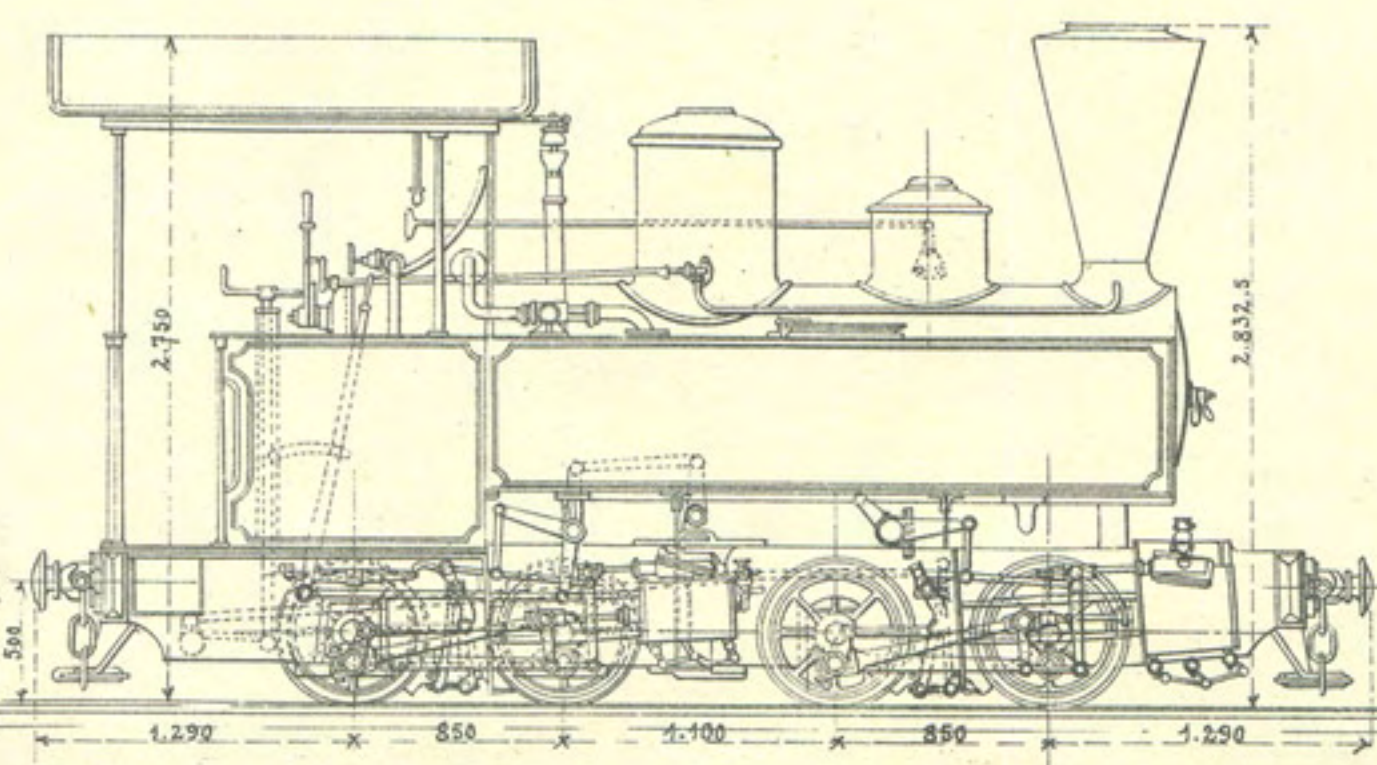
N° 23. Festiniog - Port Madoc.



Locomotive Fairlie à double bogie (Voie de 0.60).

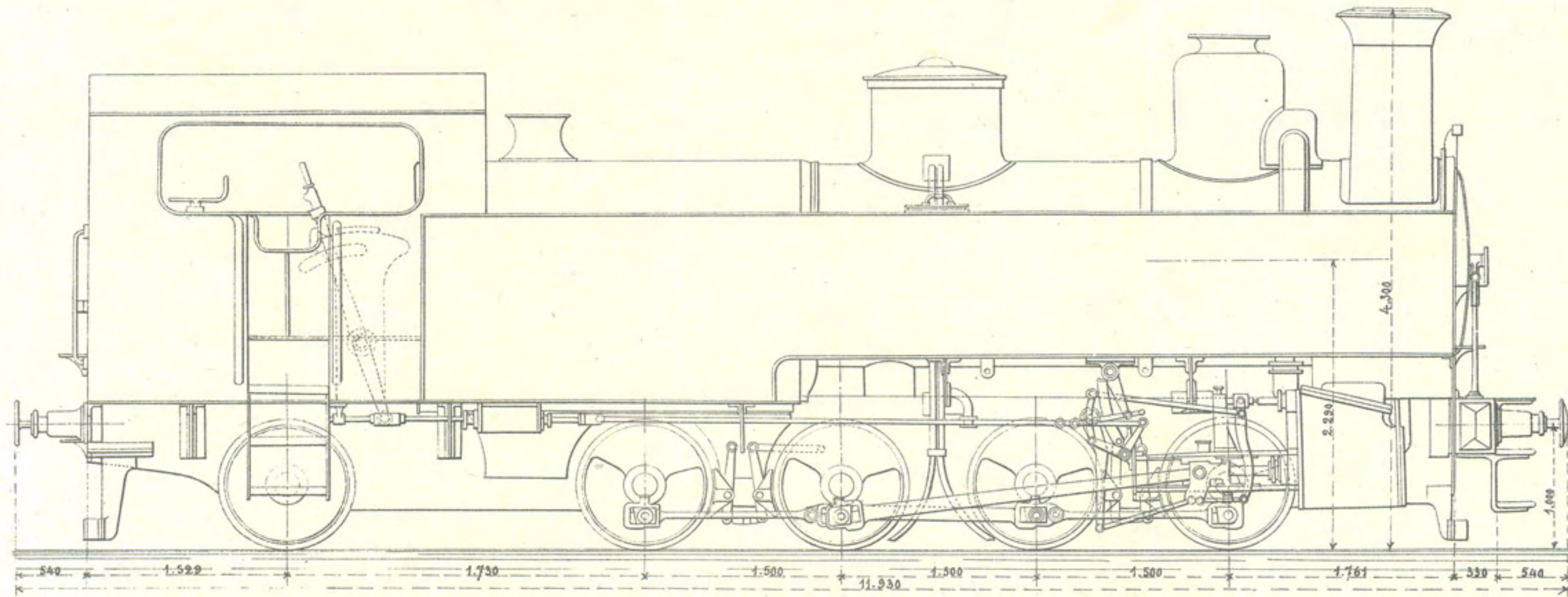
N° 24. Exp. de Paris 1889. Decauville.

Locomotive Compound Mallet à train articulé.

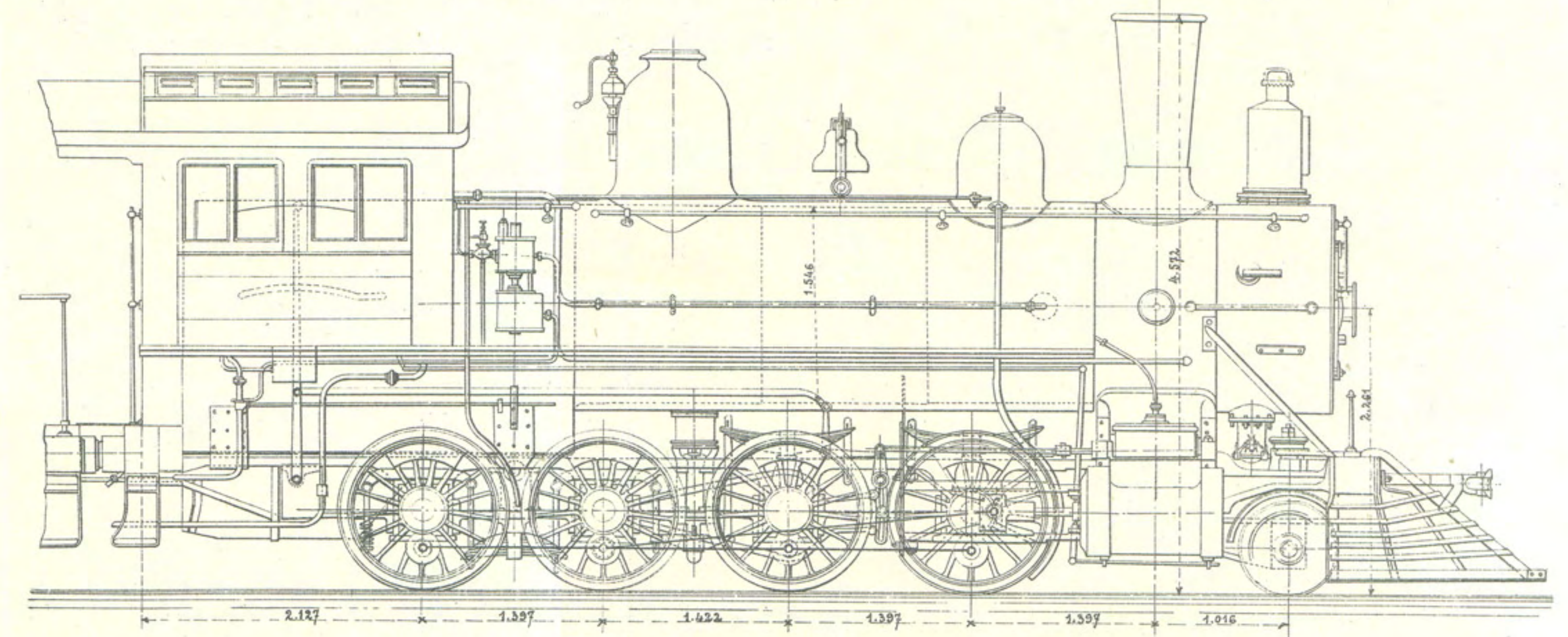


(Distribution A. Stévant).

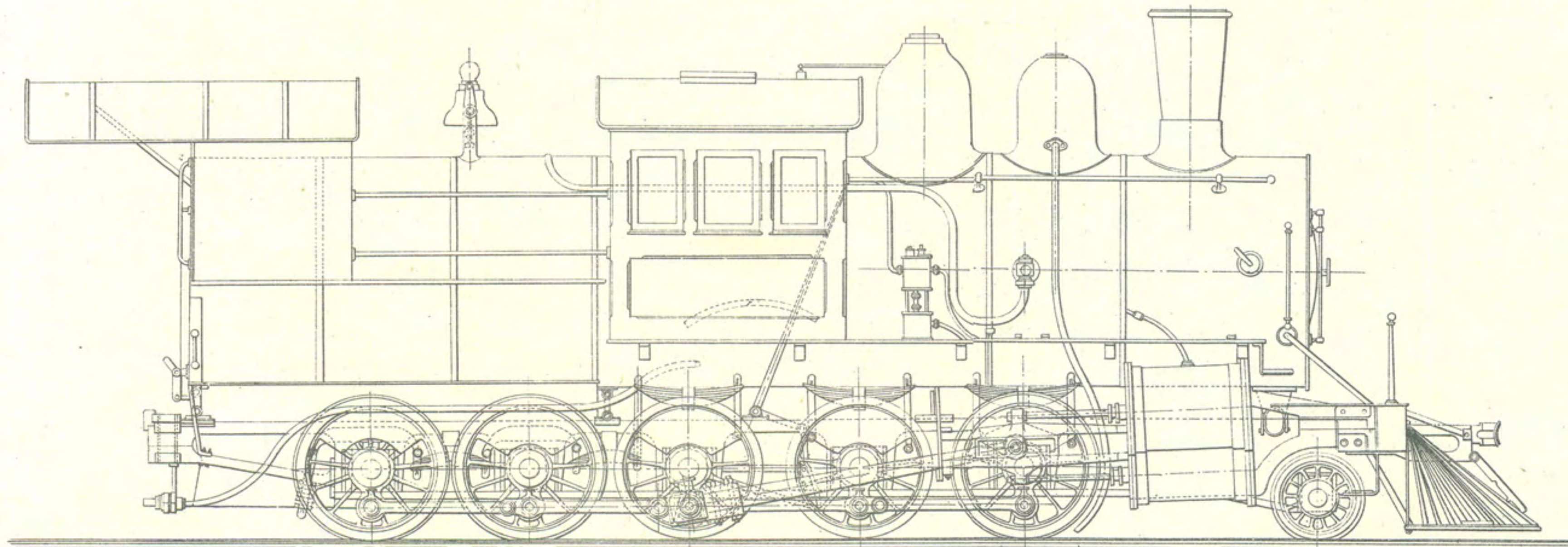
N°26. La Cinquantenaire - Etat-Belge - Modification du N°25.



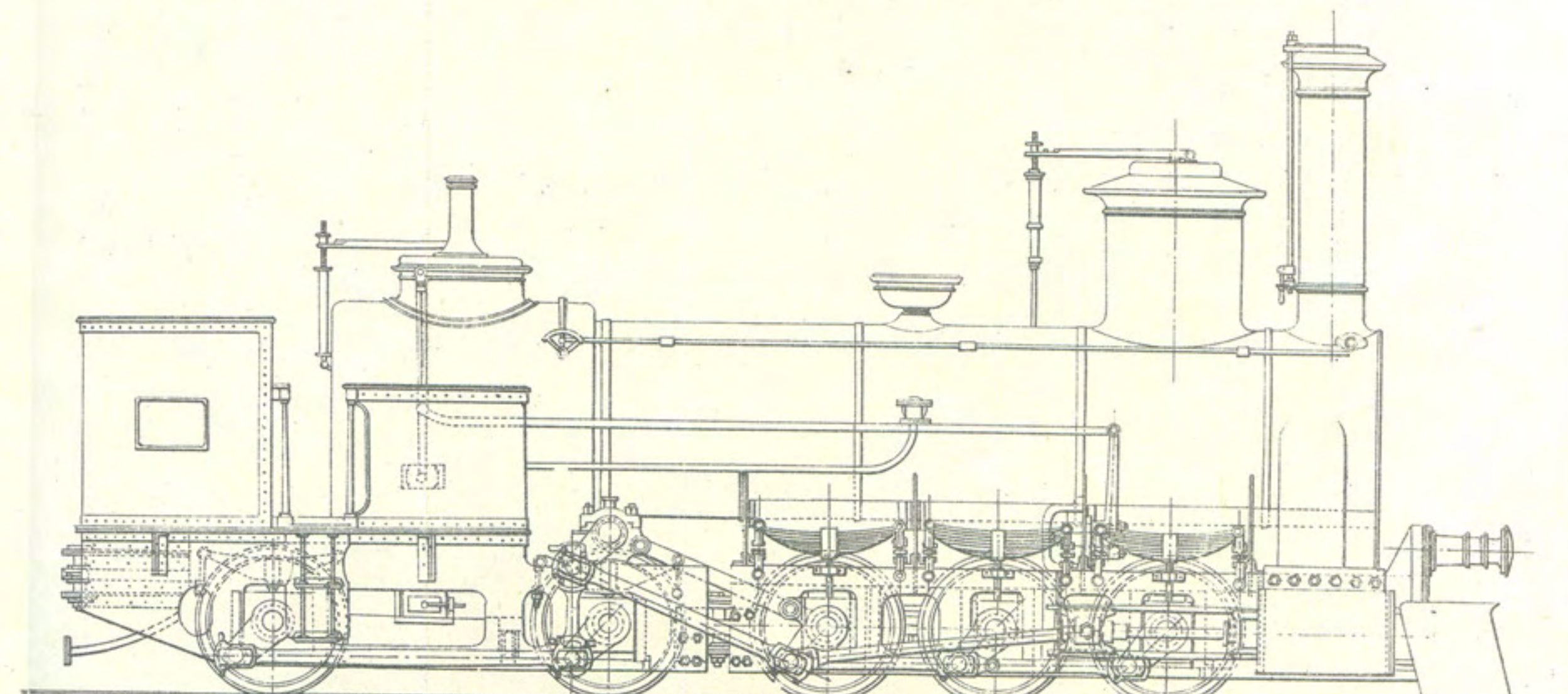
N°27. Pennsylvania Railroad - Type consolidation (Altona 1891).



N°28. "Decapod" Locomotive à marchandises (Baldwin) Compound - Exp. de Chicago 1893.

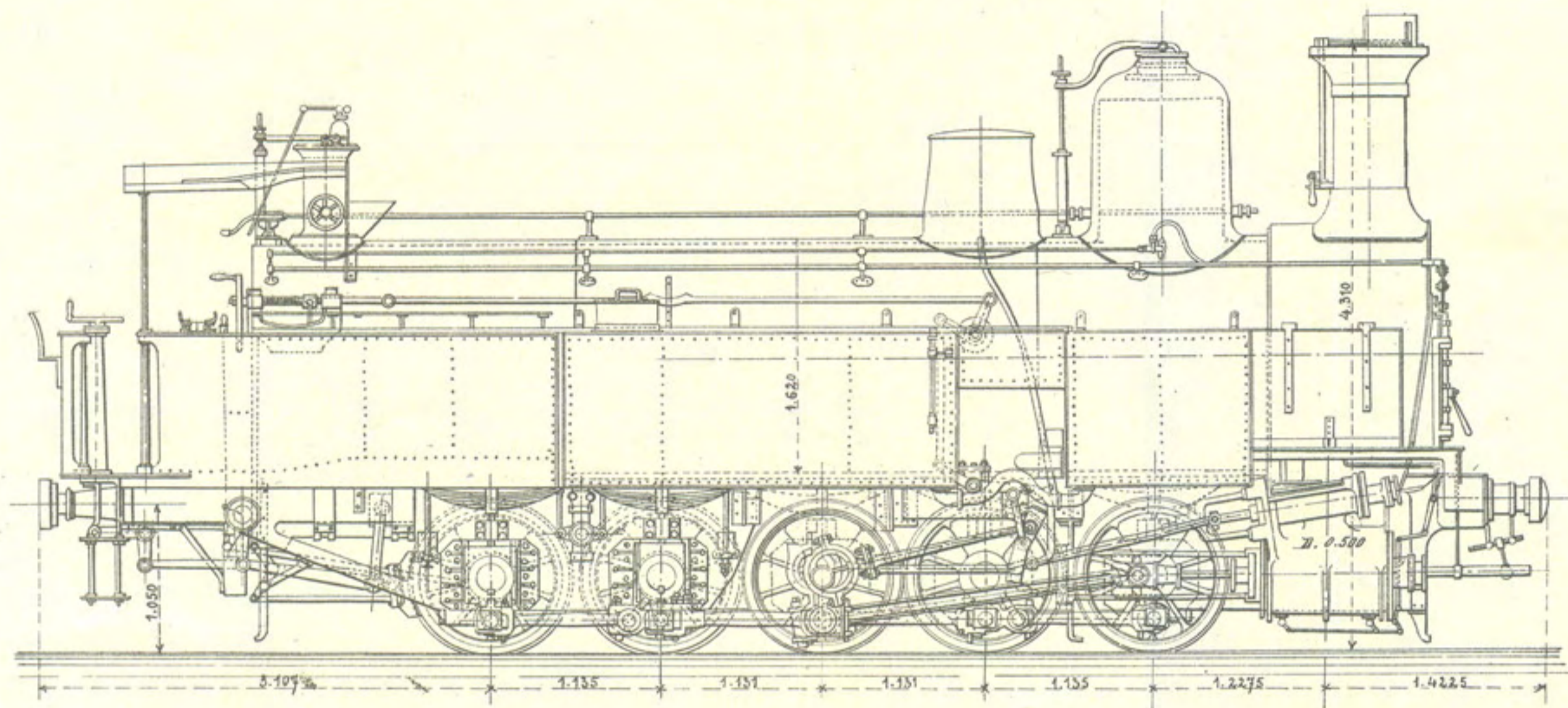


N°29. Etat Autrichien - Locomotive Steyerdorf (Exp. de Paris 1867).

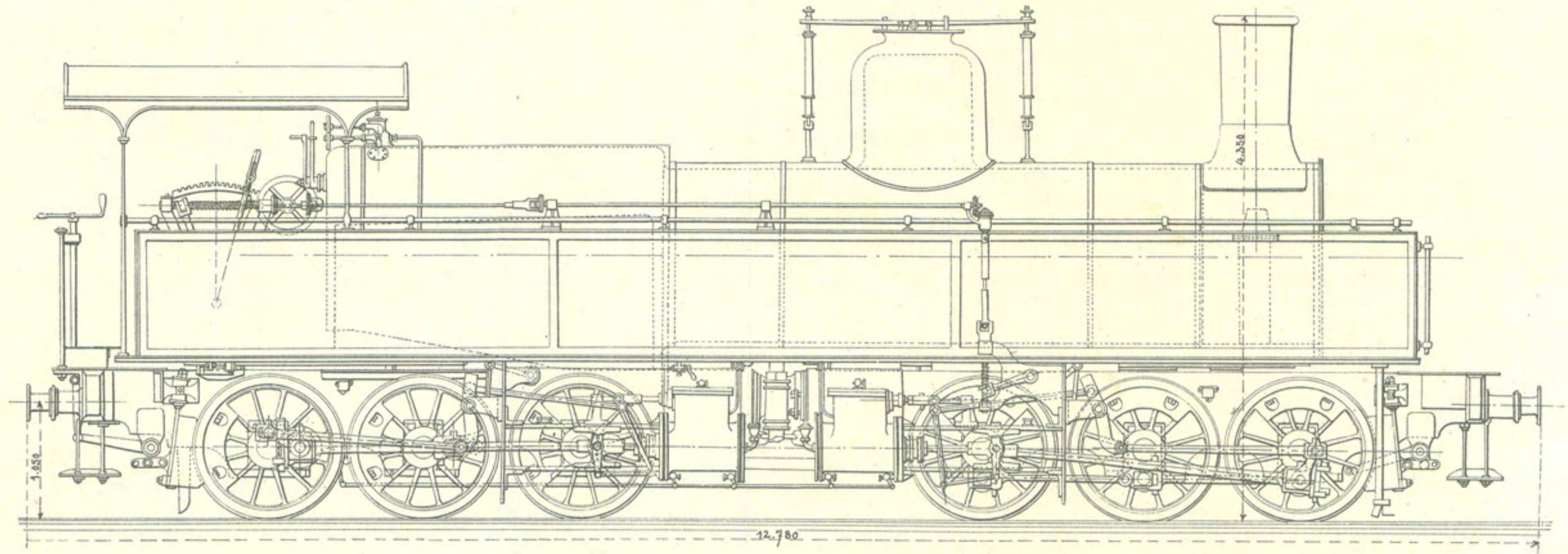




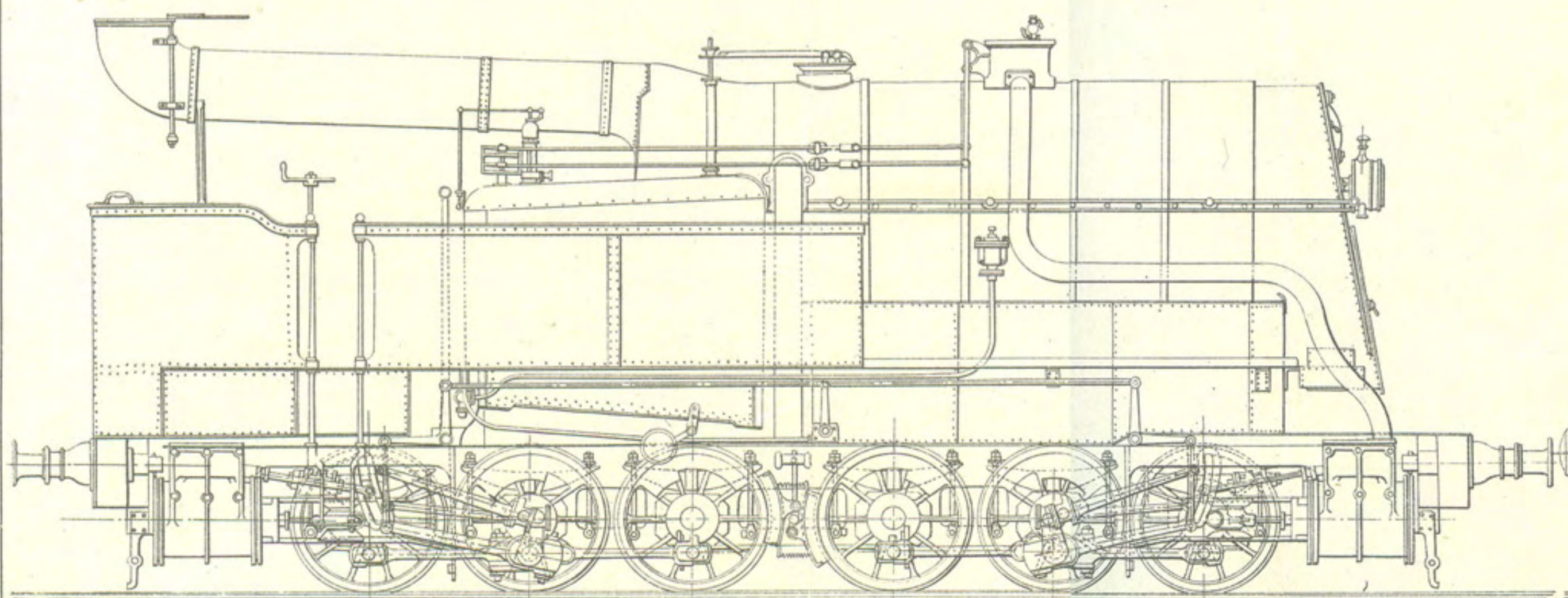
N° 30. Paris-Orléans - Locomotive "Le Cantal".



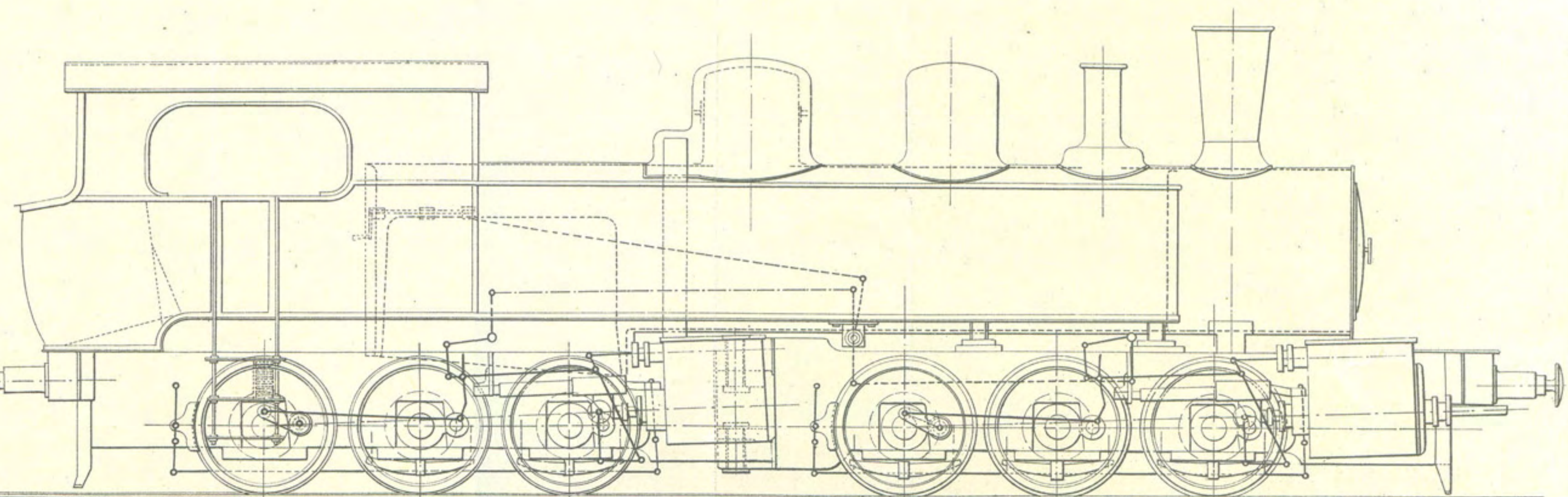
N° 31. Locomotive type Meyer du Grand Central Belge (Vienne 1873).



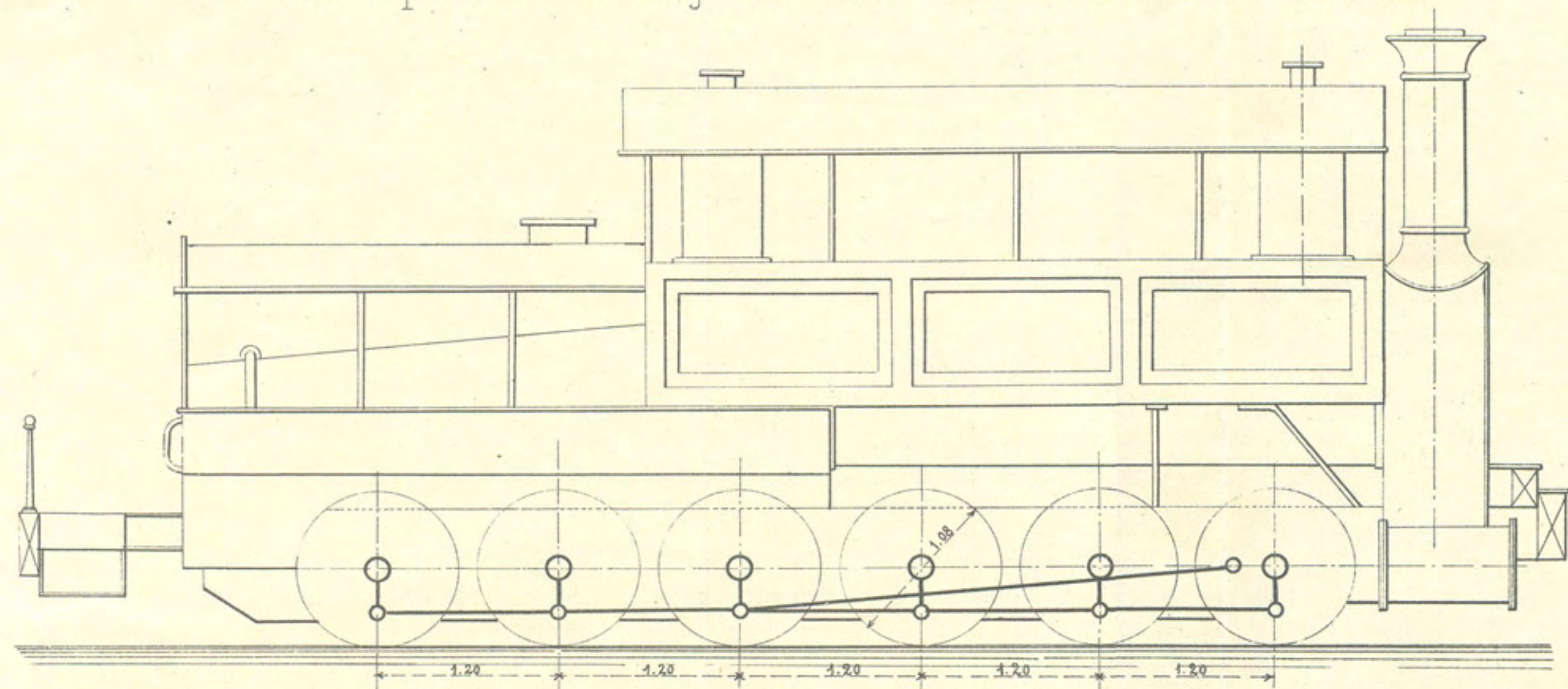
N° 32. Locomotive Petiet - Chemin de fer du Nord-français.



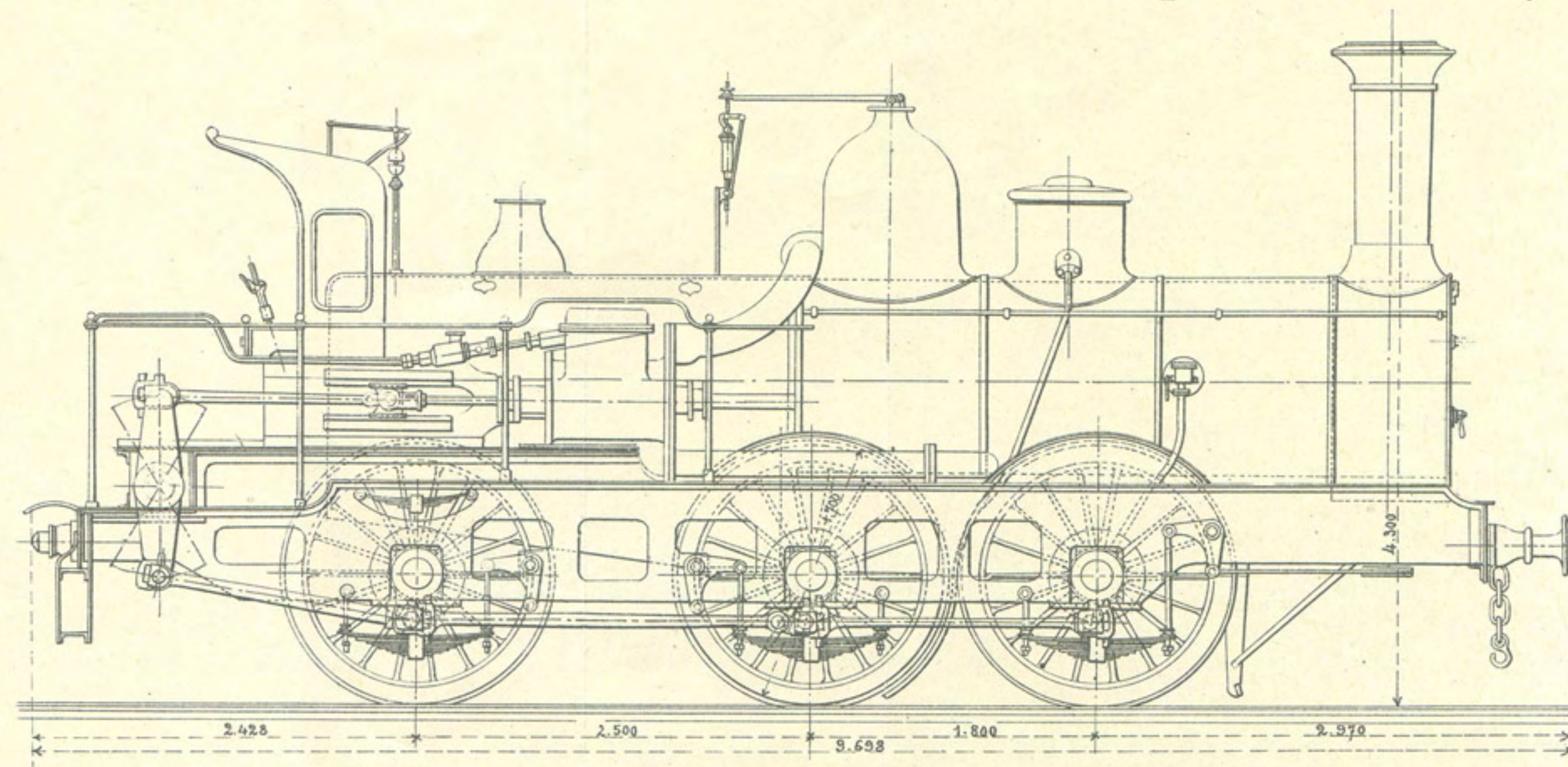
N° 33. Locomotive Compound - Type Mallet - Chemin de fer du Gotthardt.



N° 34. Philadelphia & Reading Railroad - Locomotive Millholland.



N° 35. Etat-Belge. Locomotive Belpaire - Stévaré (Vienne 1873) pour trains de voyageurs.



N° 36. Locomotive électrique de Heilmann - Ouest-Français. (1894)

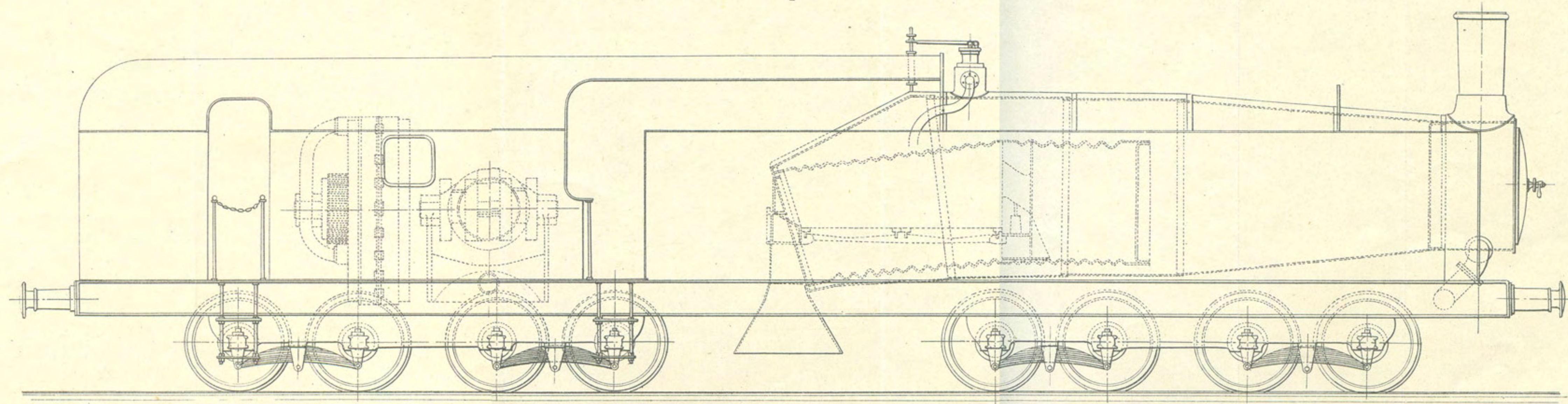


Fig. 1. Résistance au roulement.

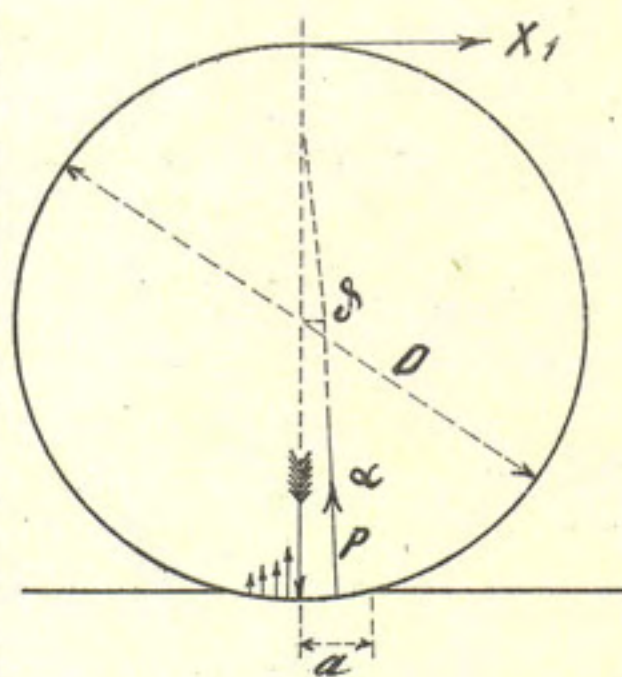


Fig. 3. Frottement des fusées.

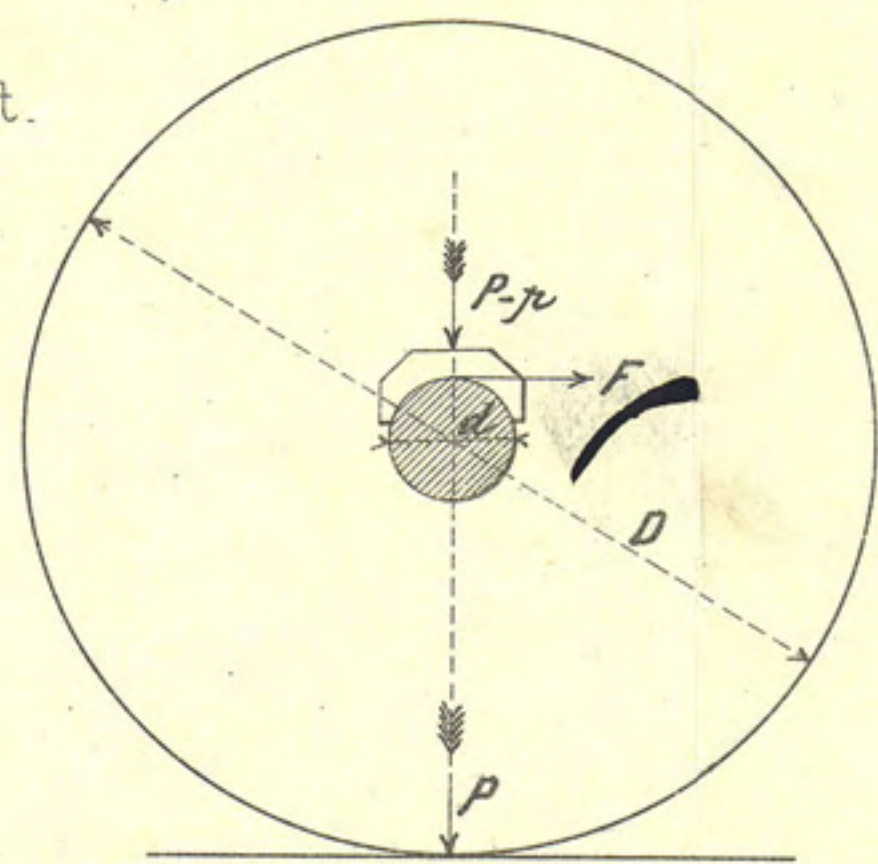


Fig. 2. Frottement dû à la cônicité des bandages.

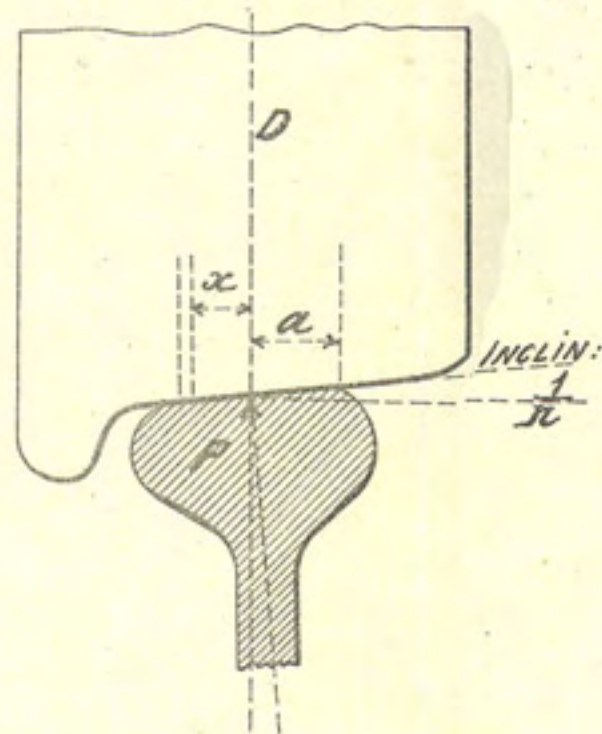


Fig. 5. Résistance due aux rampes.

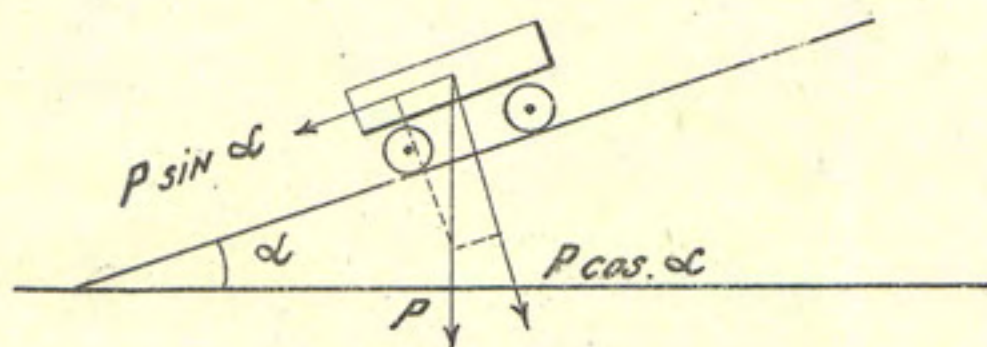


Fig. 6 et 7. Estimation des résistances en courbe.

Fig. 6. Solidarité des roues.

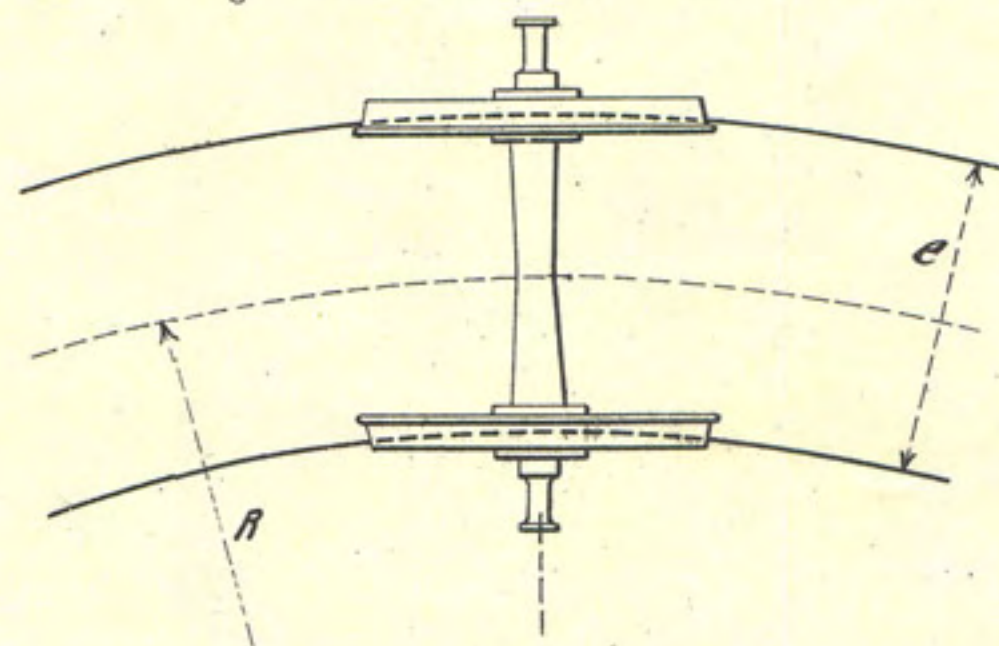


Fig. 7. Parallelisme des essieux.

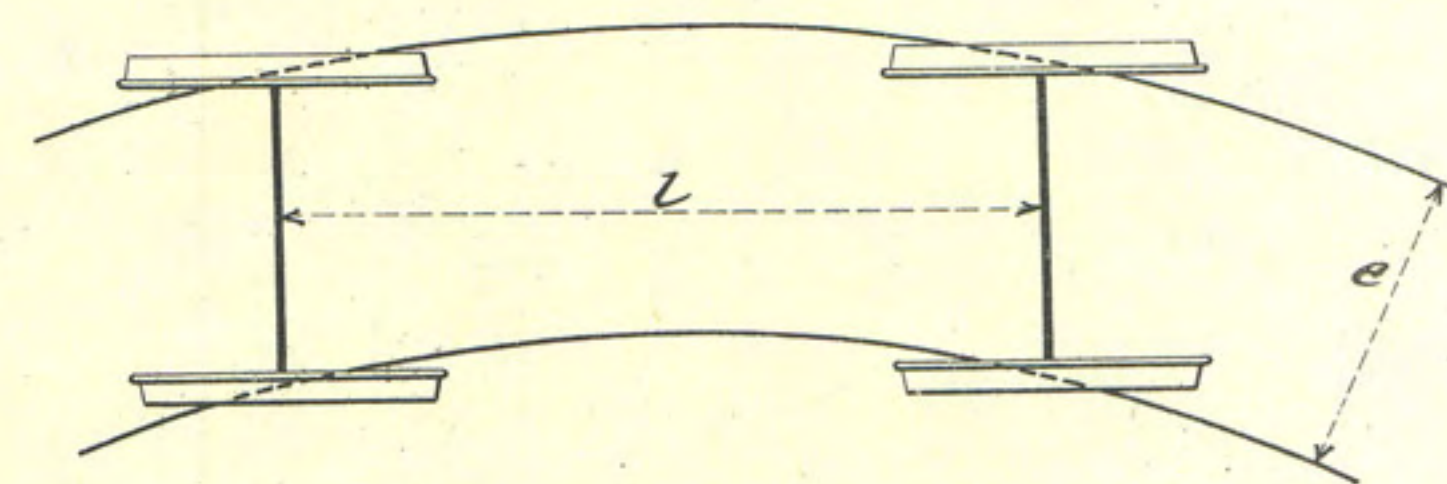


Fig. 8. Longueur virtuelle des rampes.

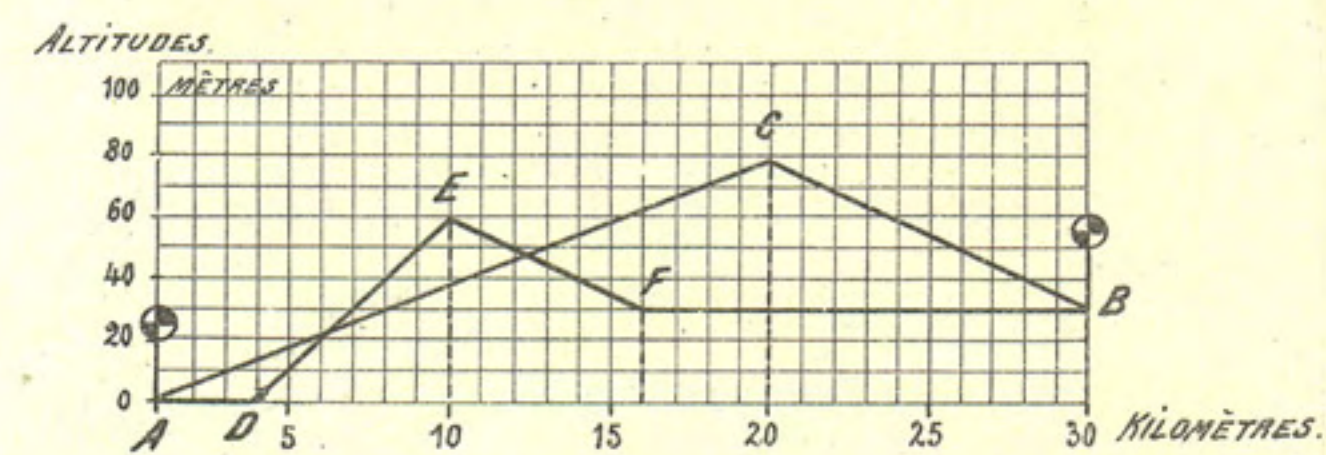


Fig. 9 et 10. Longueur virtuelle d'une ligne donnée.

Fig. 9. PROFIL EN LONG.

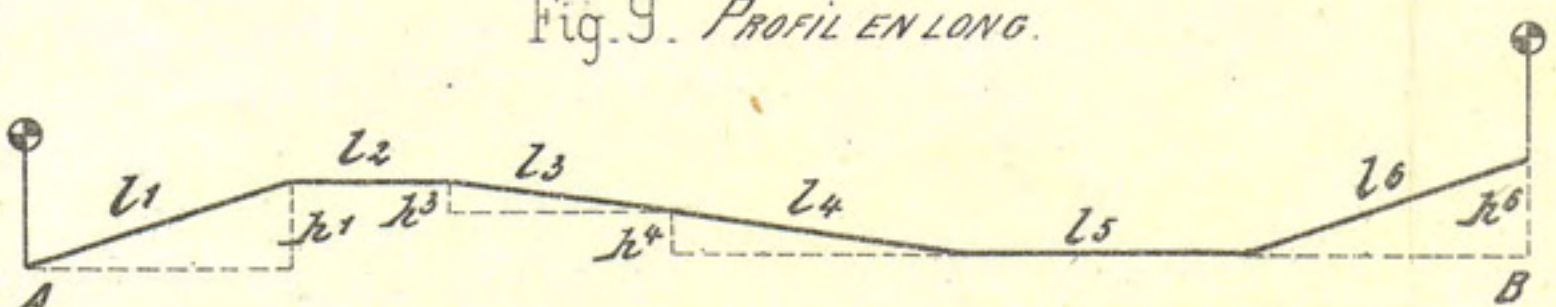
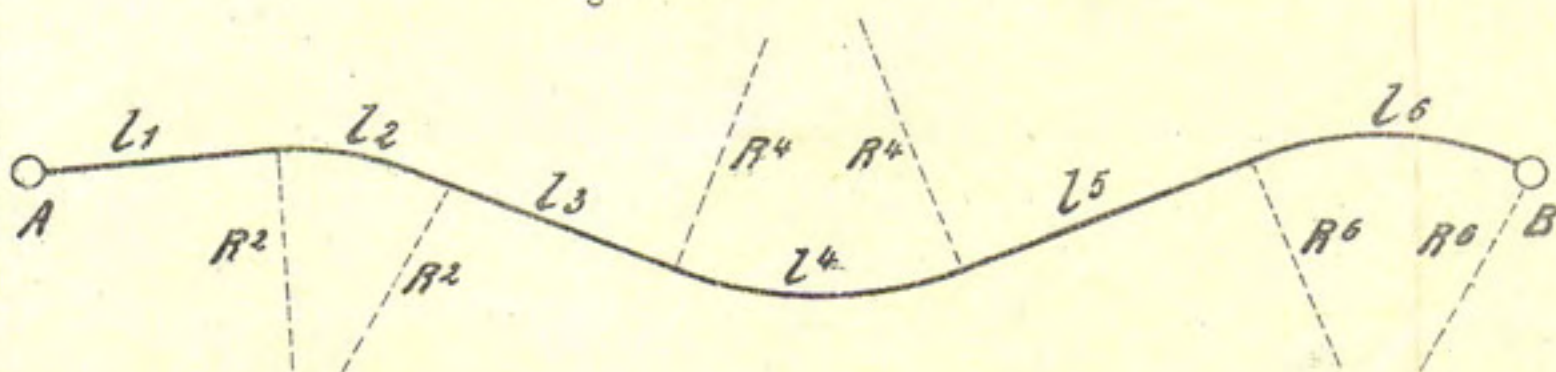


Fig. 10. TRACÉ EN PLAN.



L. HARTY FILS BRUXELLES.

Diagramme de Ivatt.

10.	20.	30.	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	140.	150.
0.333	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
0.250	0.667	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.40
0.220	0.550	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00
0.208	0.500	0.875	1.25	1.625	2.00	2.375	2.75	3.125	3.50	3.875	4.25	4.625	5.00	5.375
0.200	0.468	0.875	1.25	1.625	2.00	2.375	2.75	3.125	3.50	3.875	4.25	4.625	5.00	5.375
0.194	0.444	0.800	1.111	1.333	1.667	2.000	2.333	2.667	3.000	3.333	3.667	4.000	4.333	4.667
0.191	0.444	0.800	1.111	1.333	1.667	2.000	2.333	2.667	3.000	3.333	3.667	4.000	4.333	4.667
0.188	0.429	0.750	1.000	1.250	1.500	1.750	2.000	2.250	2.500	2.750	3.000	3.250	3.500	3.750
0.185	0.416	0.715	0.963	1.211	1.458	1.706	1.954	2.202	2.450	2.698	2.946	3.194	3.442	3.690
0.183	0.408	0.688	0.933	1.178	1.423	1.668	1.913	2.158	2.403	2.648	2.893	3.138	3.383	3.628
0.152	0.400	0.666	0.900	1.200	1.500	1.800	2.100	2.400	2.700	3.000	3.300	3.600	3.900	4.200
0.180	0.393	0.650	0.867	1.133	1.400	1.667	1.933	2.200	2.467	2.733	3.000	3.267	3.533	3.800
0.178	0.388	0.636	0.833	1.111	1.378	1.656	1.933	2.211	2.489	2.767	3.044	3.322	3.600	3.878
0.177	0.384	0.625	0.809	1.077	1.345	1.613	1.881	2.149	2.417	2.685	2.953	3.221	3.489	3.757

Fig. 4. Résistance des trains.

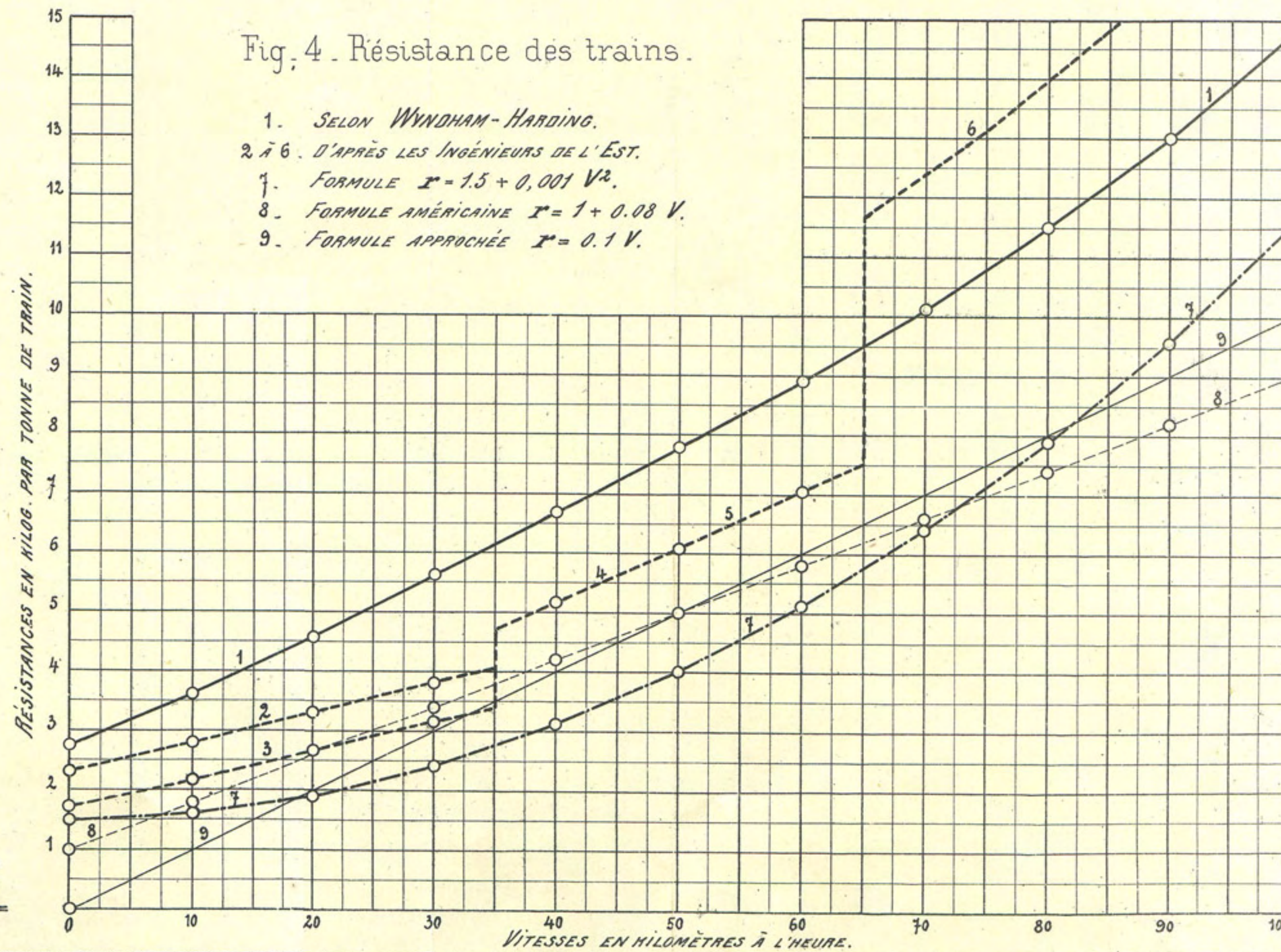


Fig.1 à 3. Dynamomètre d'inertie de M. Desdouits.

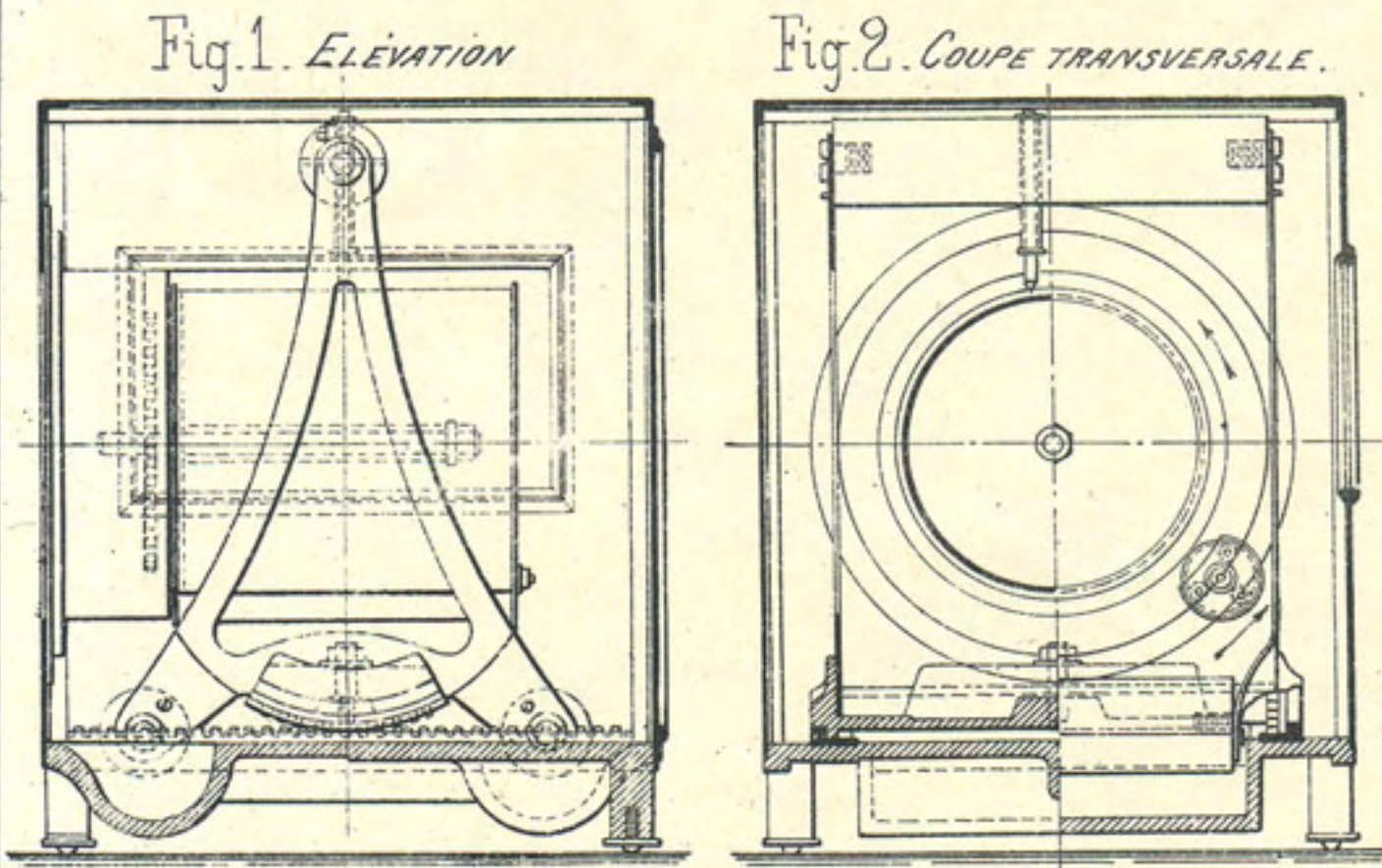


Fig. 3. PLAN.

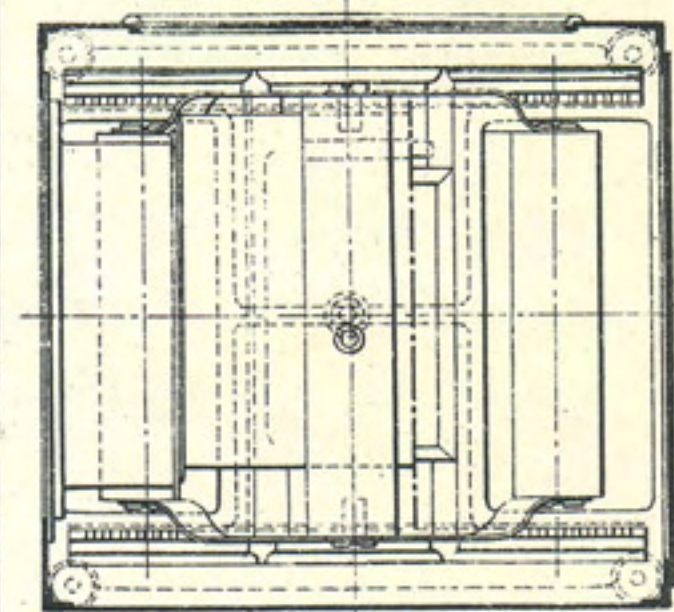


Fig.4 à 7. Enregistreur de vitesse système Haushälter.

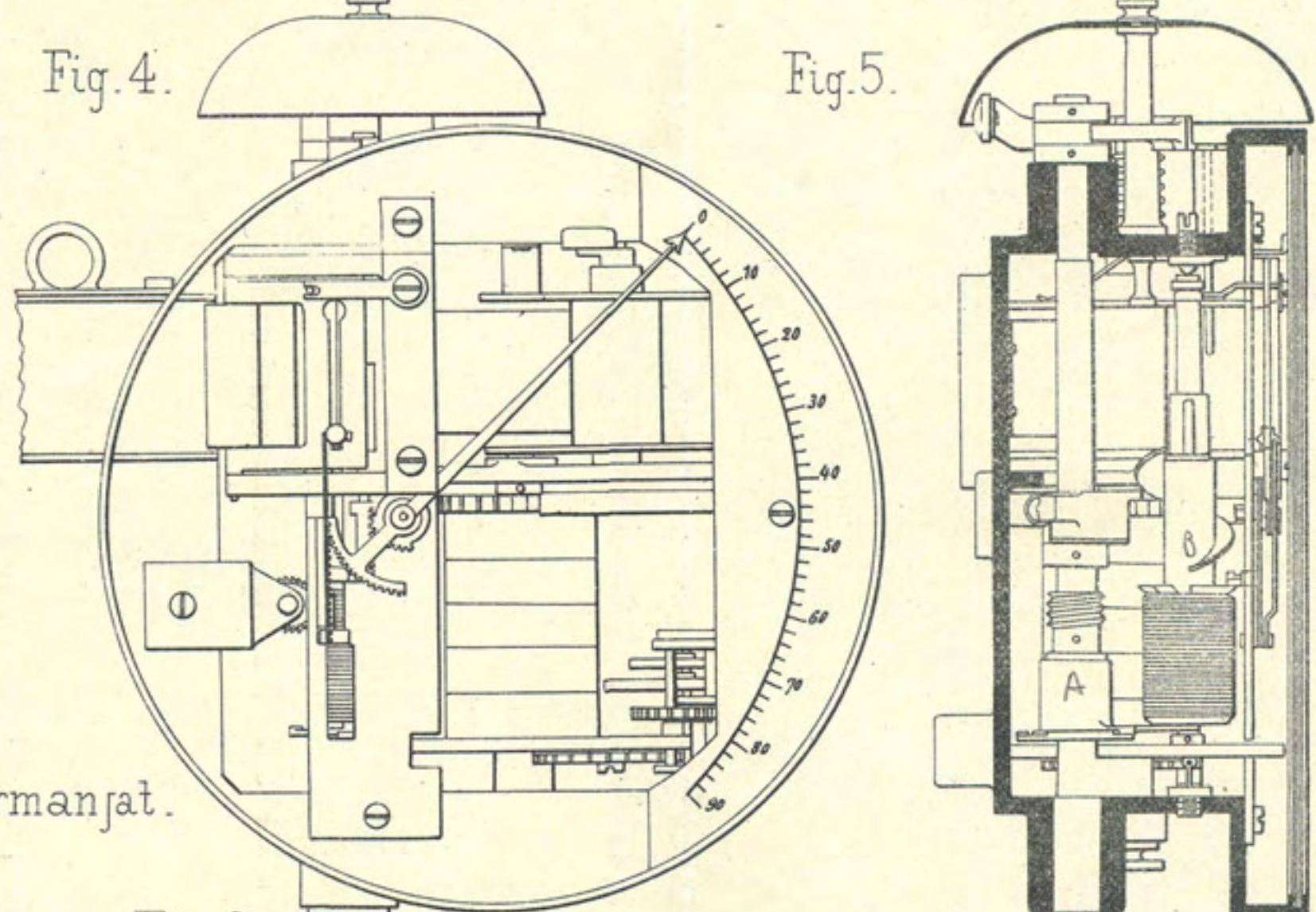


Fig. 6.

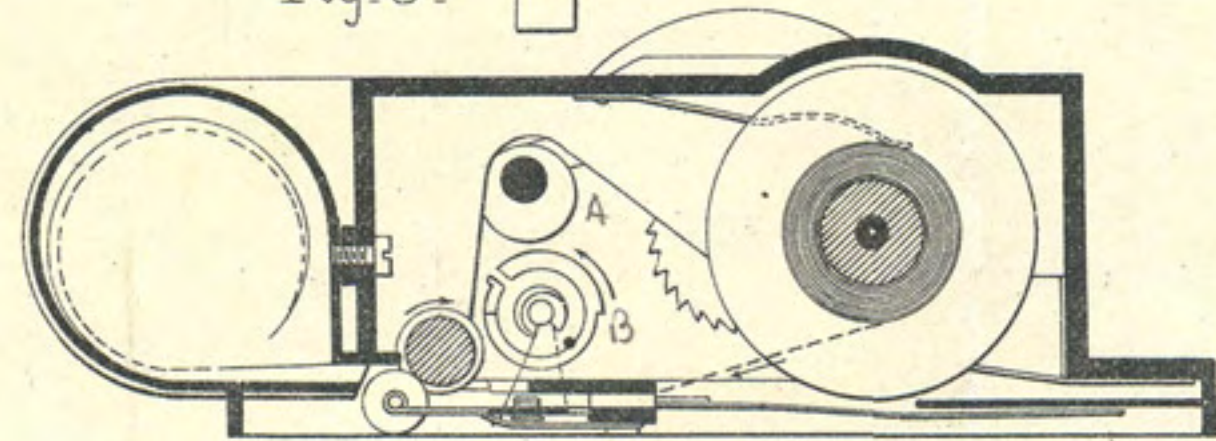


Fig. 7.

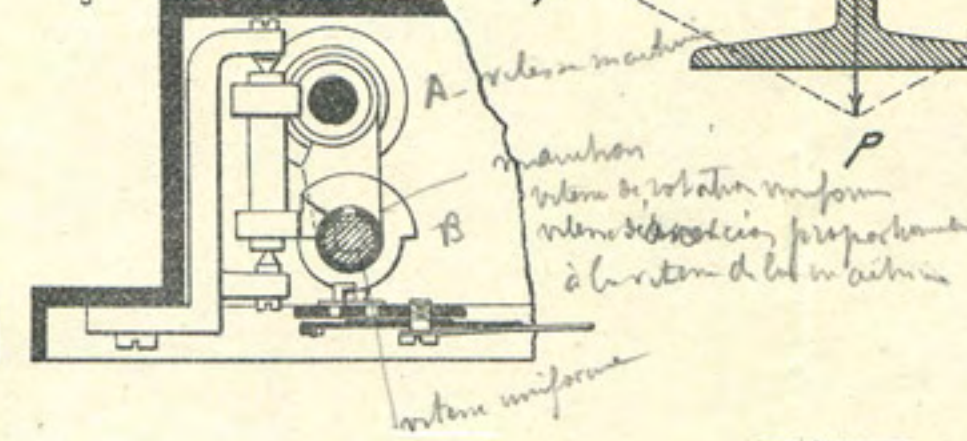


Fig. 8. Indicateur de vitesse système Bruggemann.

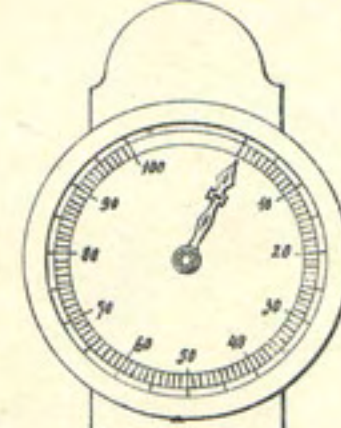


Fig. 9. Roue à gorge.

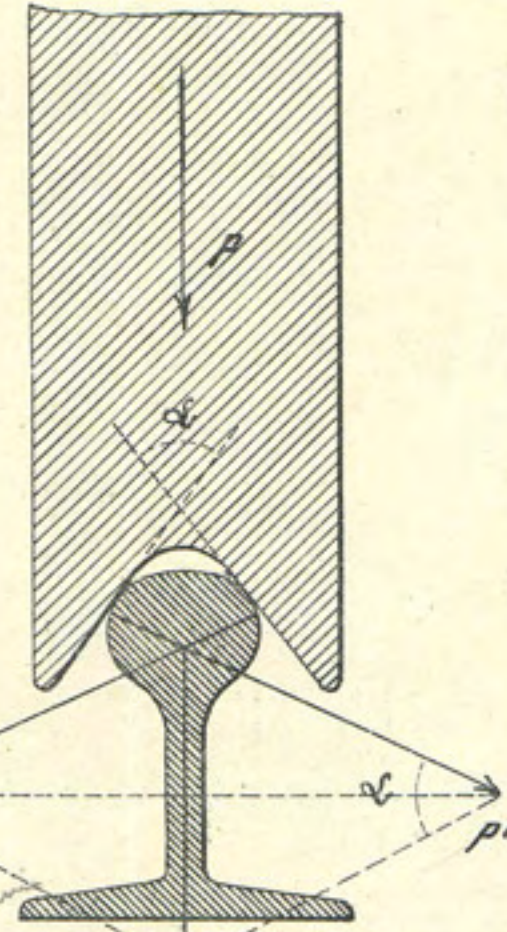


Fig. 13 et 14. Locomotive système Fell du Mont-Cenis.

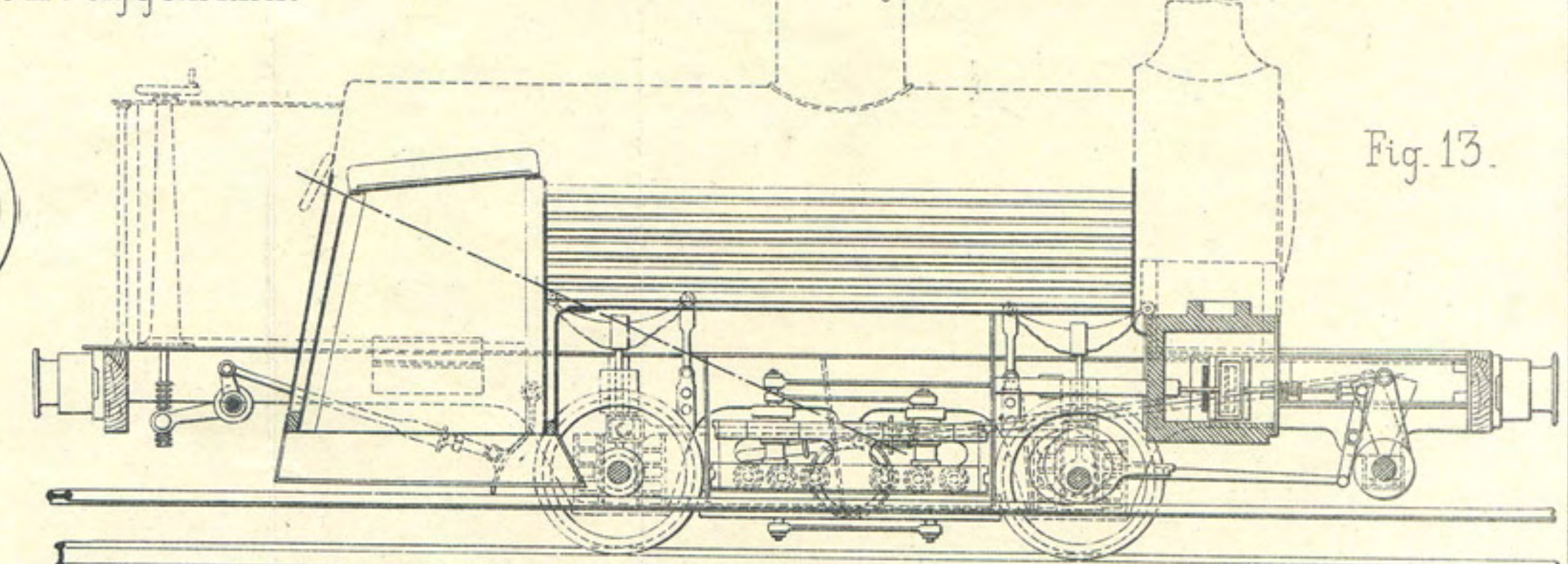


Fig. 13.

Fig. 14.

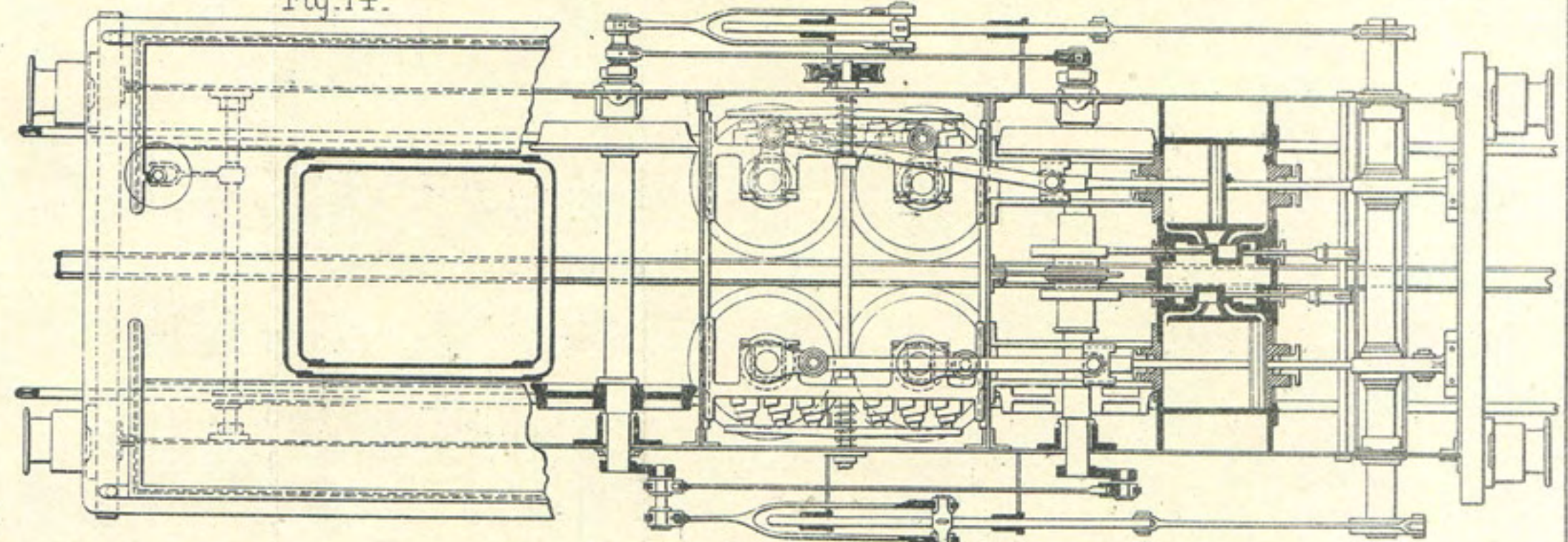


Fig. 16. Locomotive système Larmanjat.

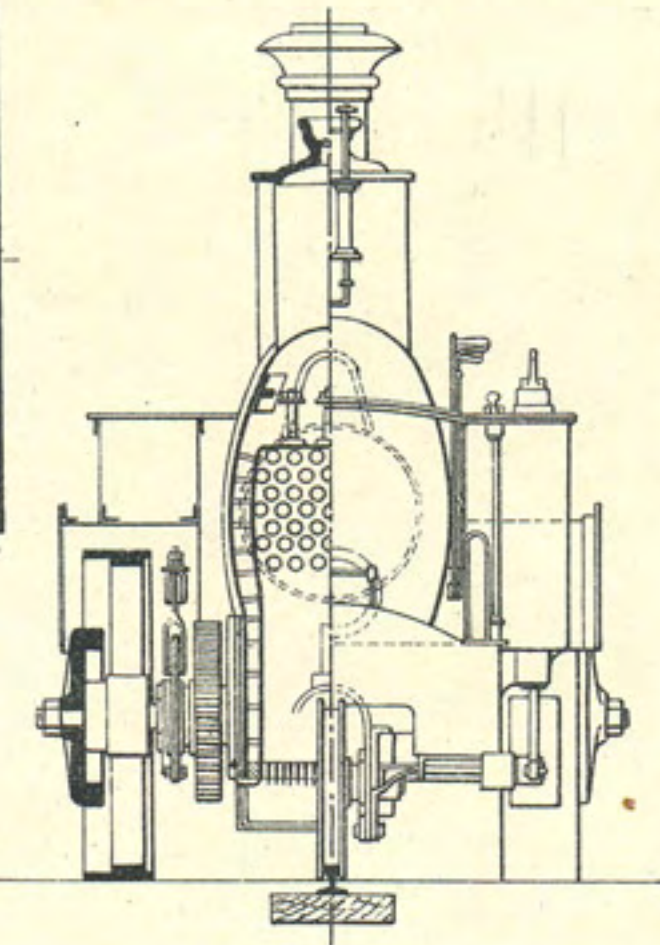


Fig. 17. Locomotive à tender moteur du Grand Central Belge.

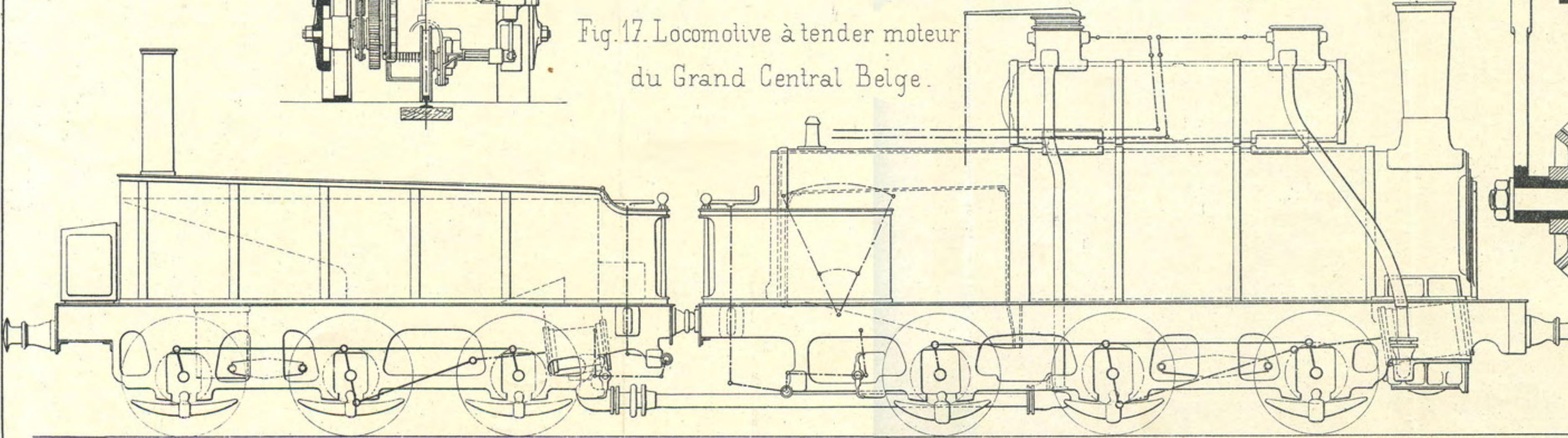


Fig. 11 et 12. Sablière à vapeur système Gresham et Craven.

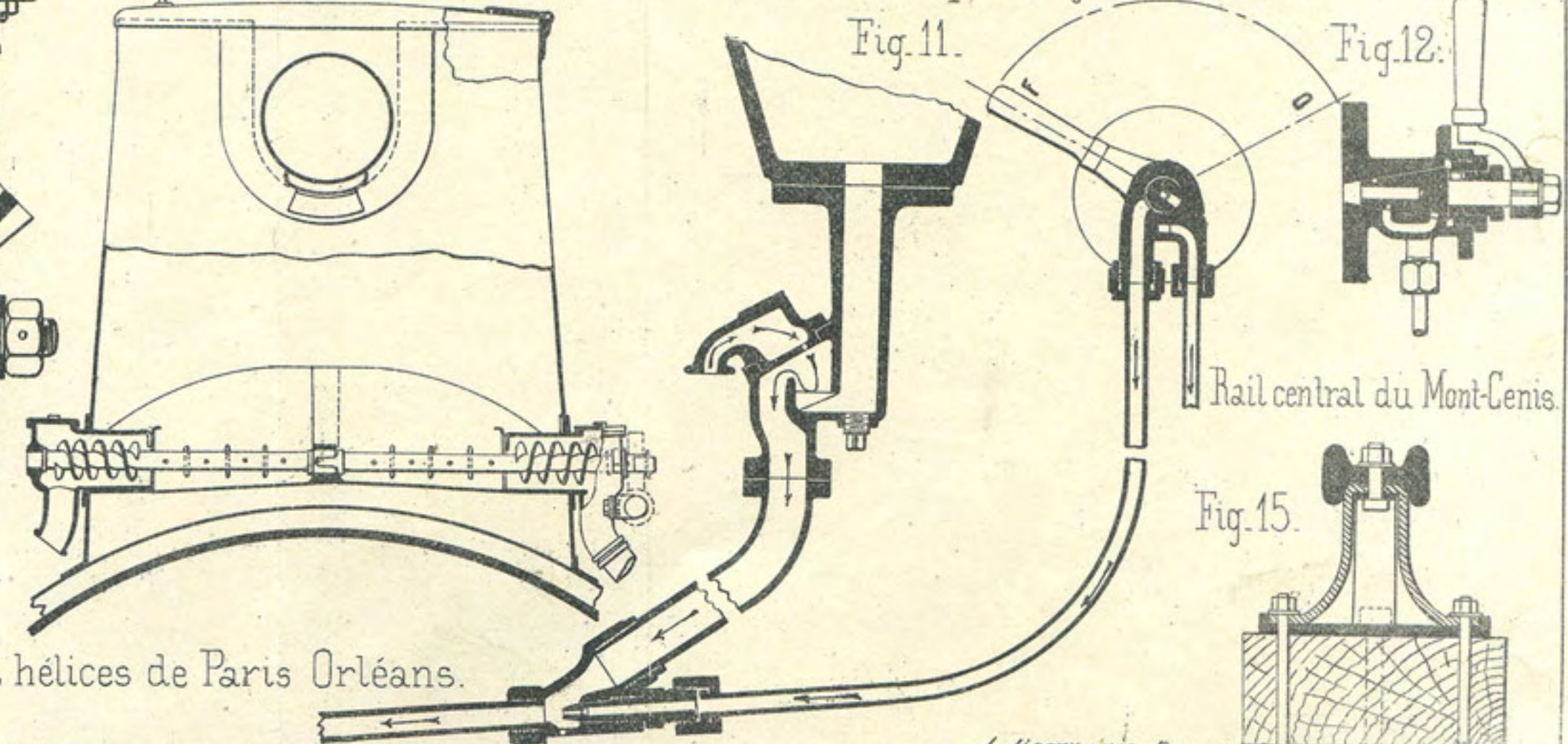


Fig. 11.

Fig. 12.

Rail central du Mont-Cenis.

Fig. 15.

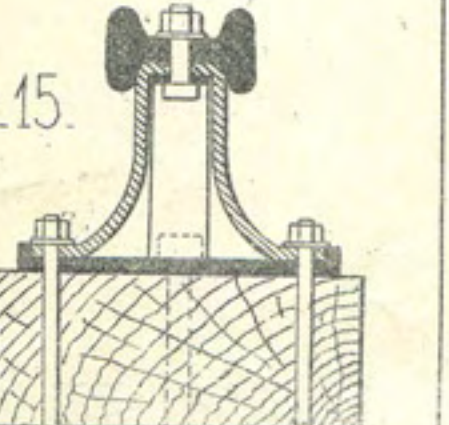


Fig. 10.

Sablière à 2 hélices de Paris Orléans.

Fig. 1. Locomotive à engrenages de Shay.

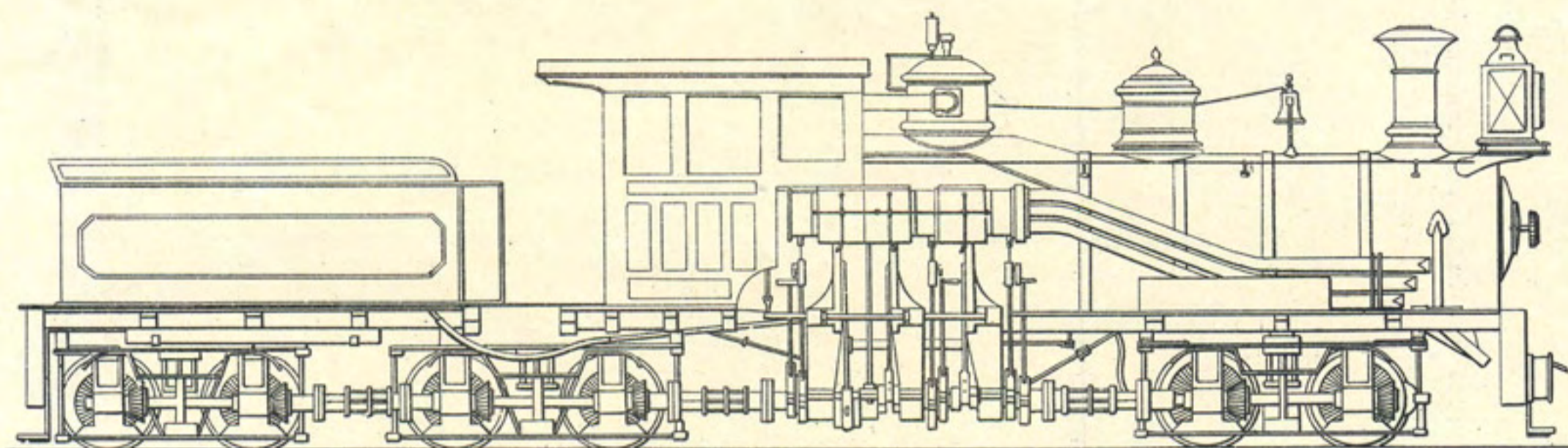


Fig. 5. Locomotive Bavaria.

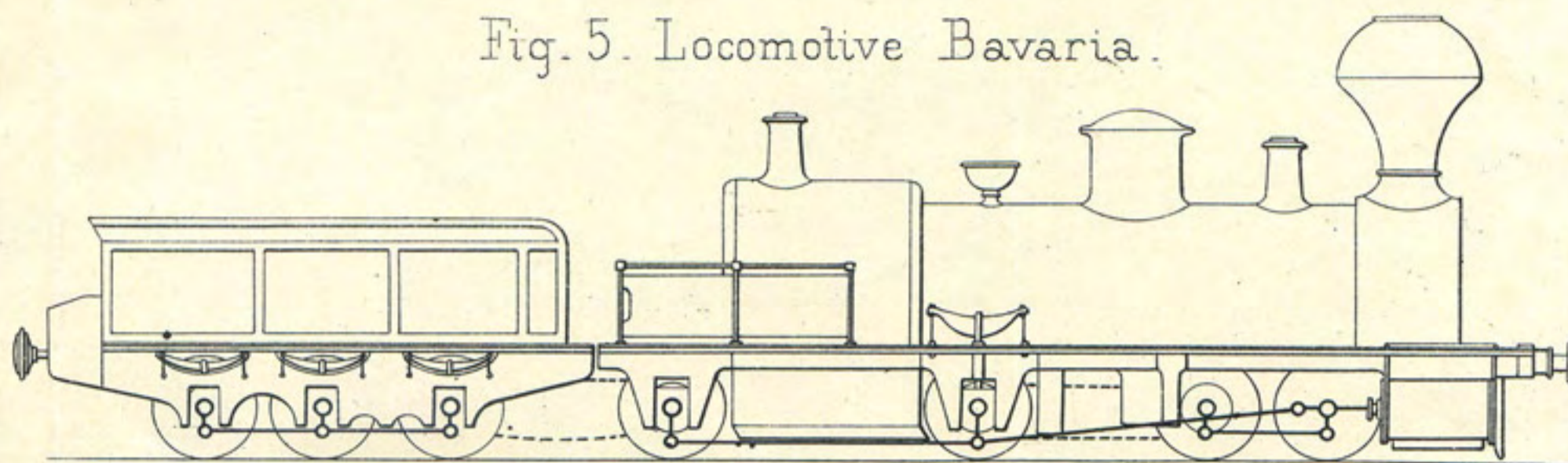


Fig. 3 et 4. Accouplement par engrenages.

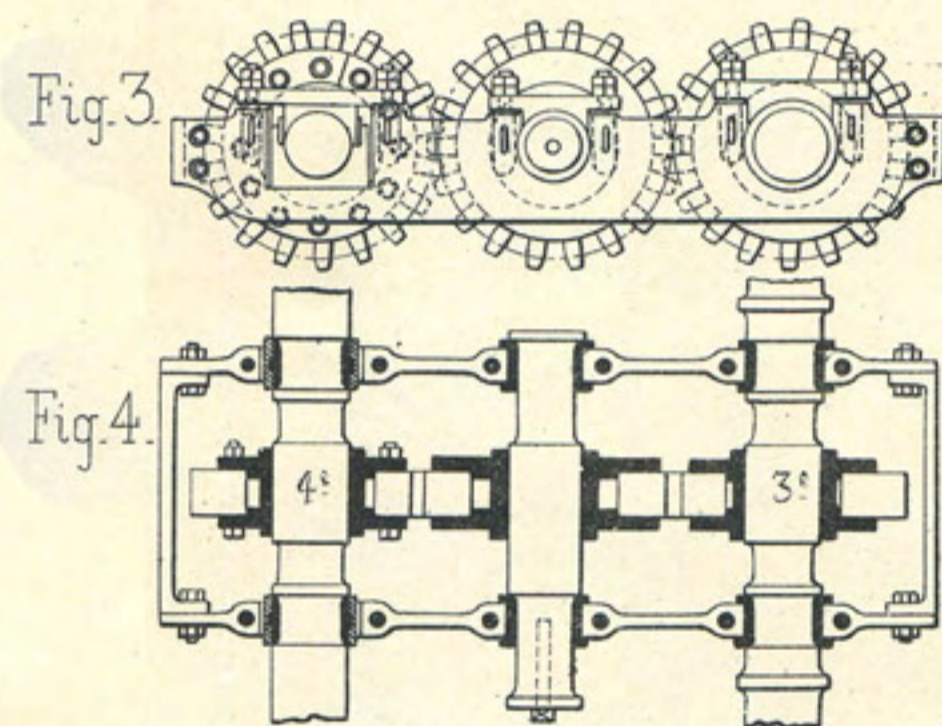


Fig. 13. Locomotive du Rigi.

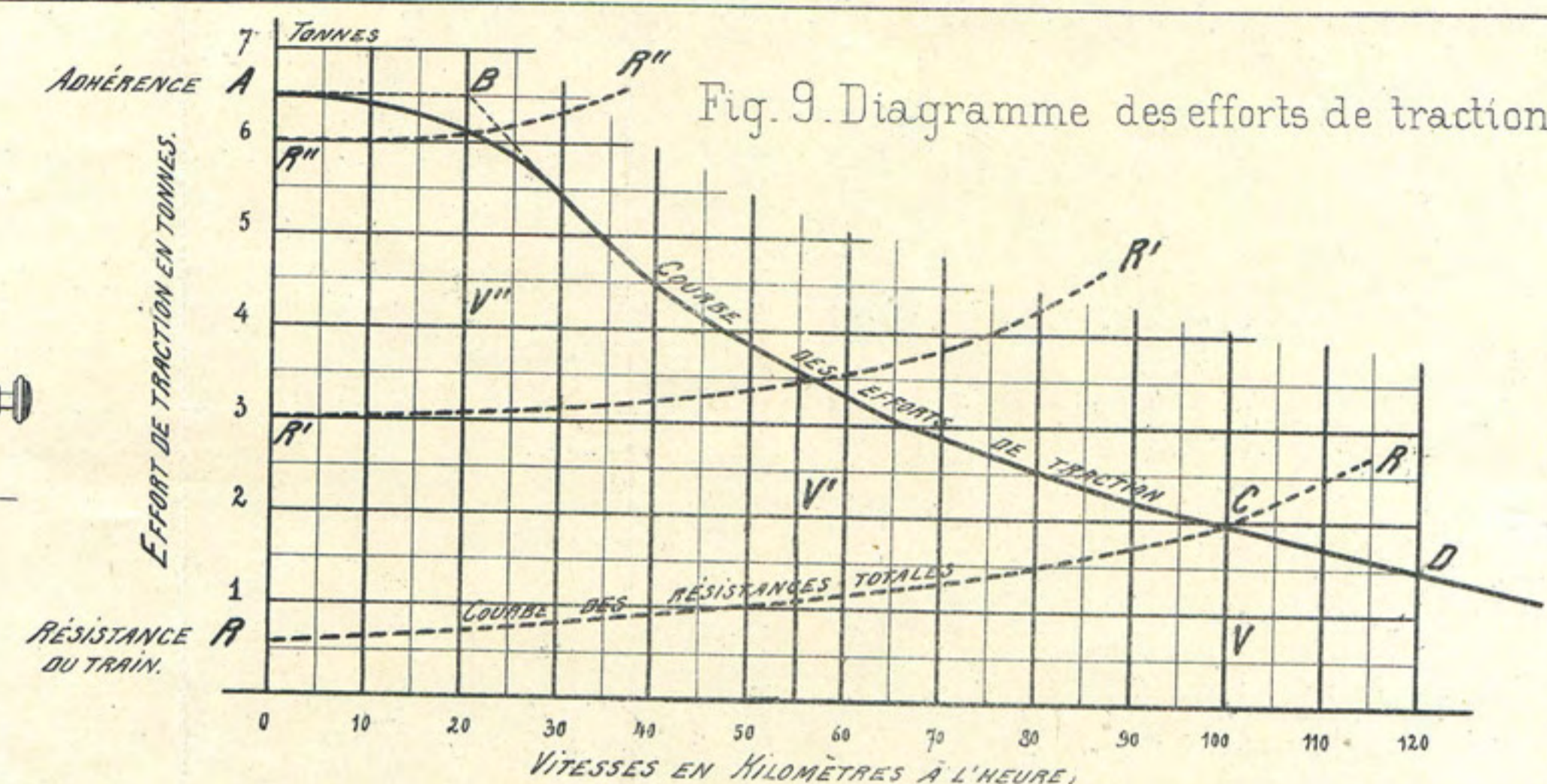
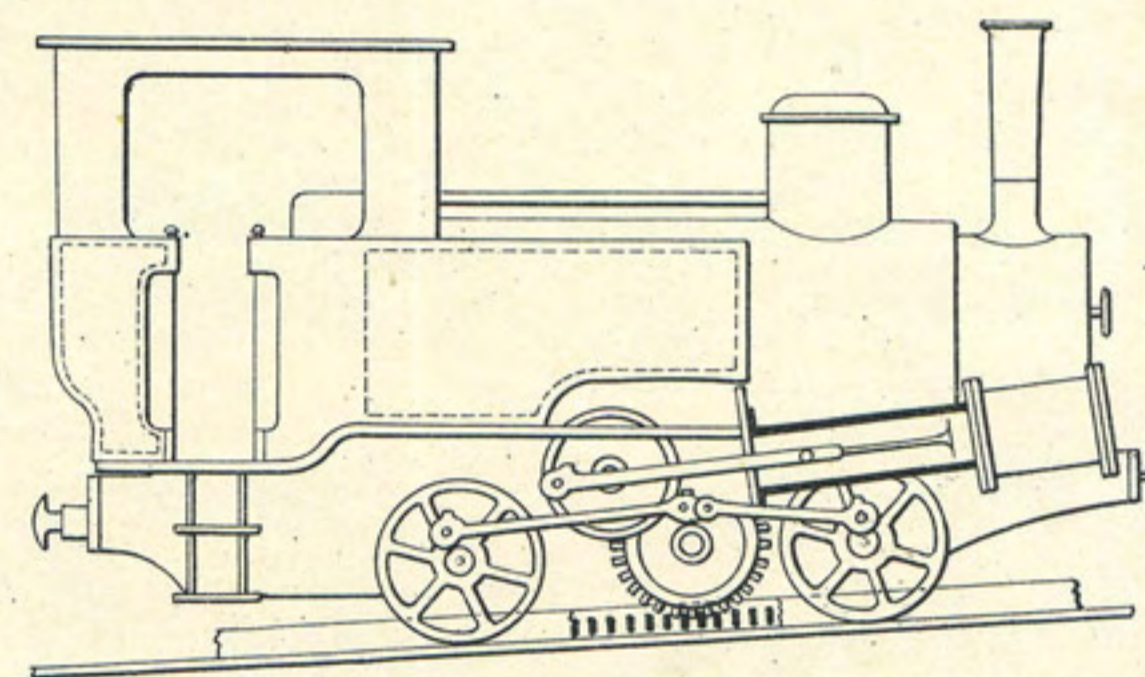


Fig. 2 à 4. Locomotive Engerth.

Fig. 2. COUPE LONGITUDINALE.

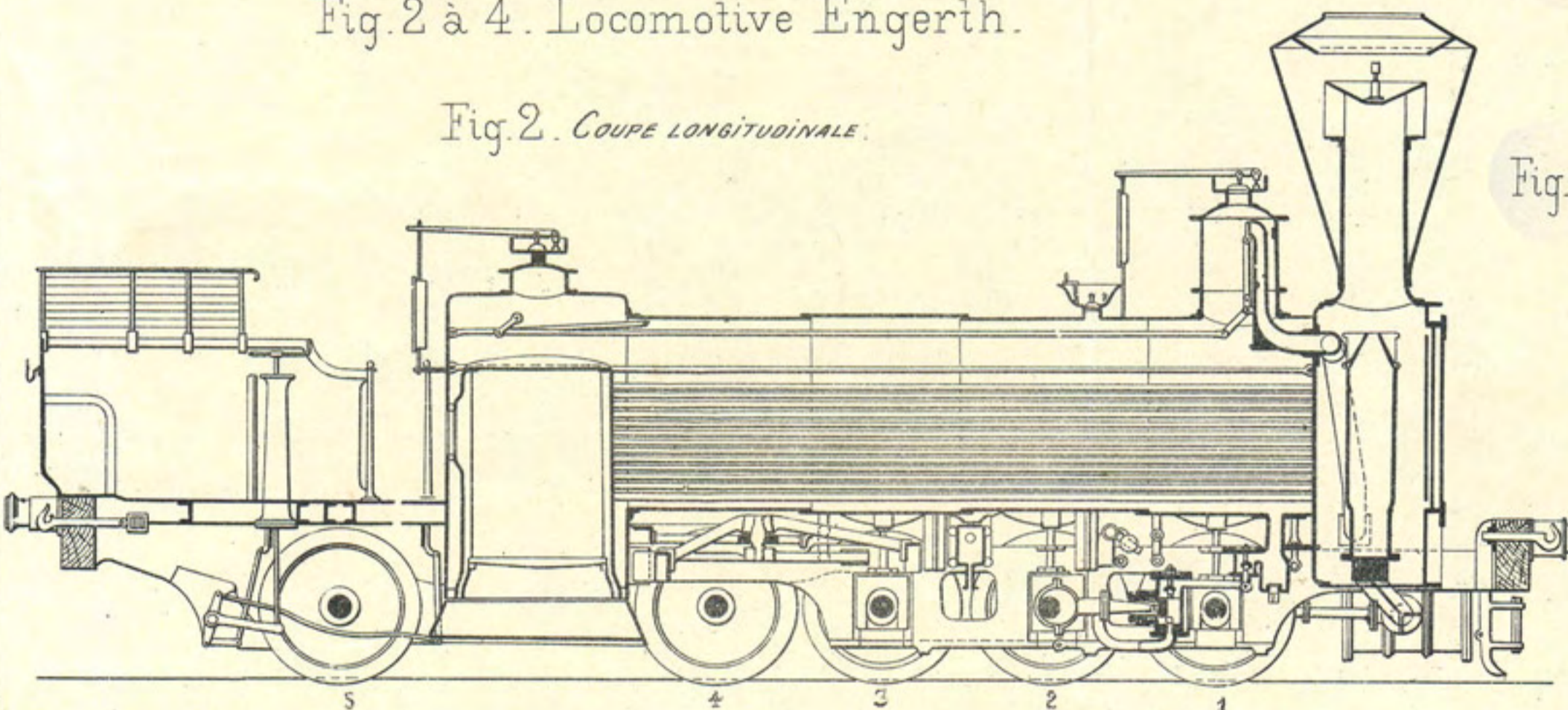


Fig. 10. Crémaillère de Riggbach. Fig. 11. Crémaillère de Locher. Fig. 12. Crémaillère de Abt.

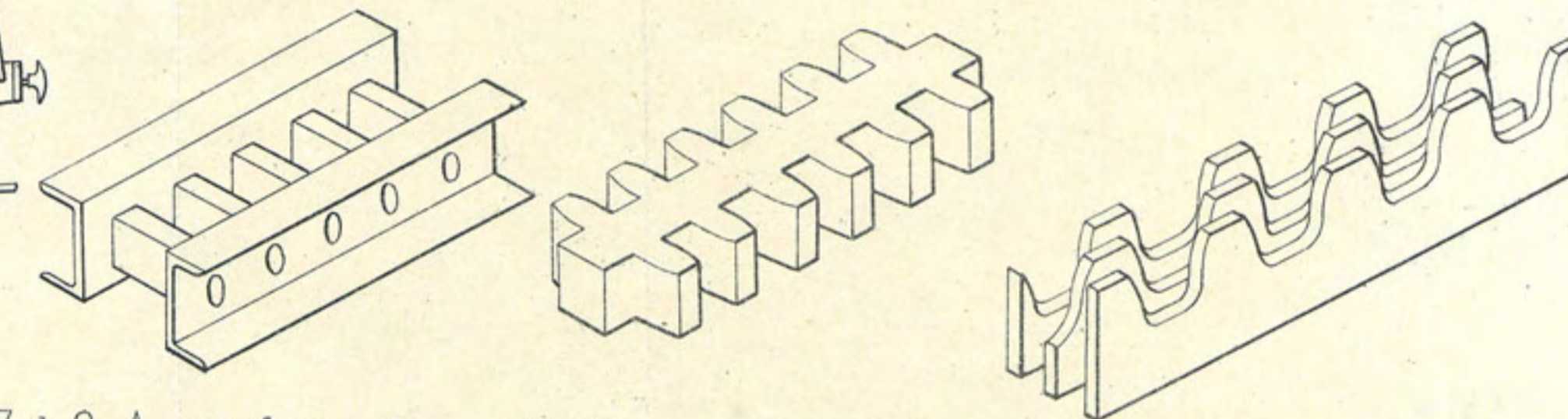


Fig. 14. Accélérateur du frein Lipkowski.

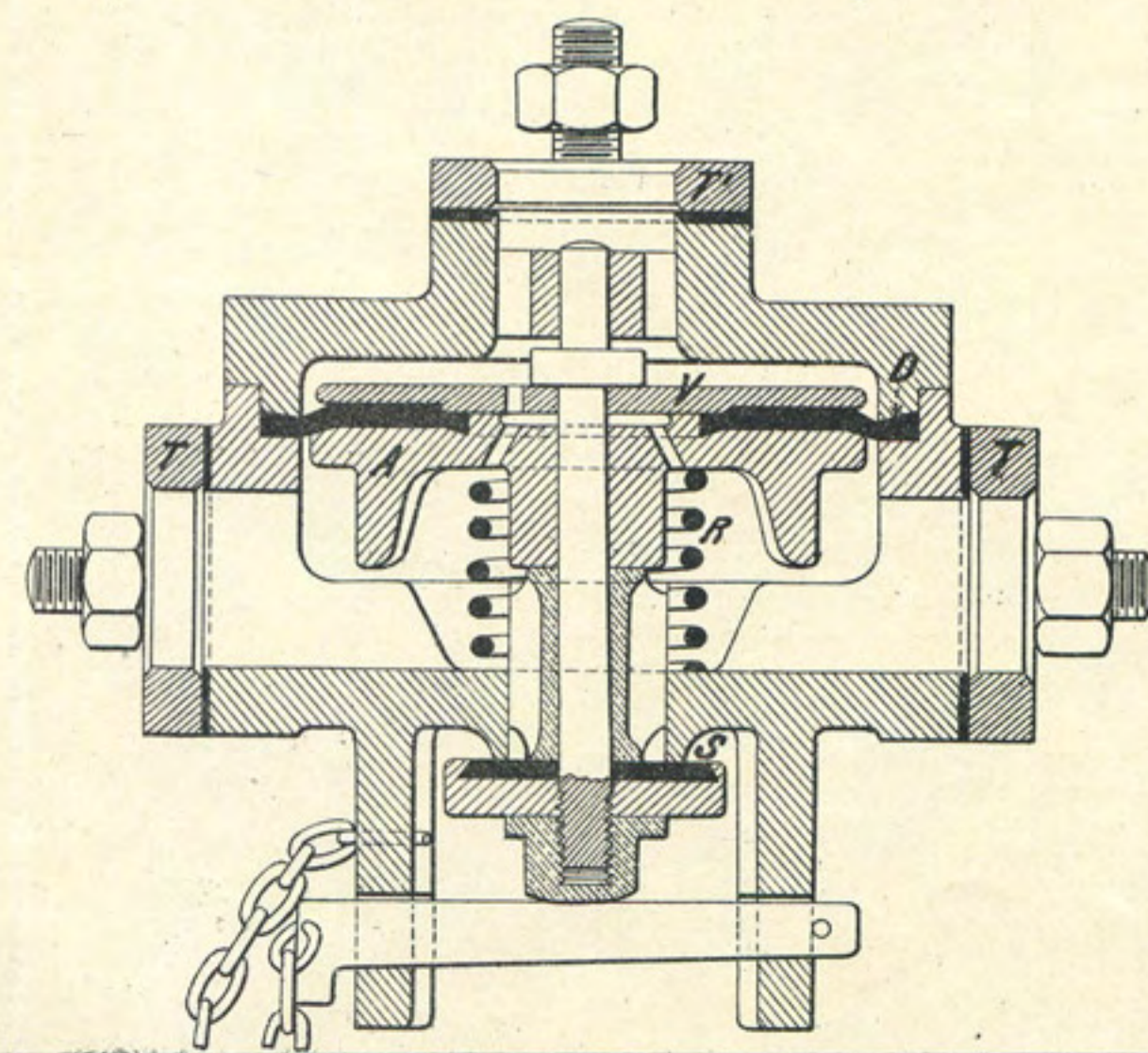


Fig. 7 et 8. Accouplement par bielle unique médiane.

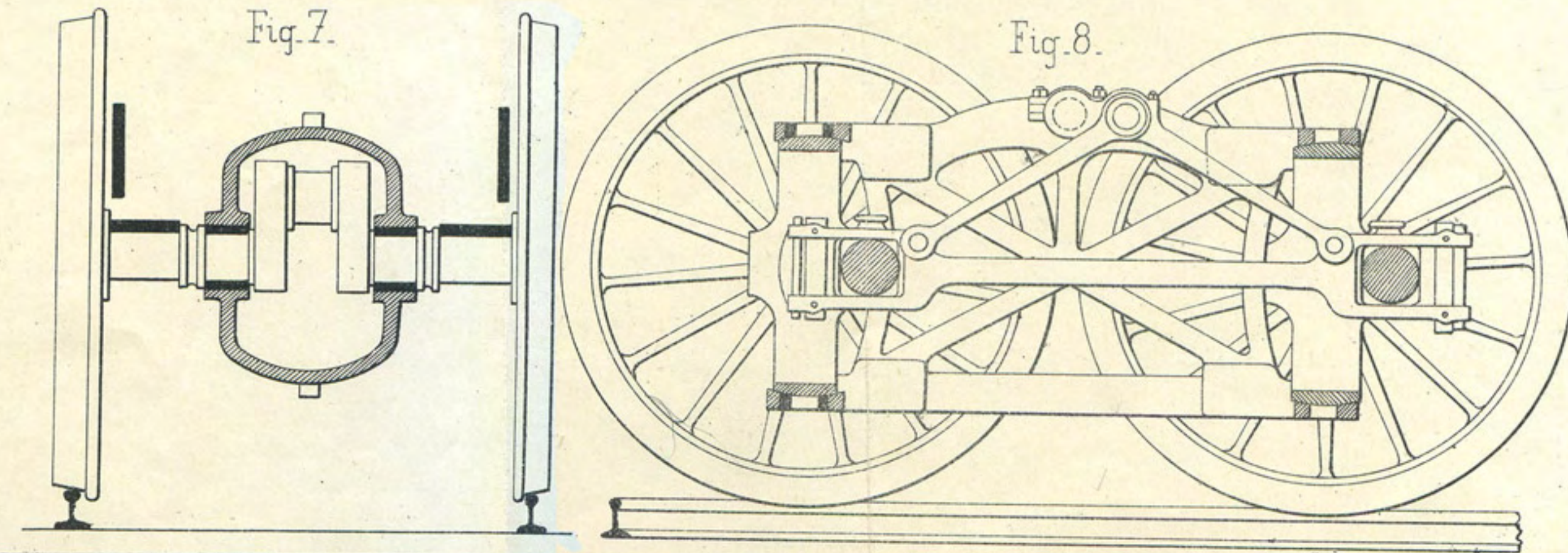


Fig. 6. Accouplement système Hagans.

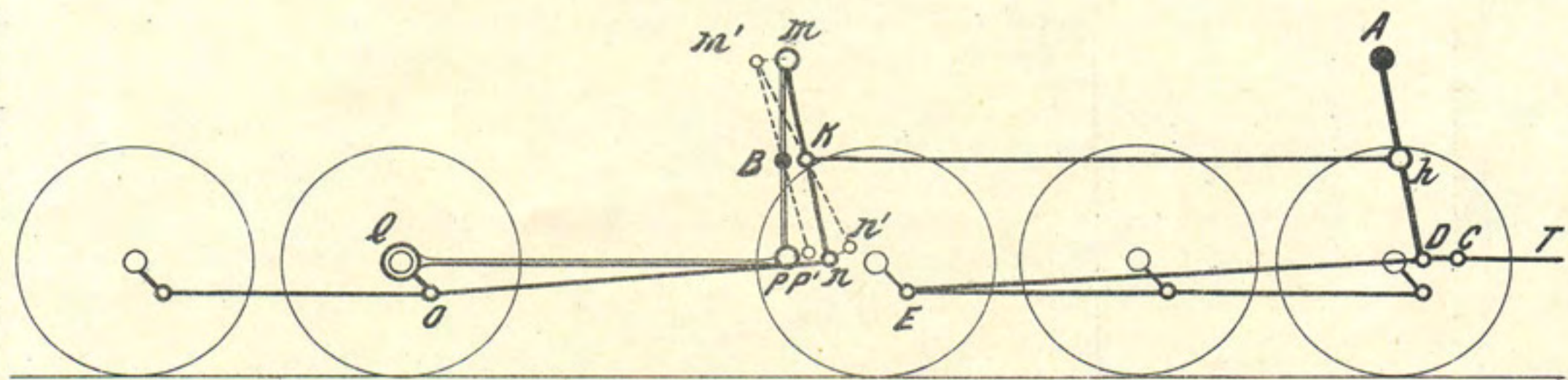


Fig.1 et 2 Fourgon d'expériences de la 2<sup>e</sup> série d'essais.

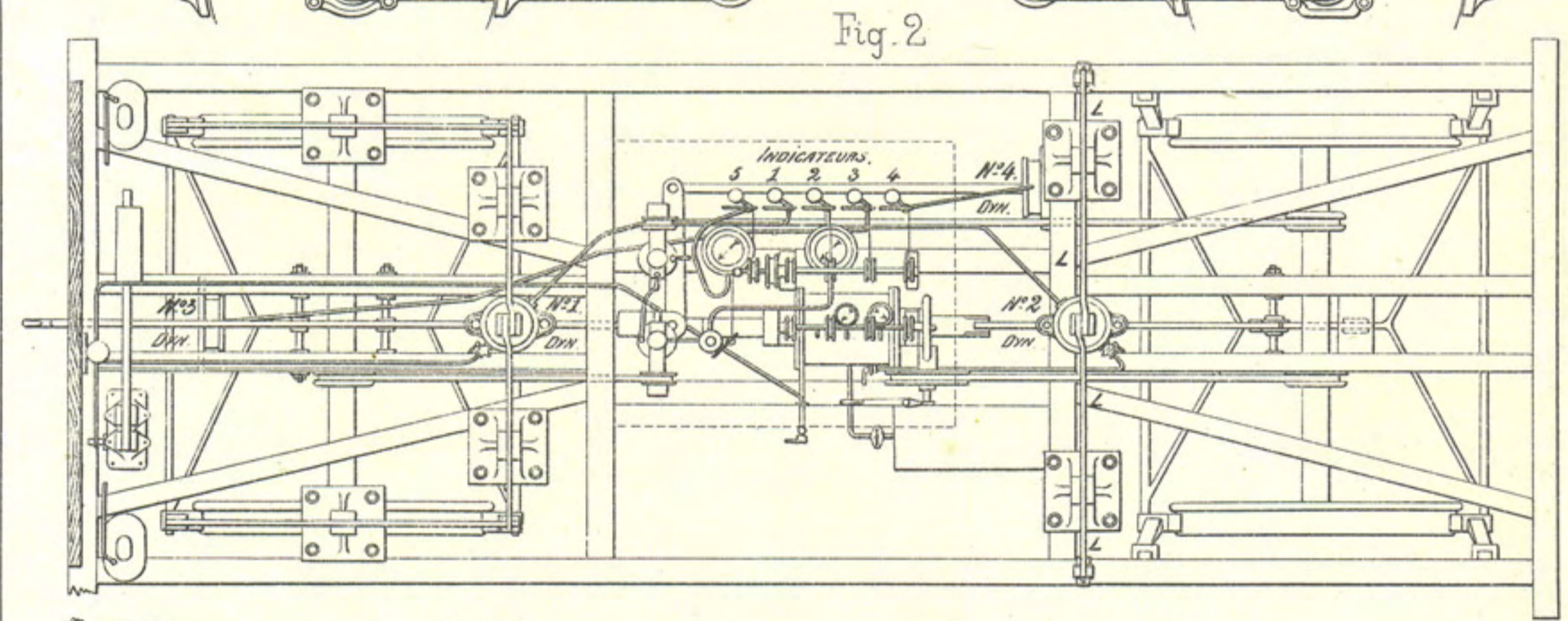
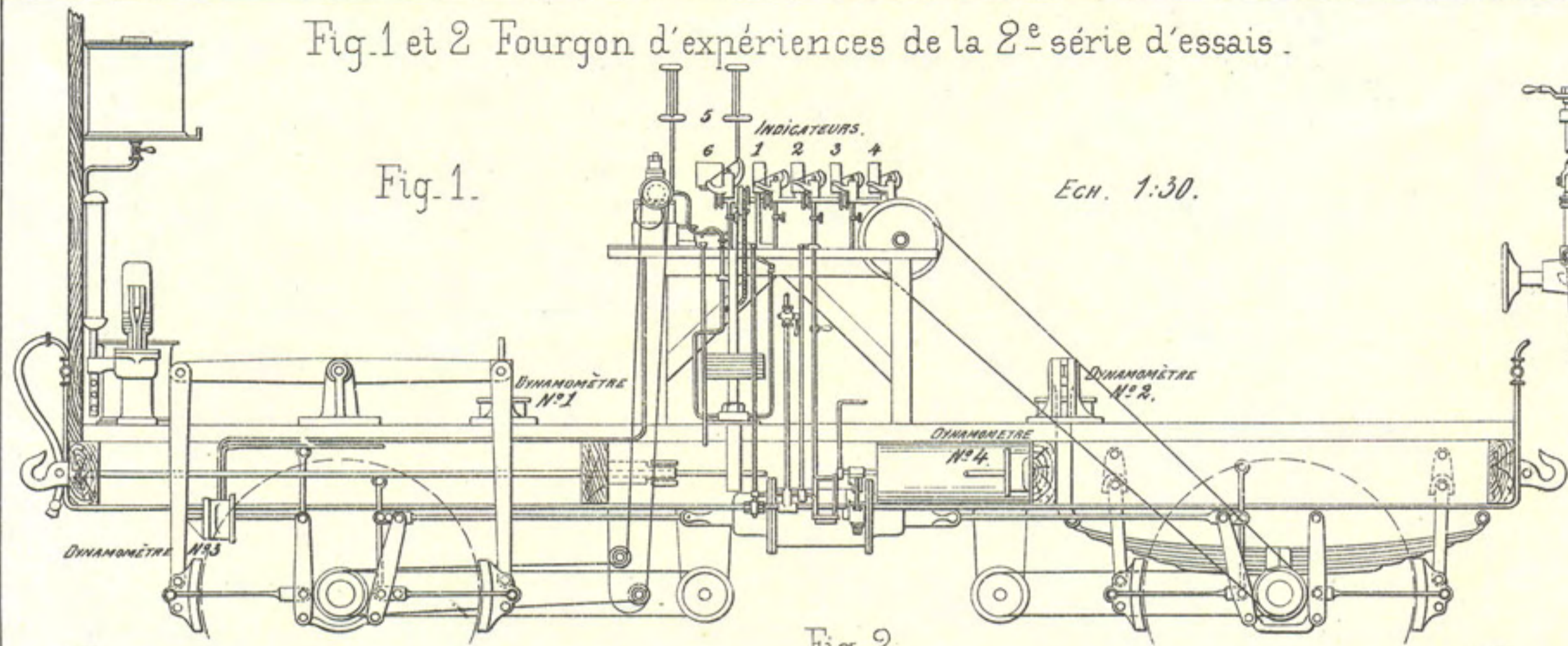


Fig.3. Fourgon d'expériences de la 1<sup>e</sup> série d'essais.

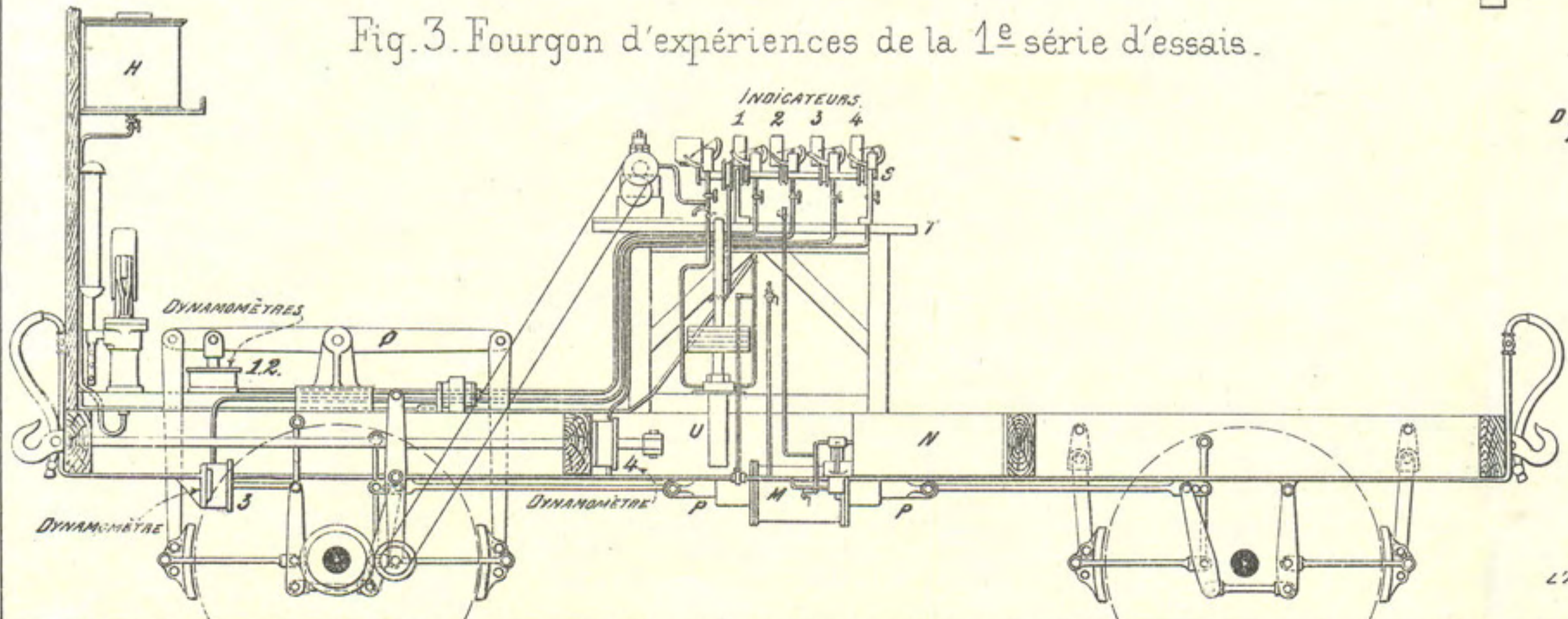


Fig.5 et 6. Timonerie du frein des voitures à 3 essieux de l'Etat Belge. Ech. 1/40.

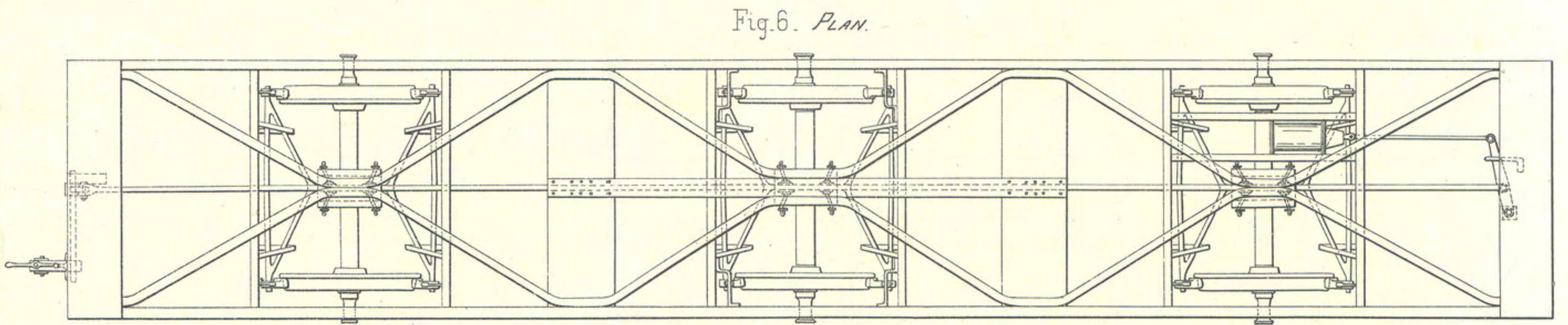
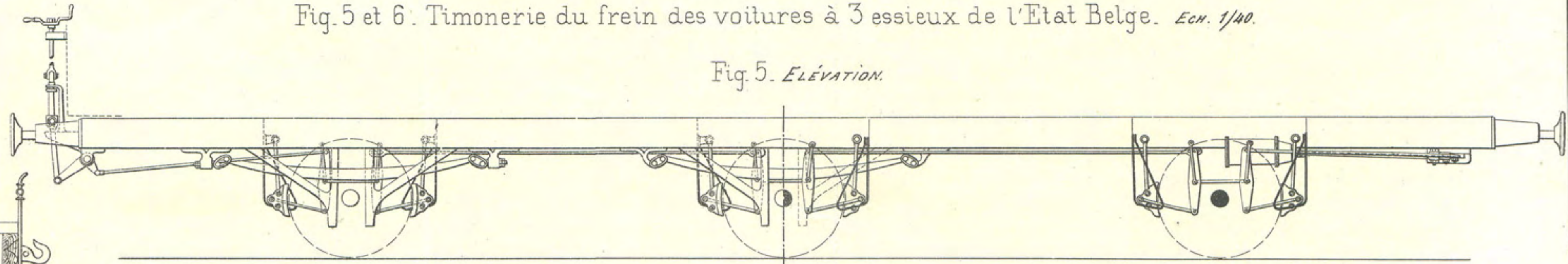


Fig.8 et 9. Suspension de blocs, système Zara.

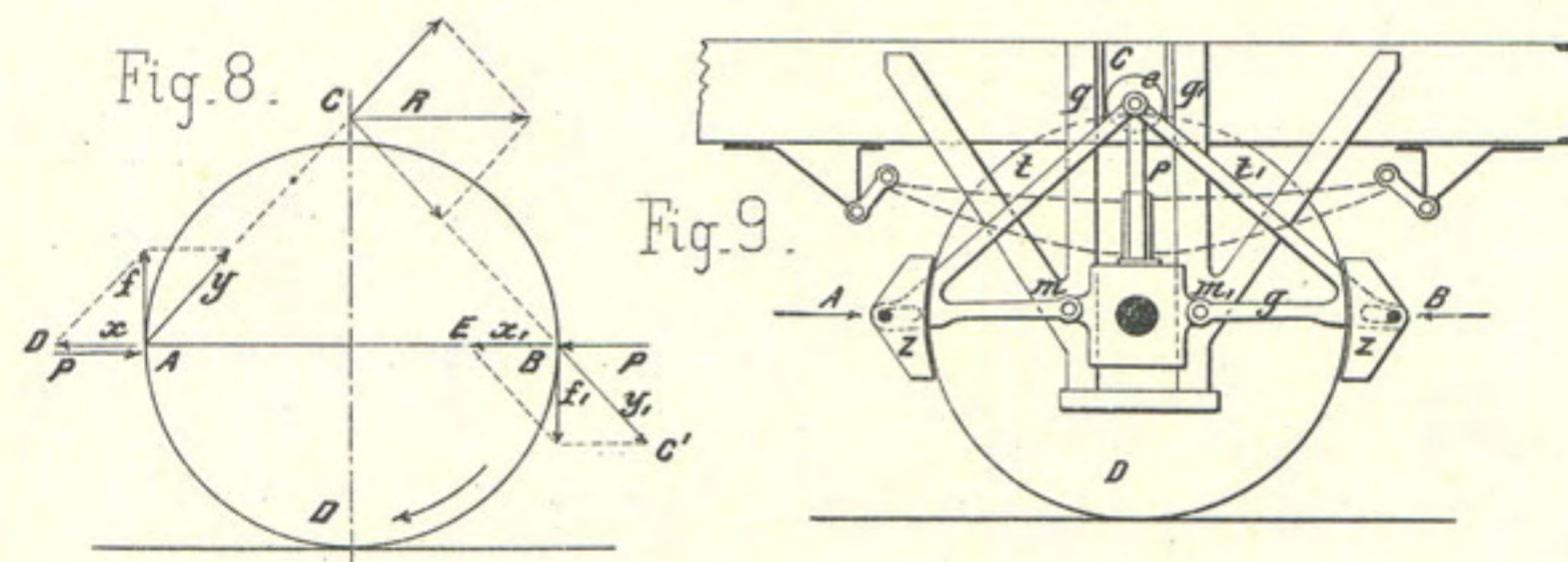


Fig.7. Frein américain (Anciens wagons Etat-Belge).

ECHELLE 1:40.

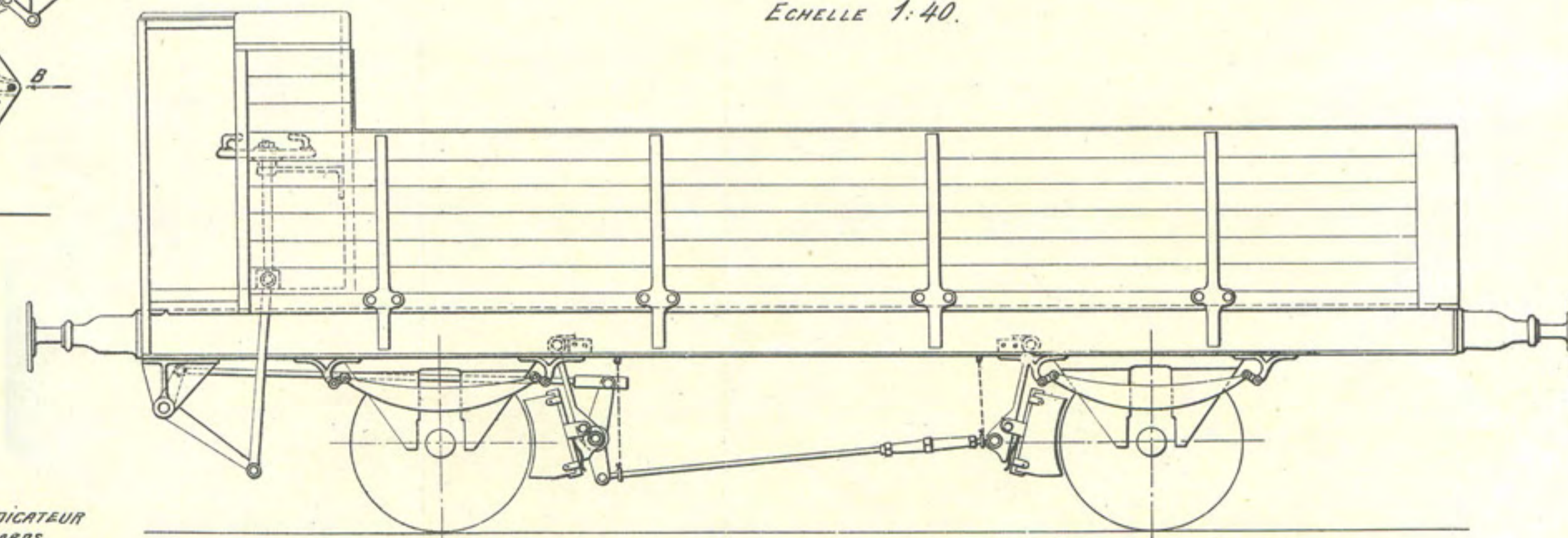
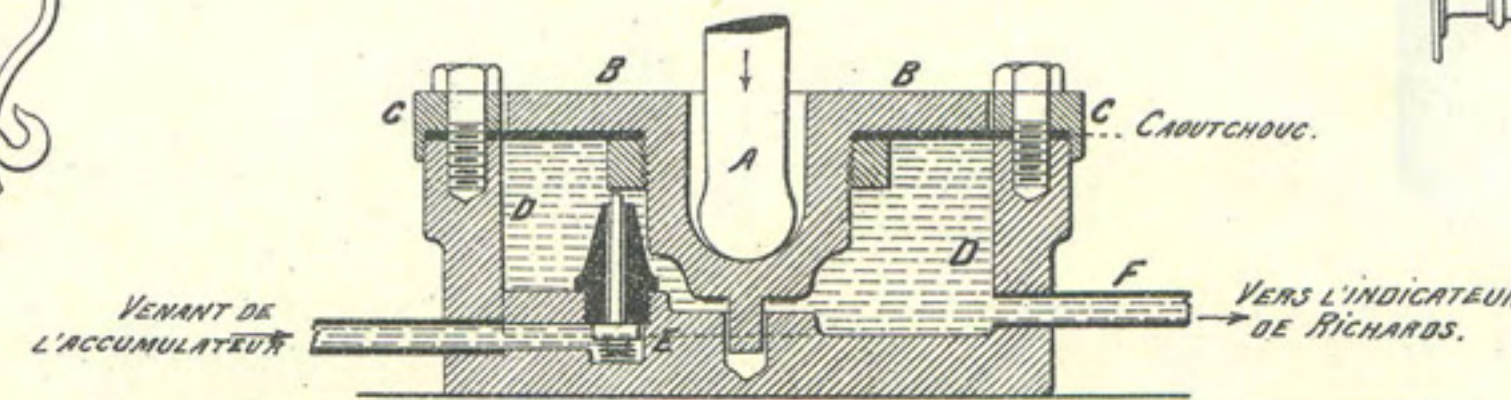
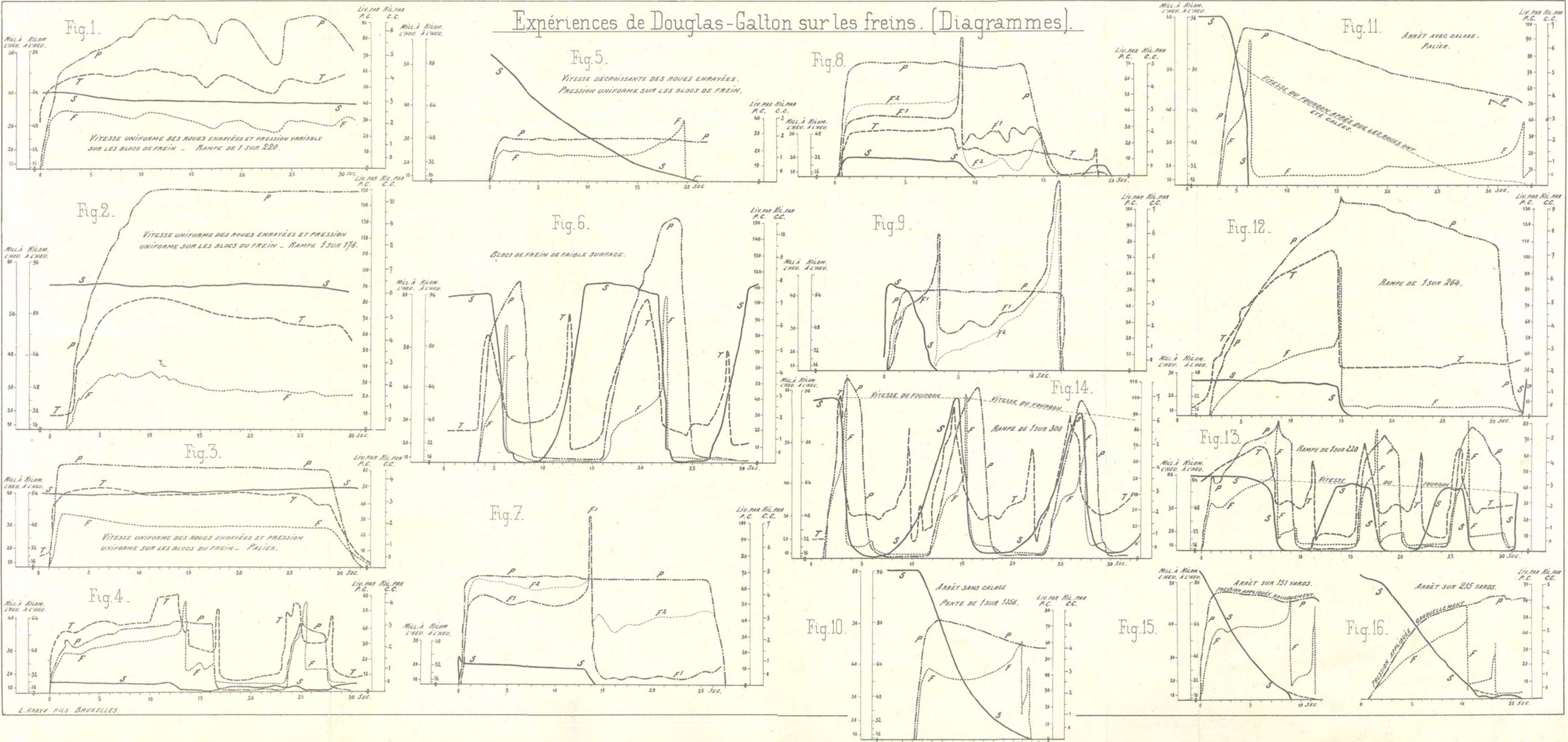
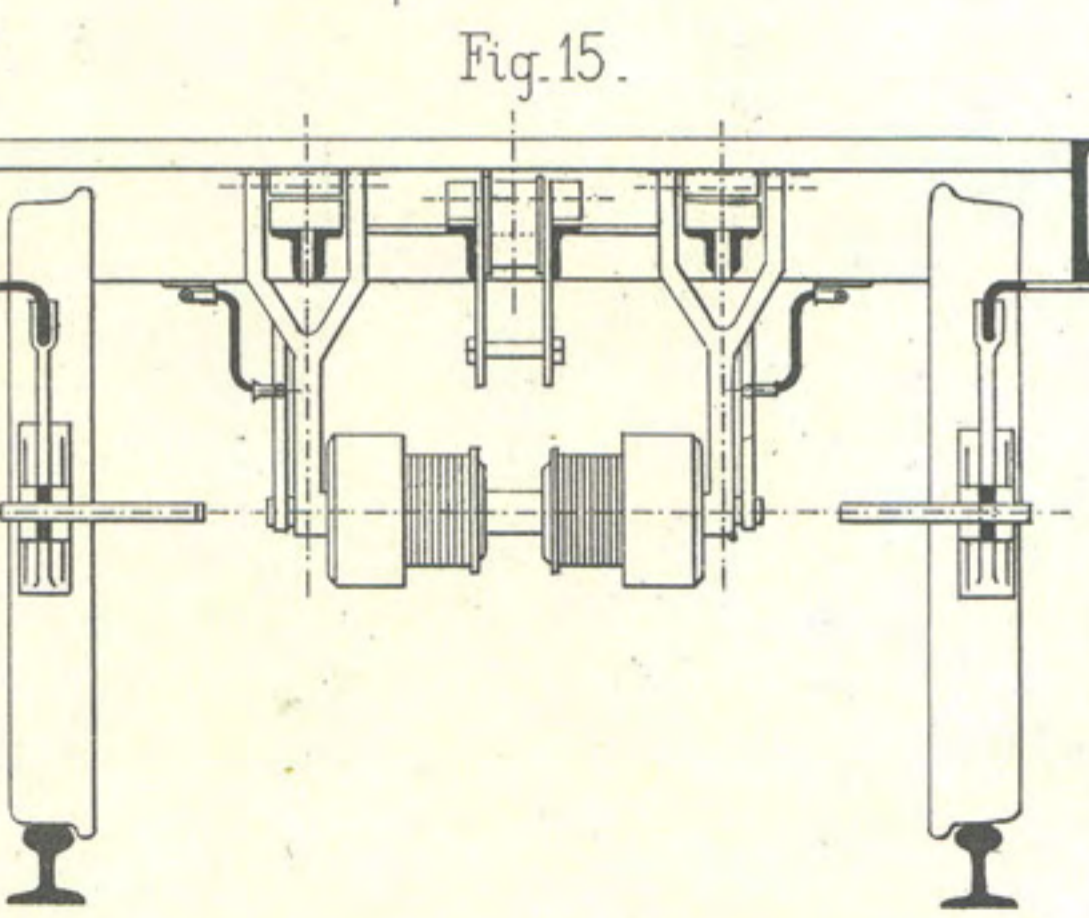
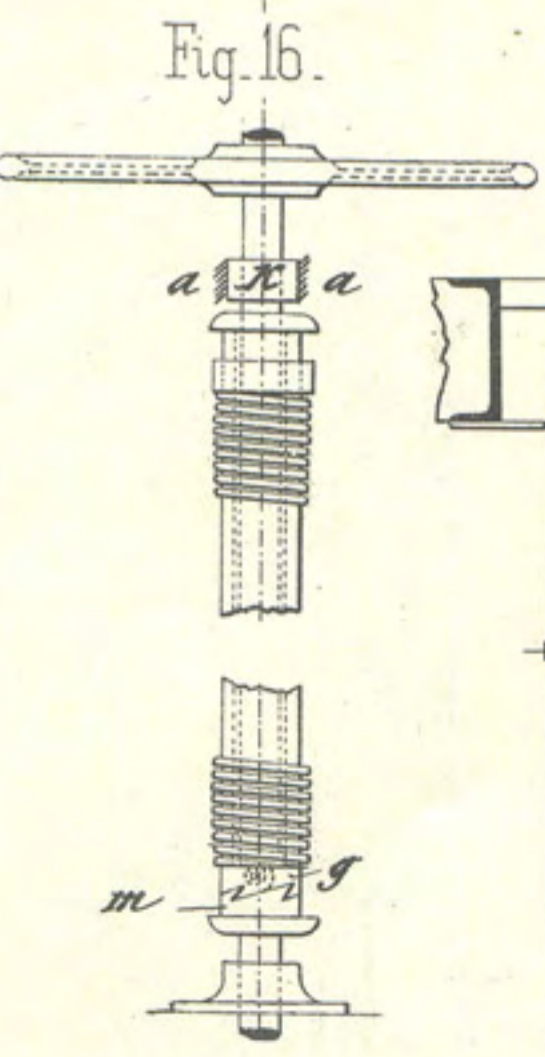
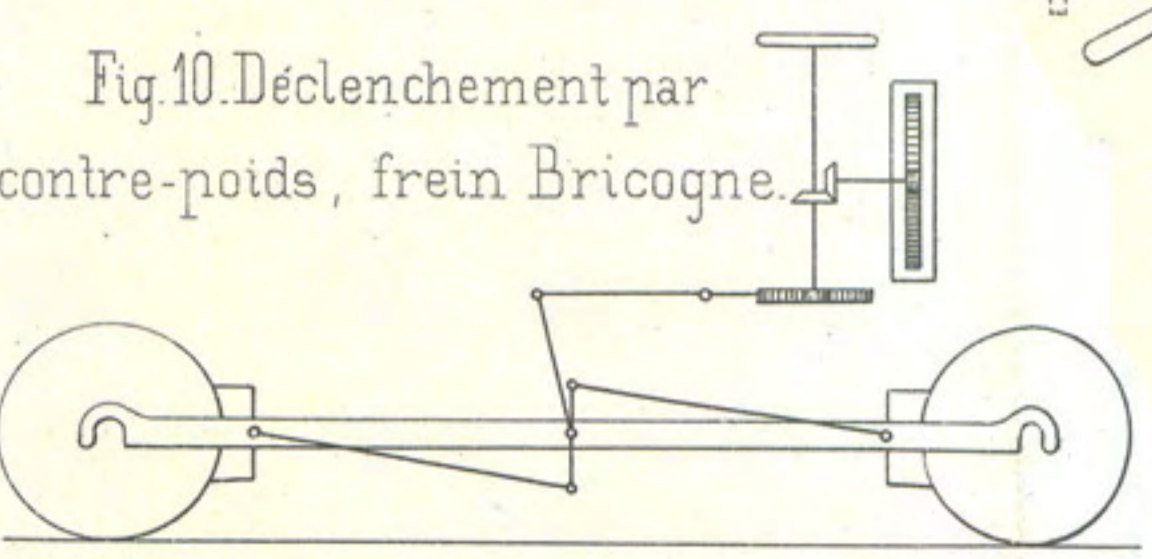
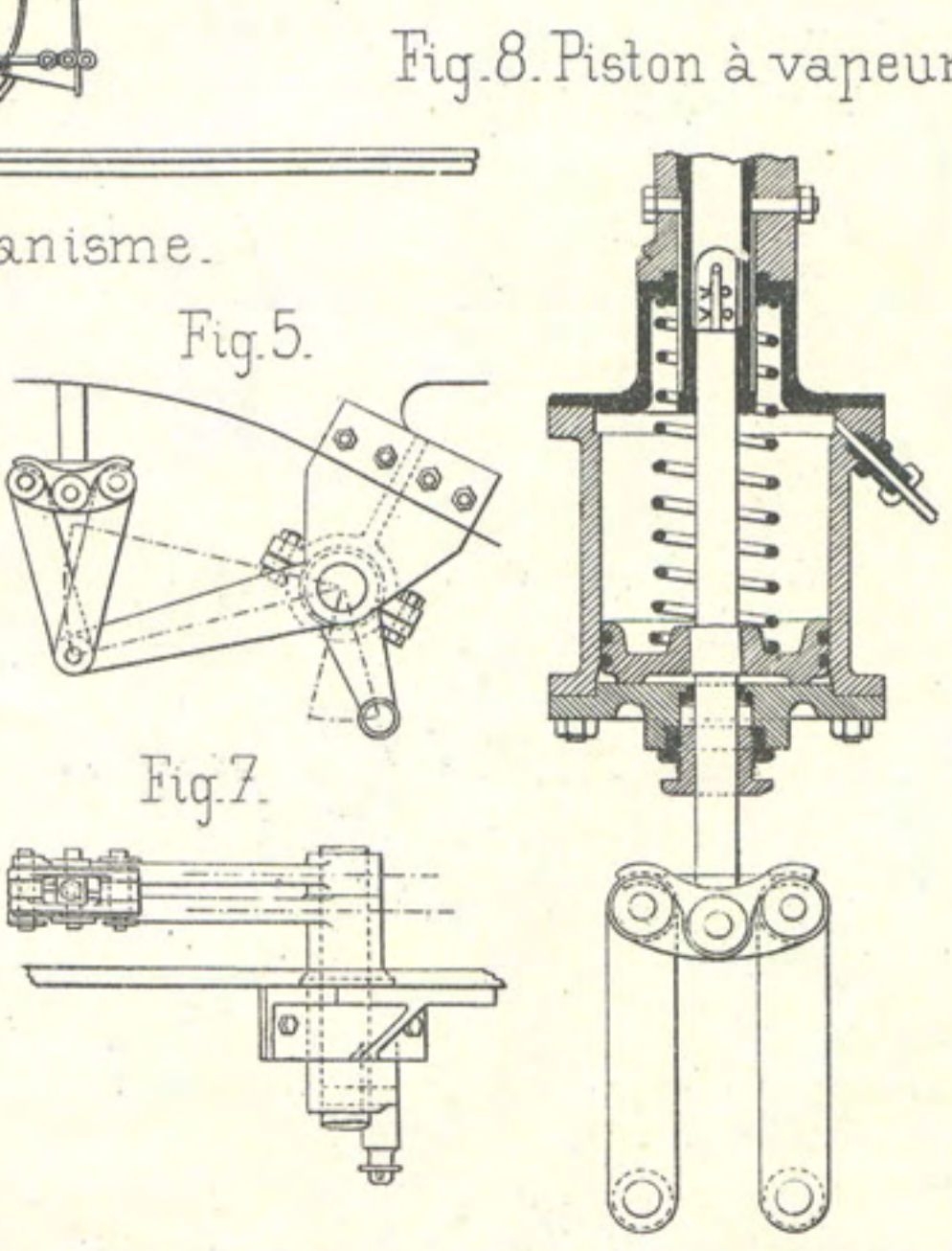
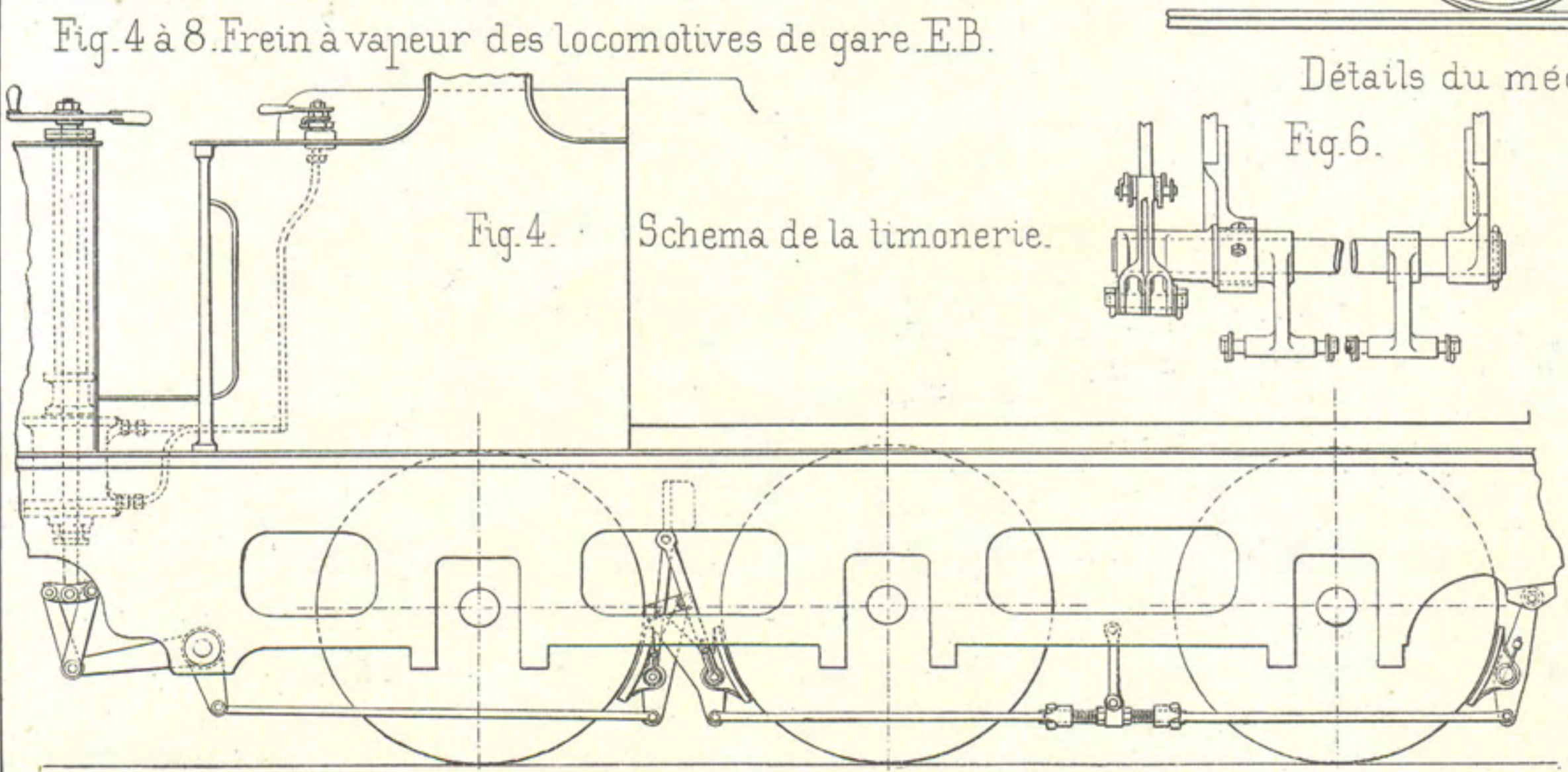
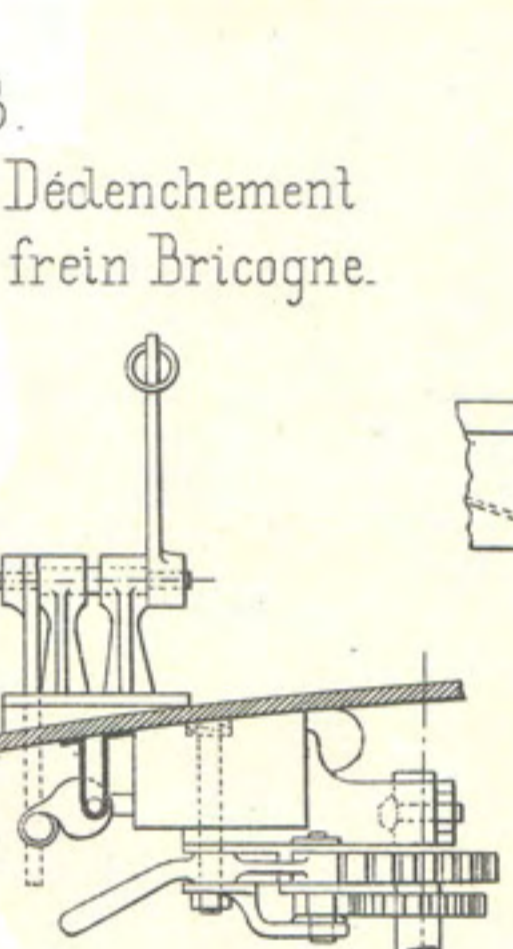
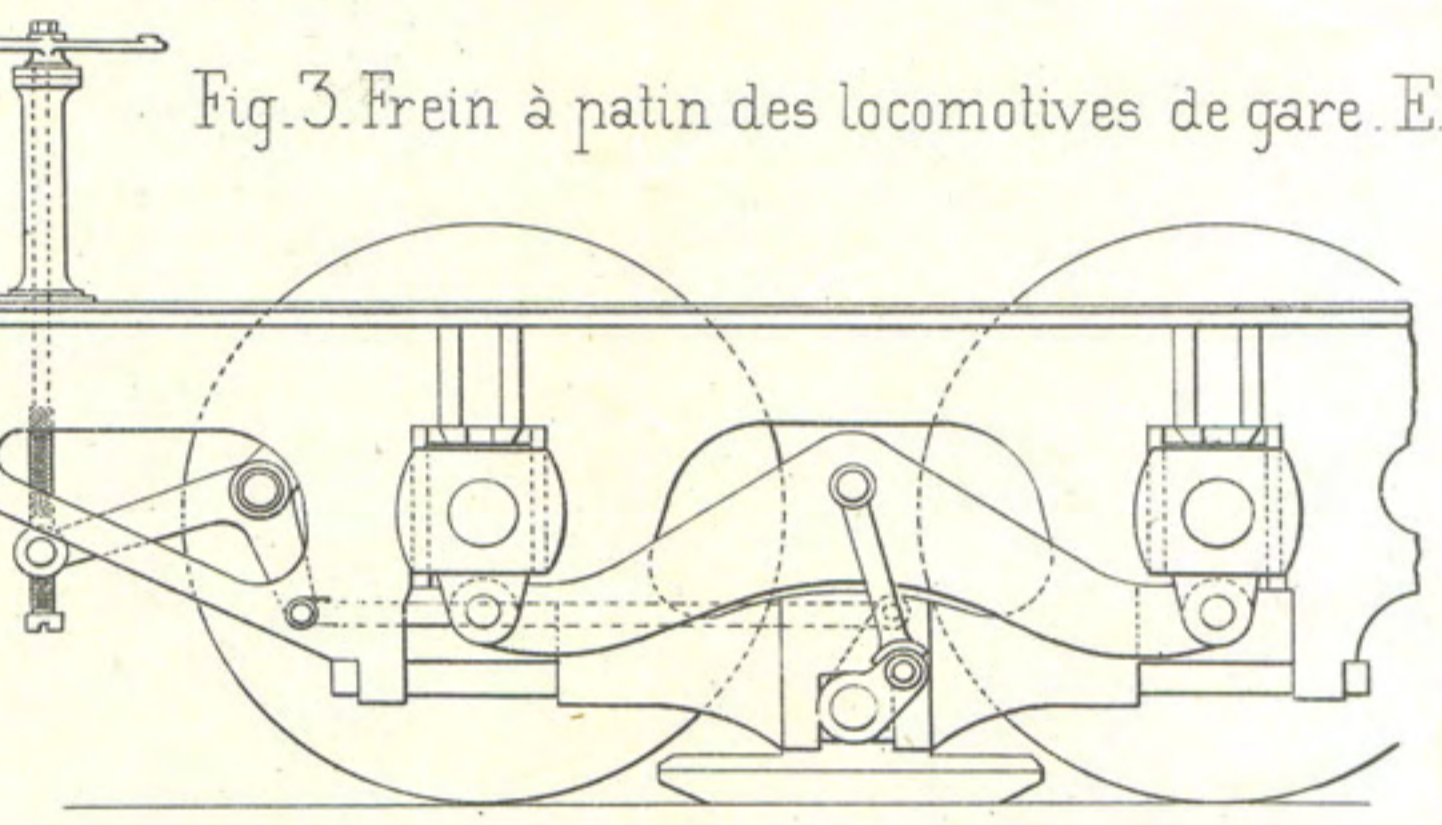
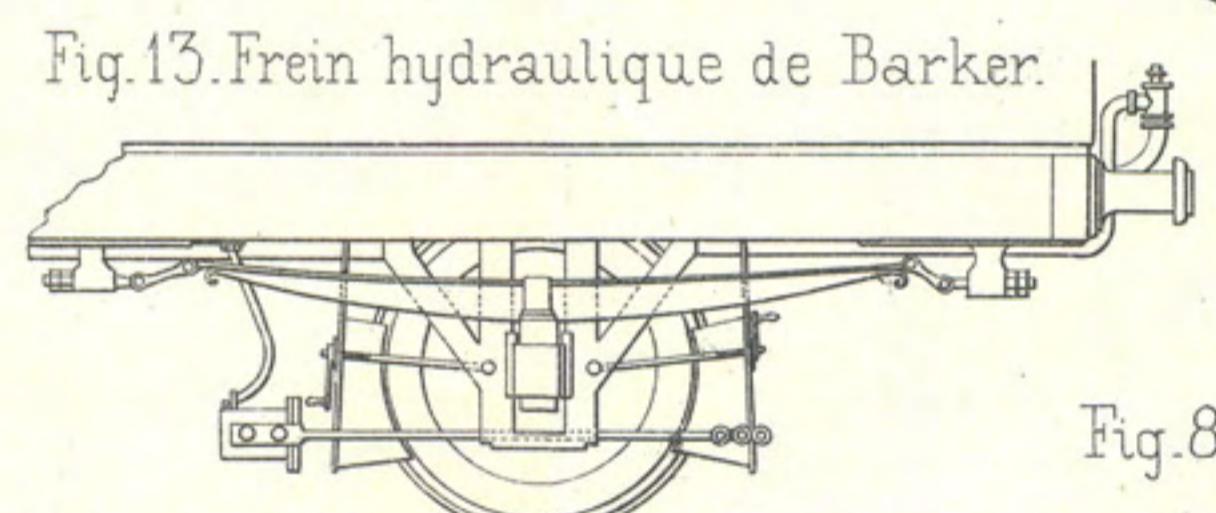
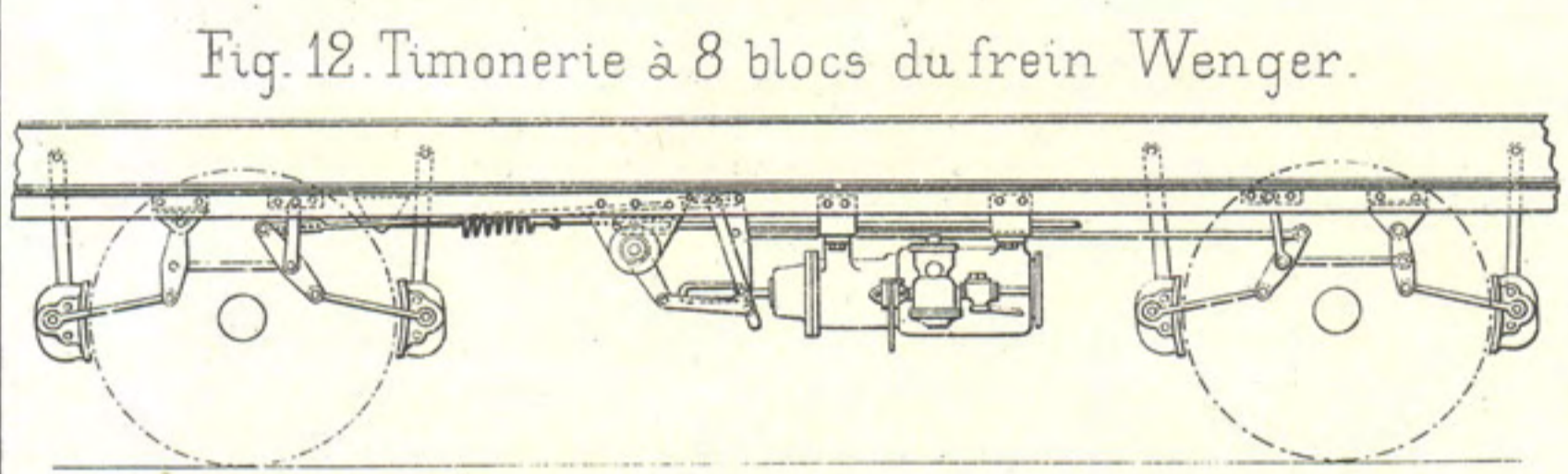
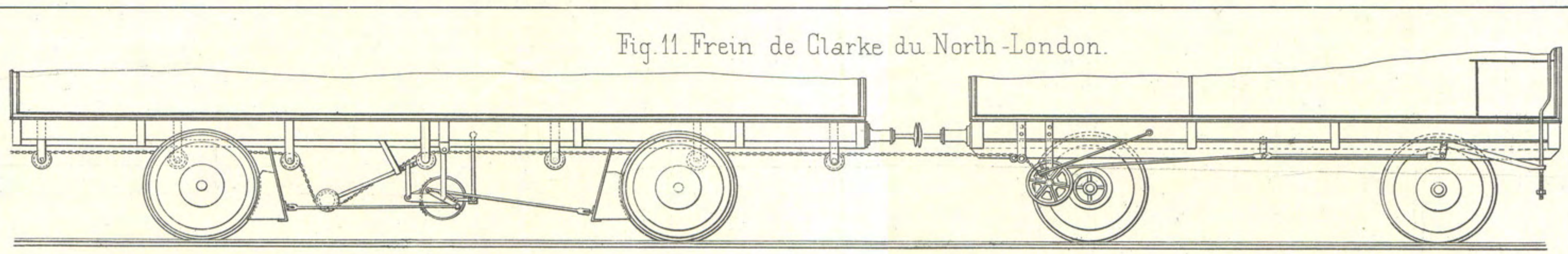
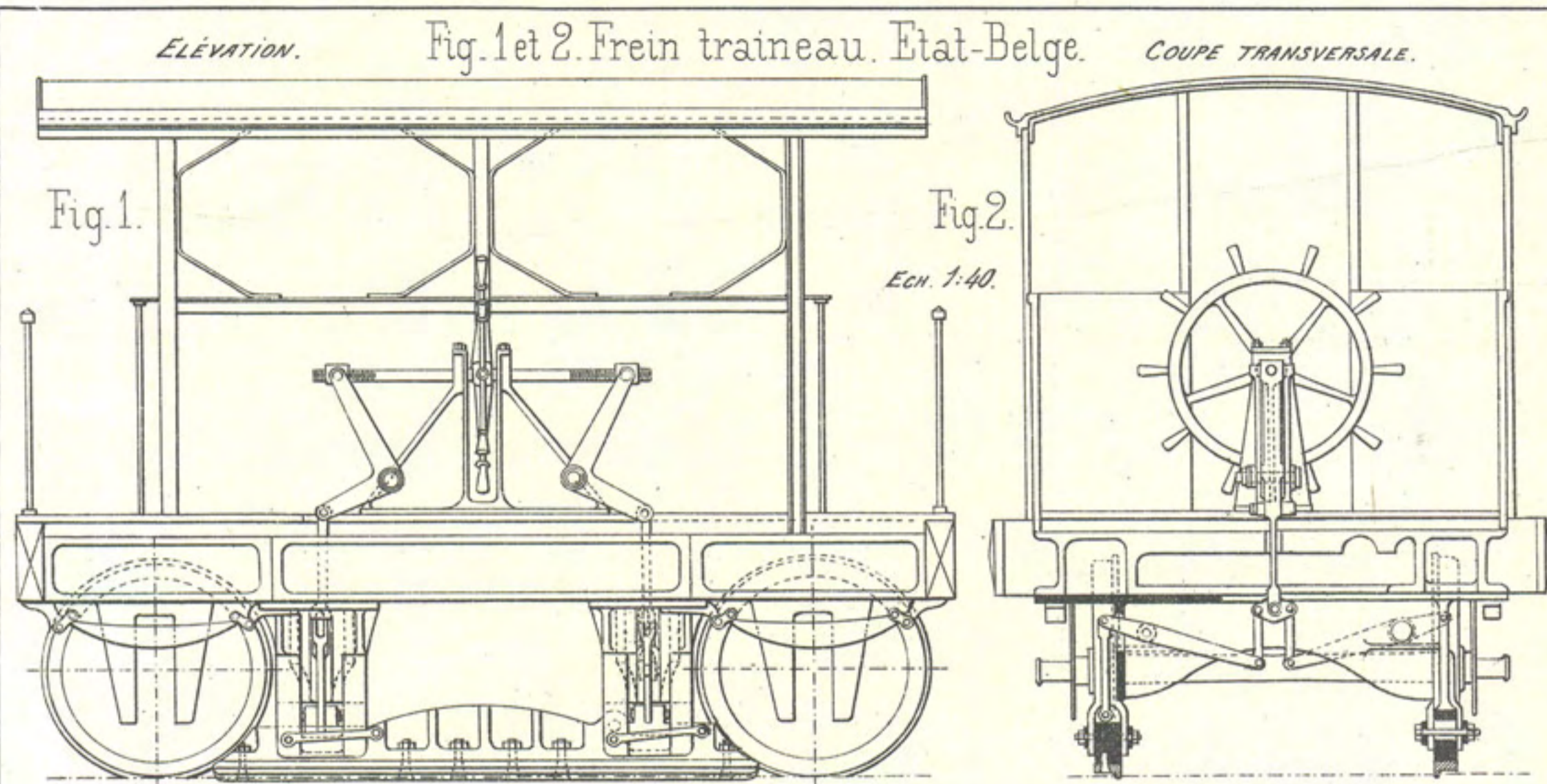


Fig.4. Dynamomètre.



## Expériences de Douglas-Galton sur les freins. (Diagrammes).







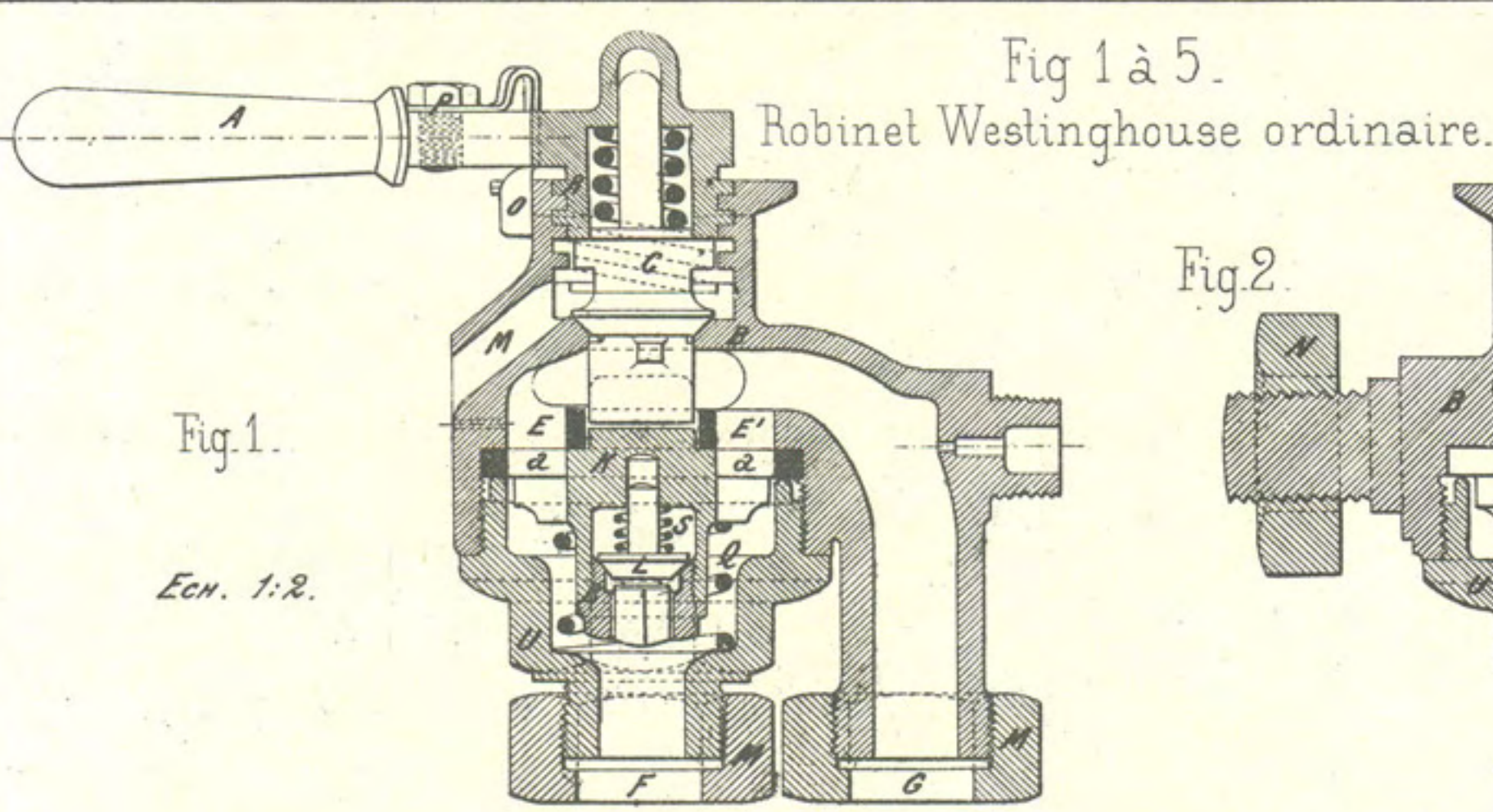


Fig. 1.

Ech. 1:2.

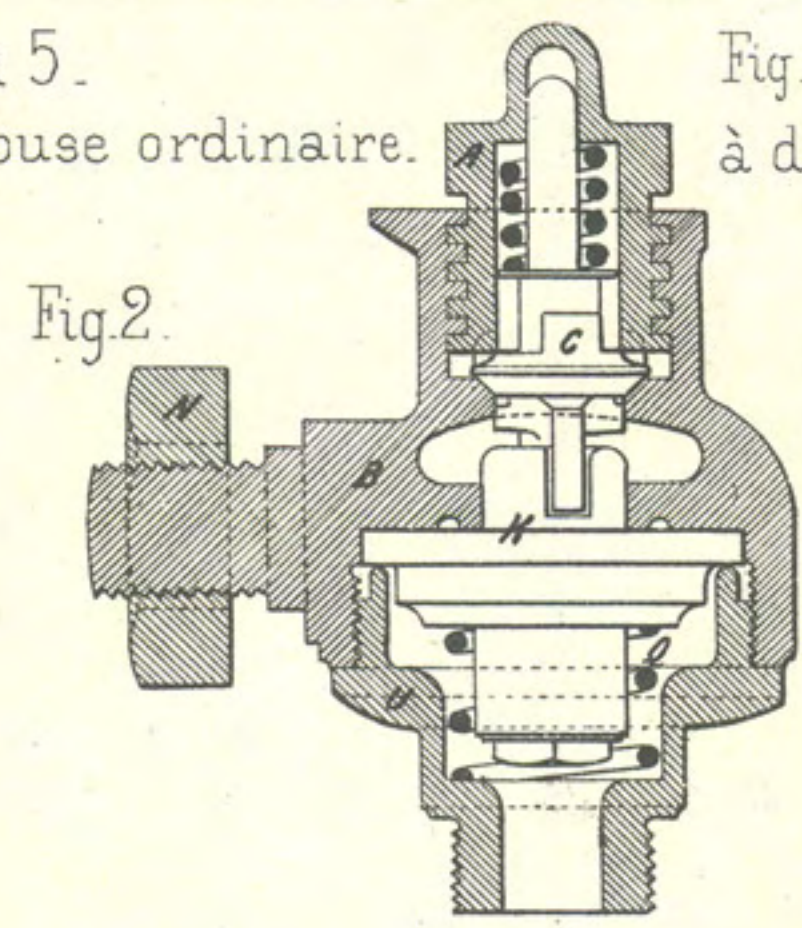


Fig. 2.

Fig. 11 à 14. Robinet Westinghouse à décharge égalisatrice.

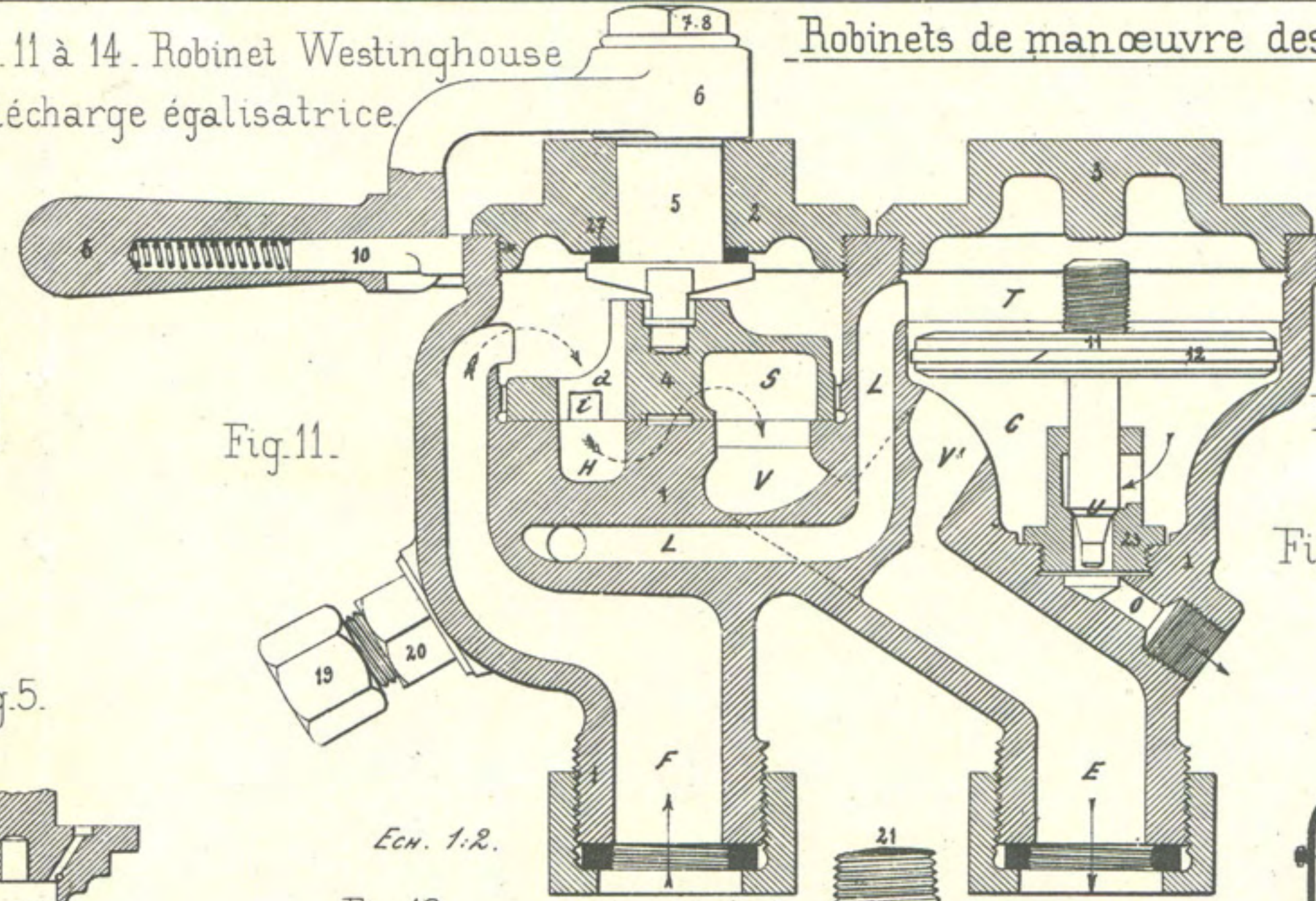


Fig. 11.

Ech. 1:2.

### Robinet de manoeuvre des freins à air comprimé.

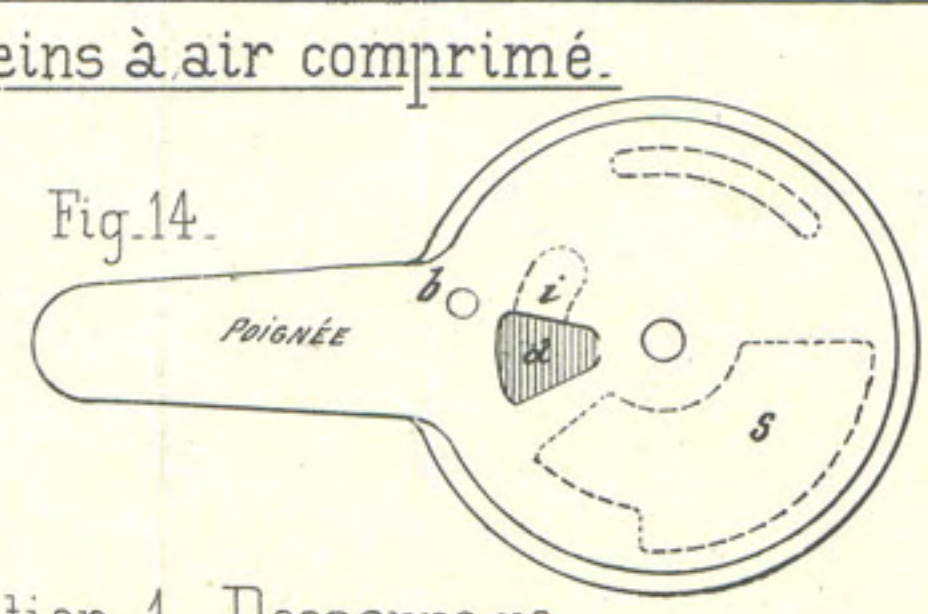
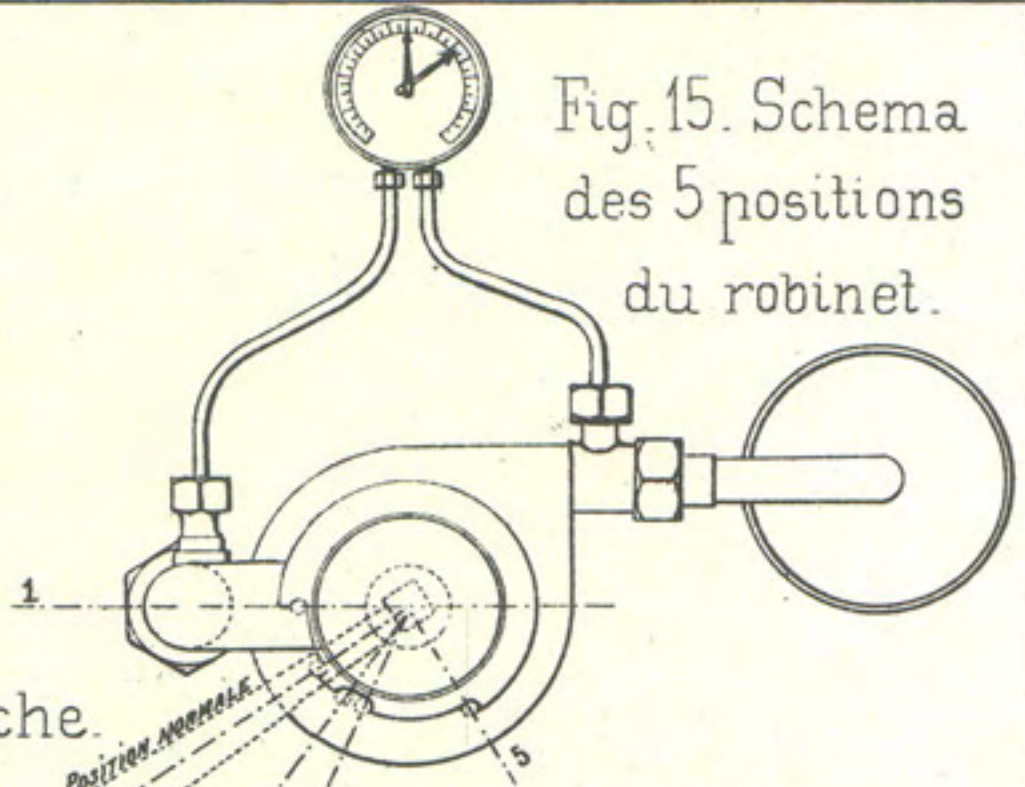


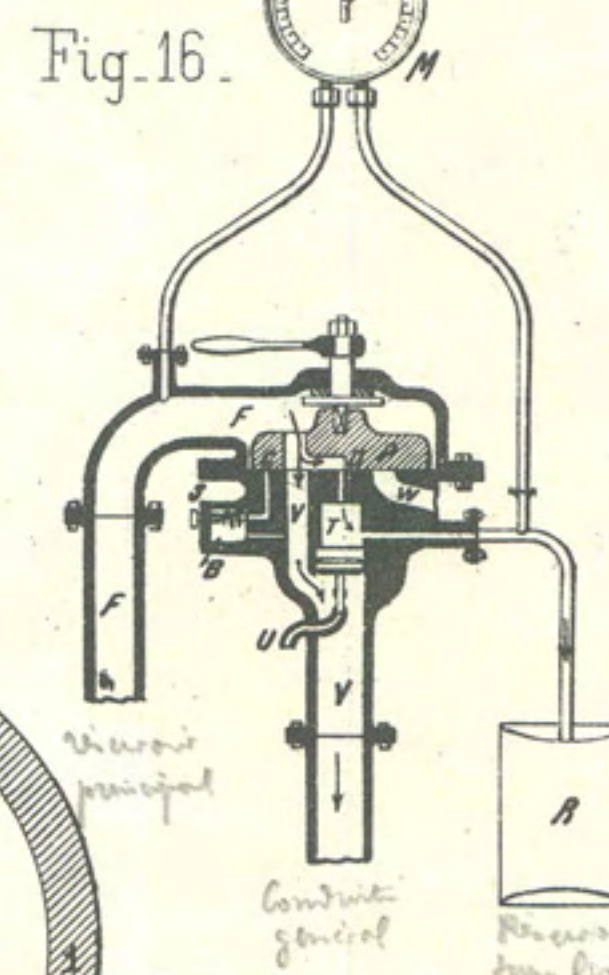
Fig. 14.

Position 1. Desserrage.

Position 2. Marche.



Position 3. Obturation de tous les conduits



Position 4. Serrage modéré.

Position 5. Serrage d'urgence.

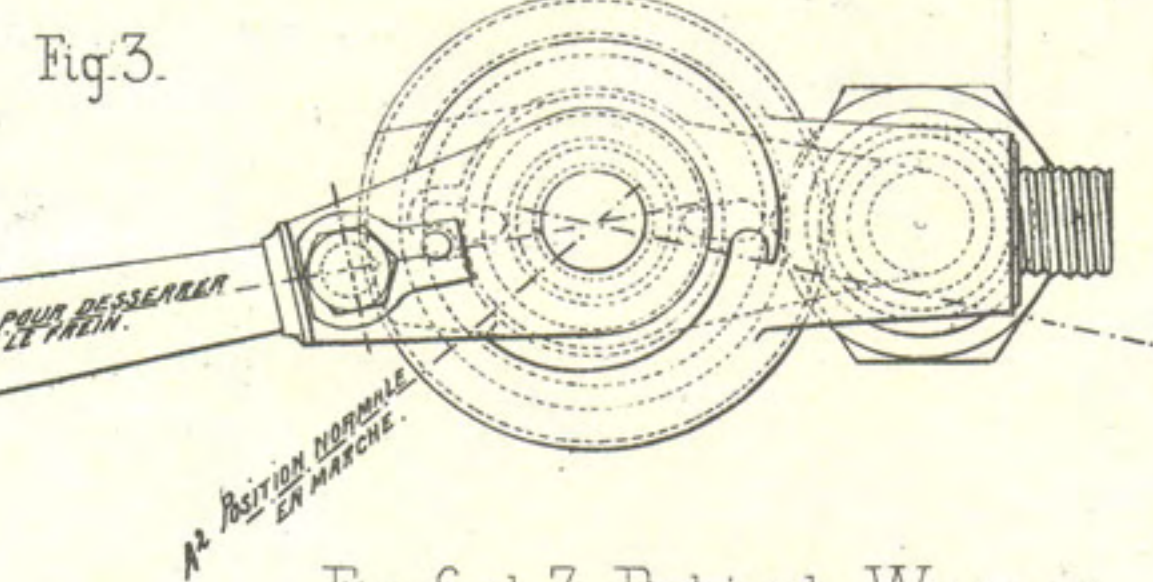
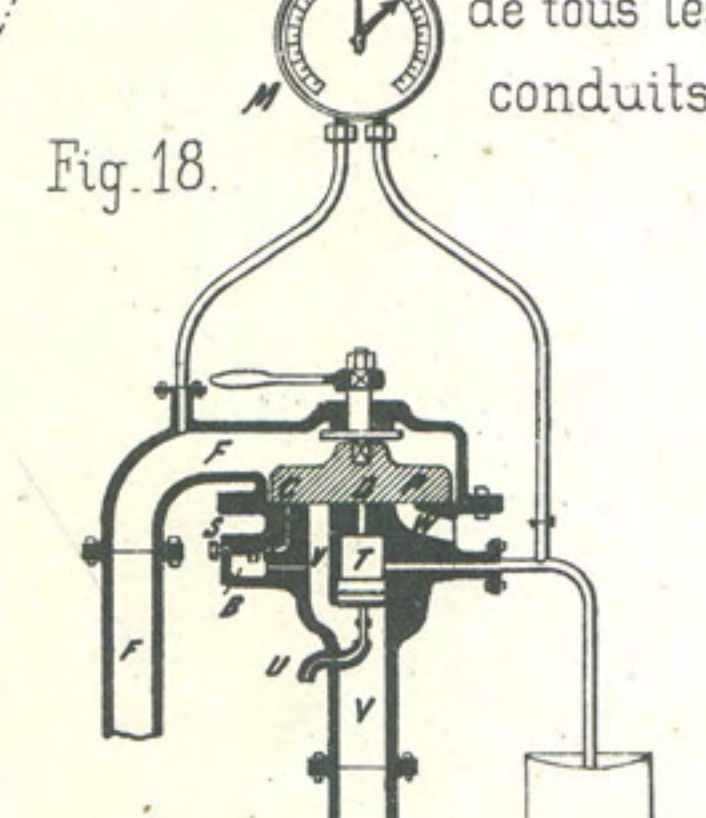
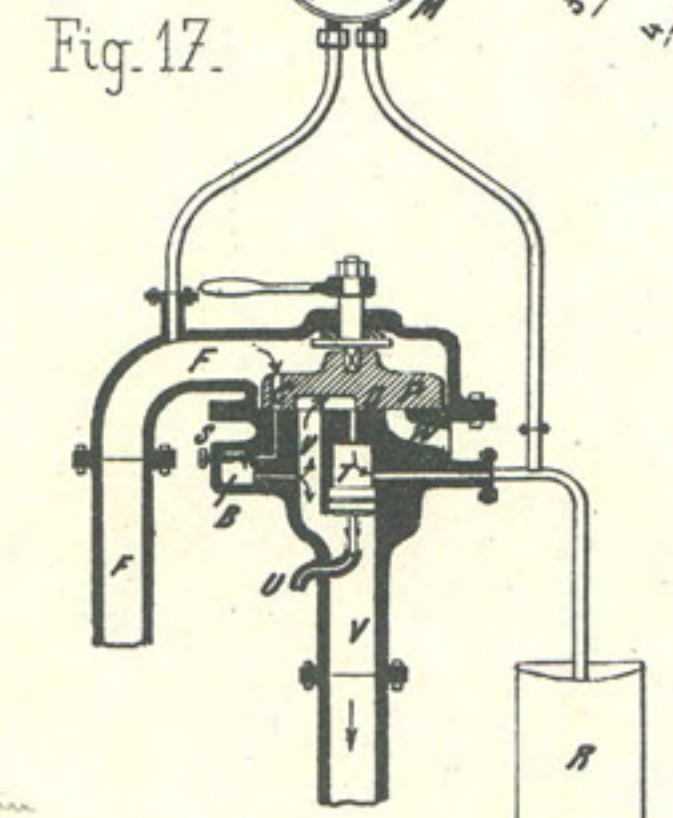


Fig. 3.

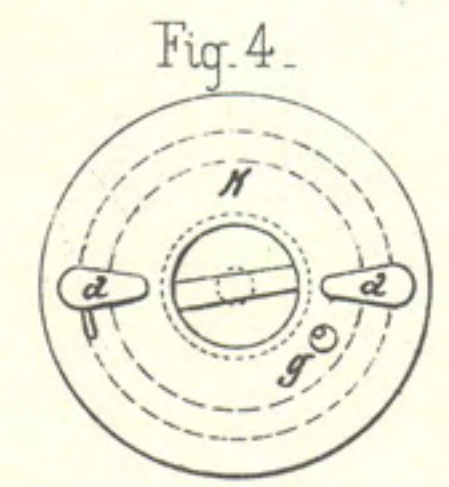


Fig. 4.

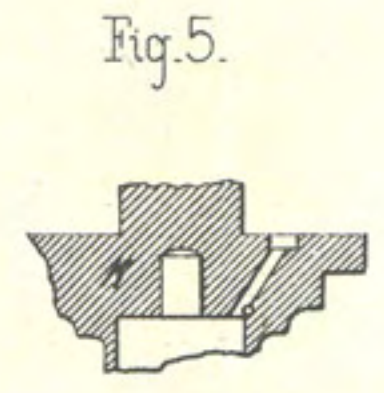


Fig. 5.

Fig. 8 à 10. Robinet Schleifer.

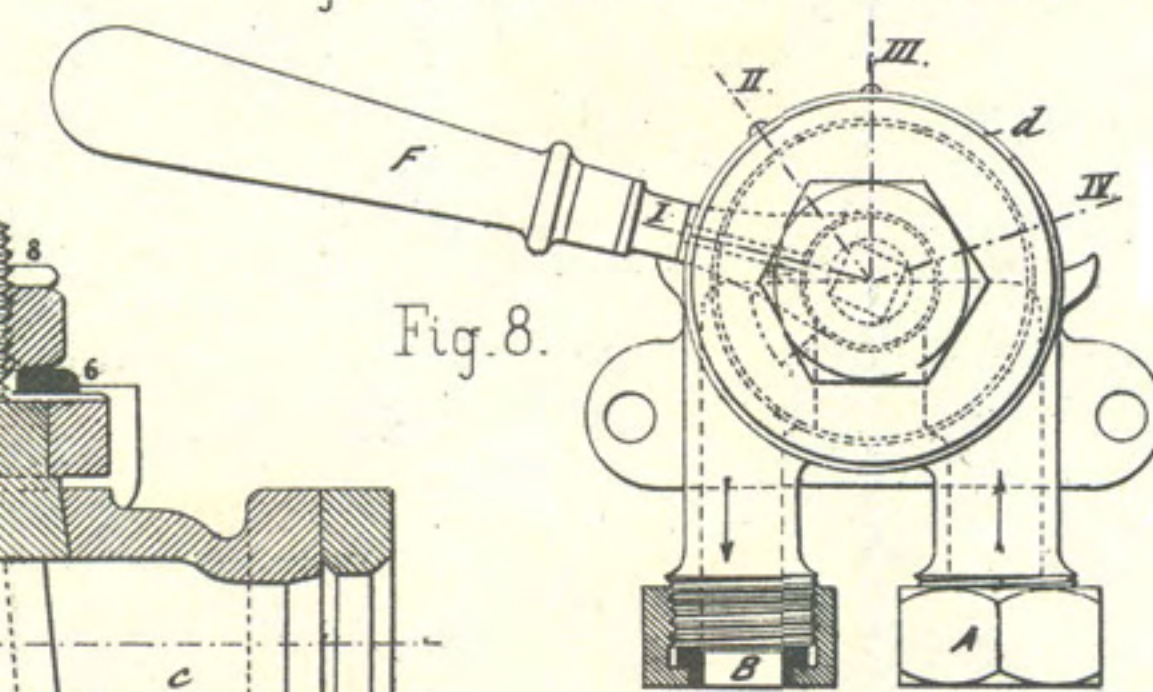


Fig. 8.

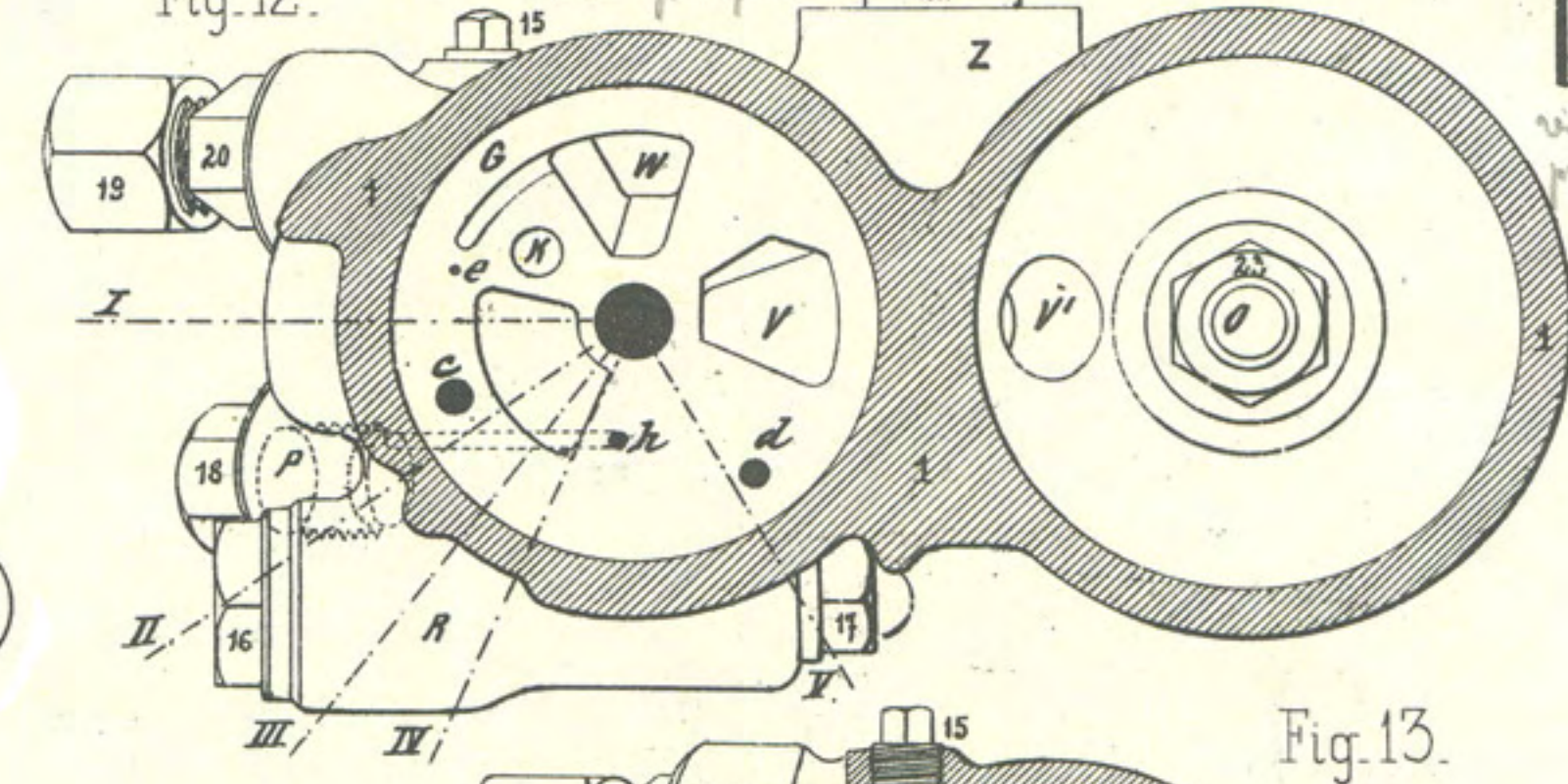


Fig. 12.

Ech. 1:3.

Fig. 6 et 7. Robinet Wenger.

Fig. 6.

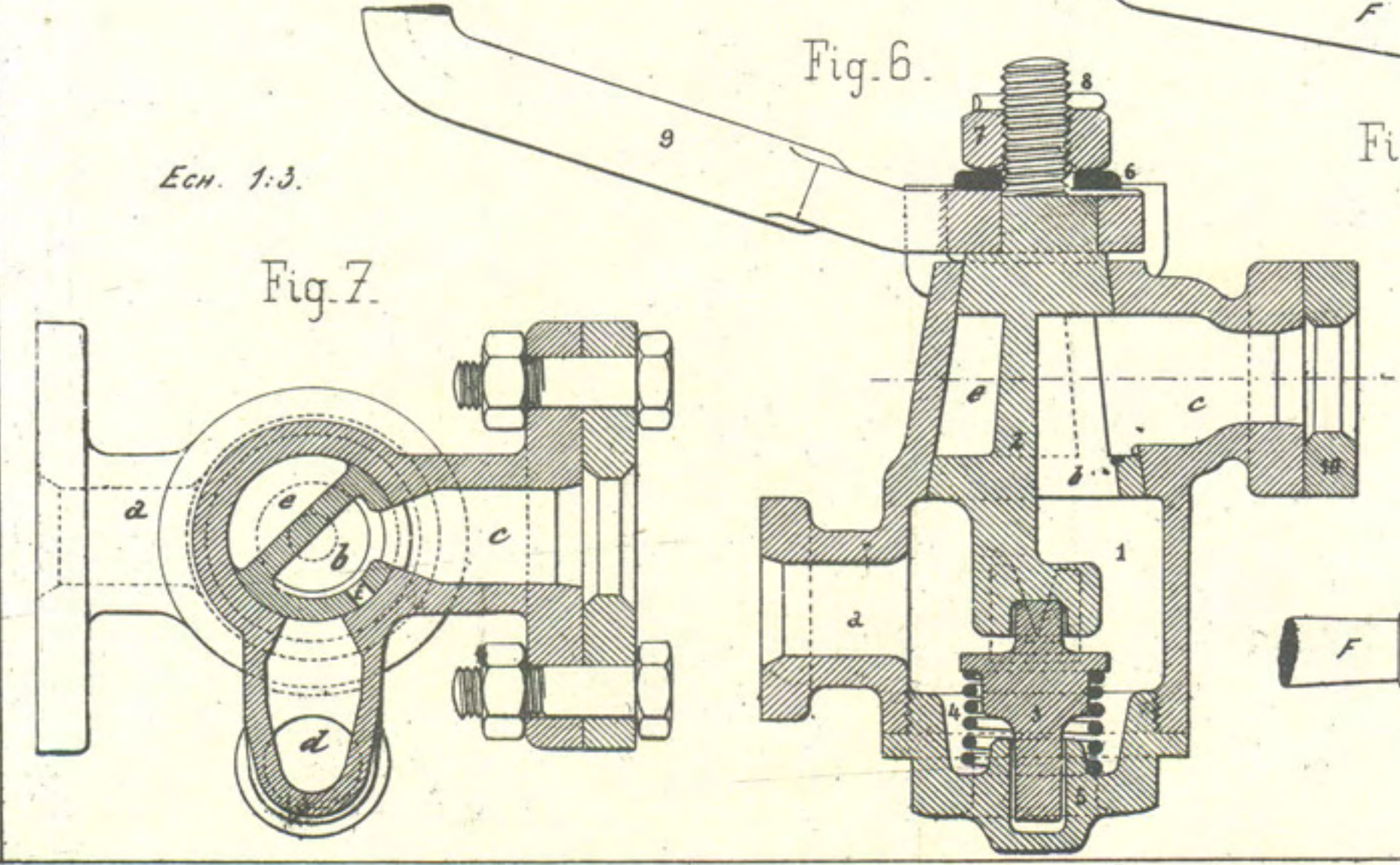


Fig. 7.

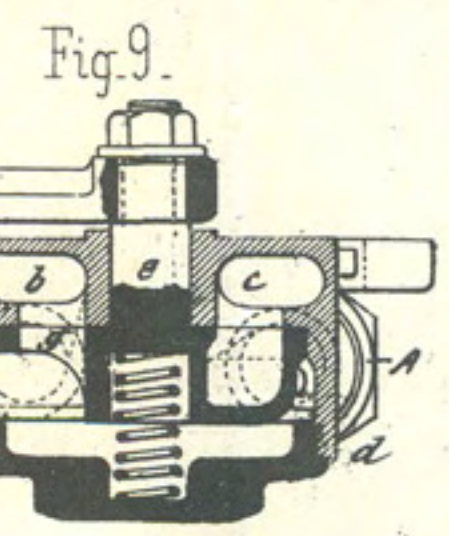


Fig. 9.

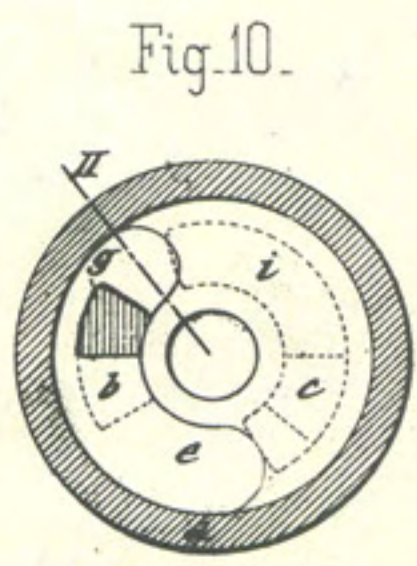


Fig. 10.

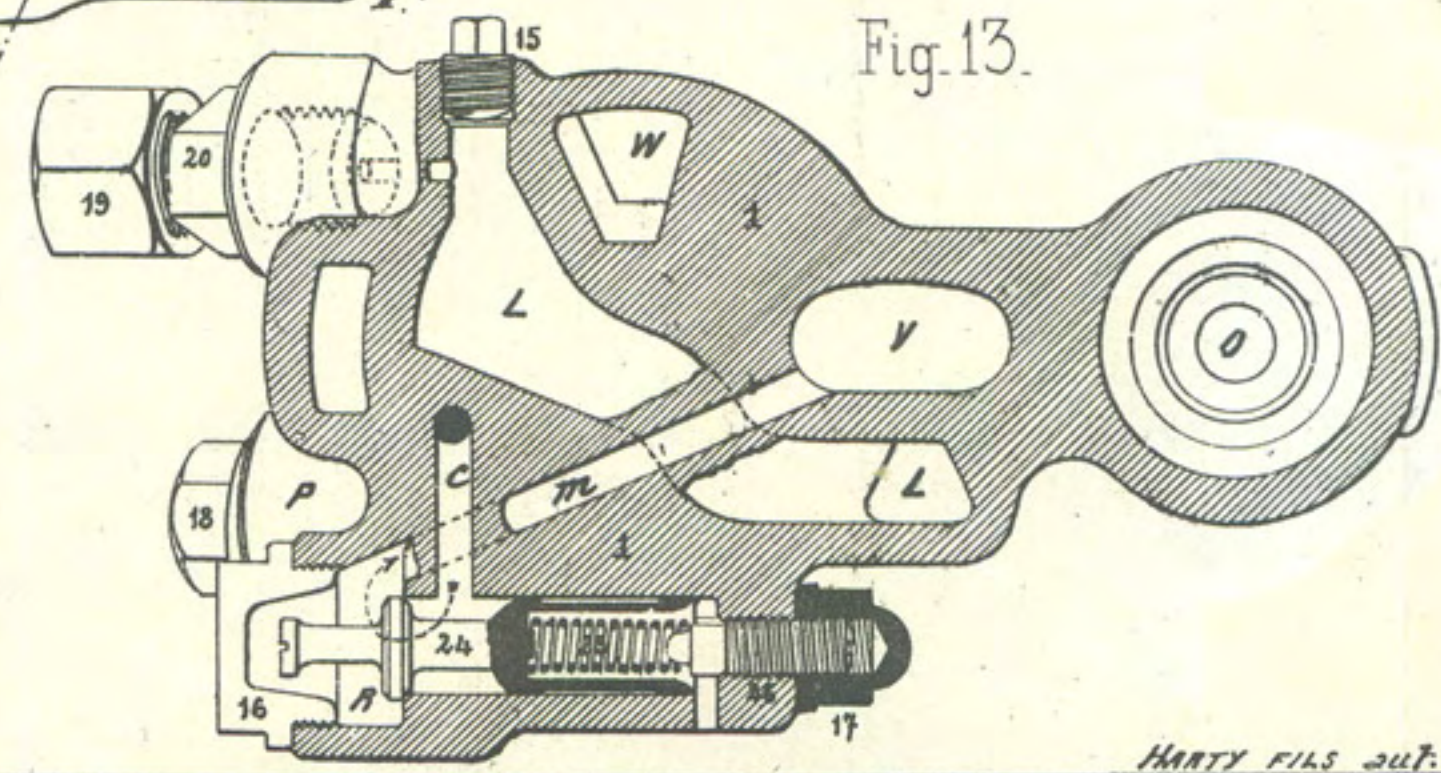


Fig. 13.

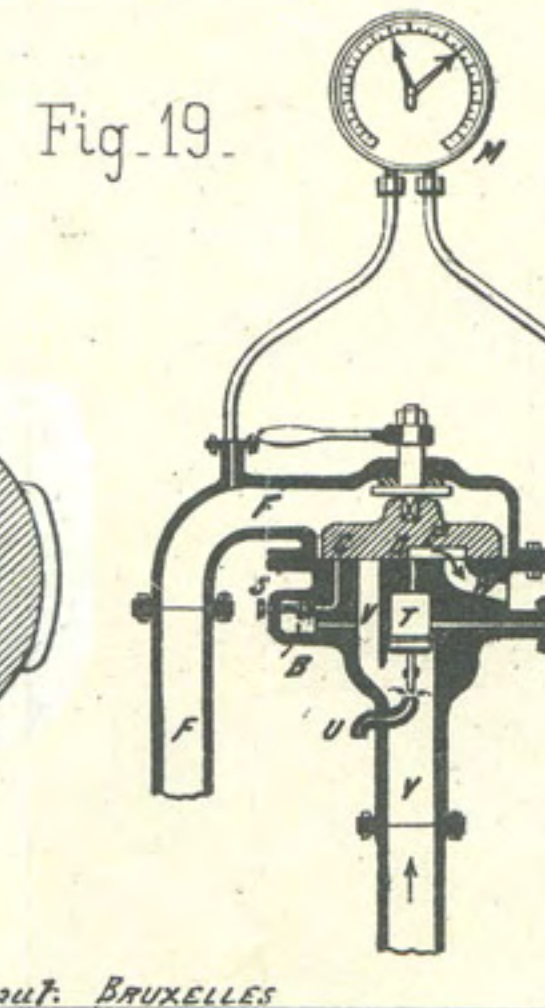


Fig. 19.

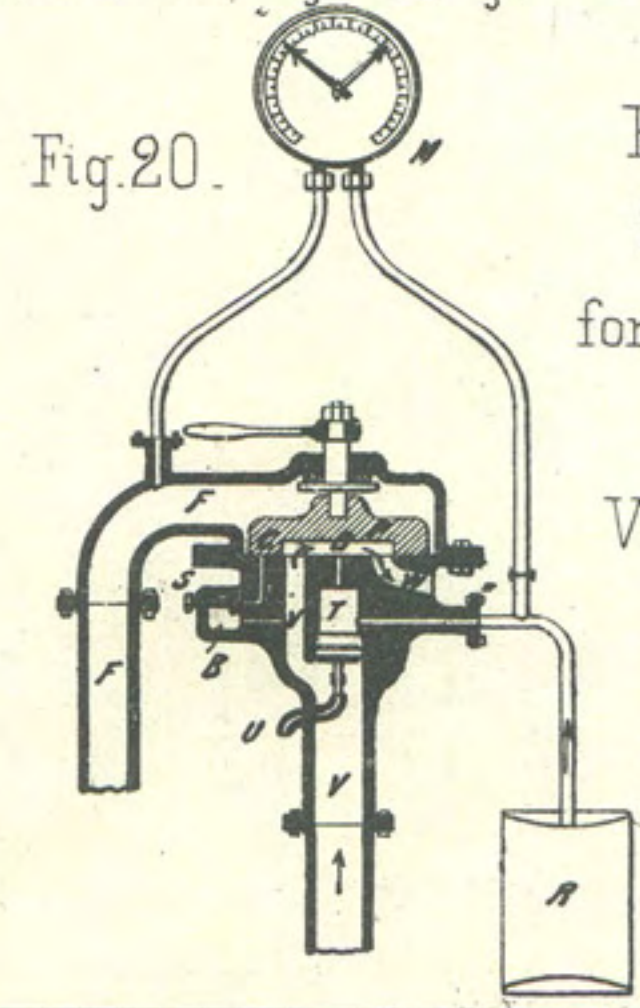


Fig. 20.

Fig. 15 à 20. Schema du fonctionnement du robinet Westinghouse à décharge égalisatrice.

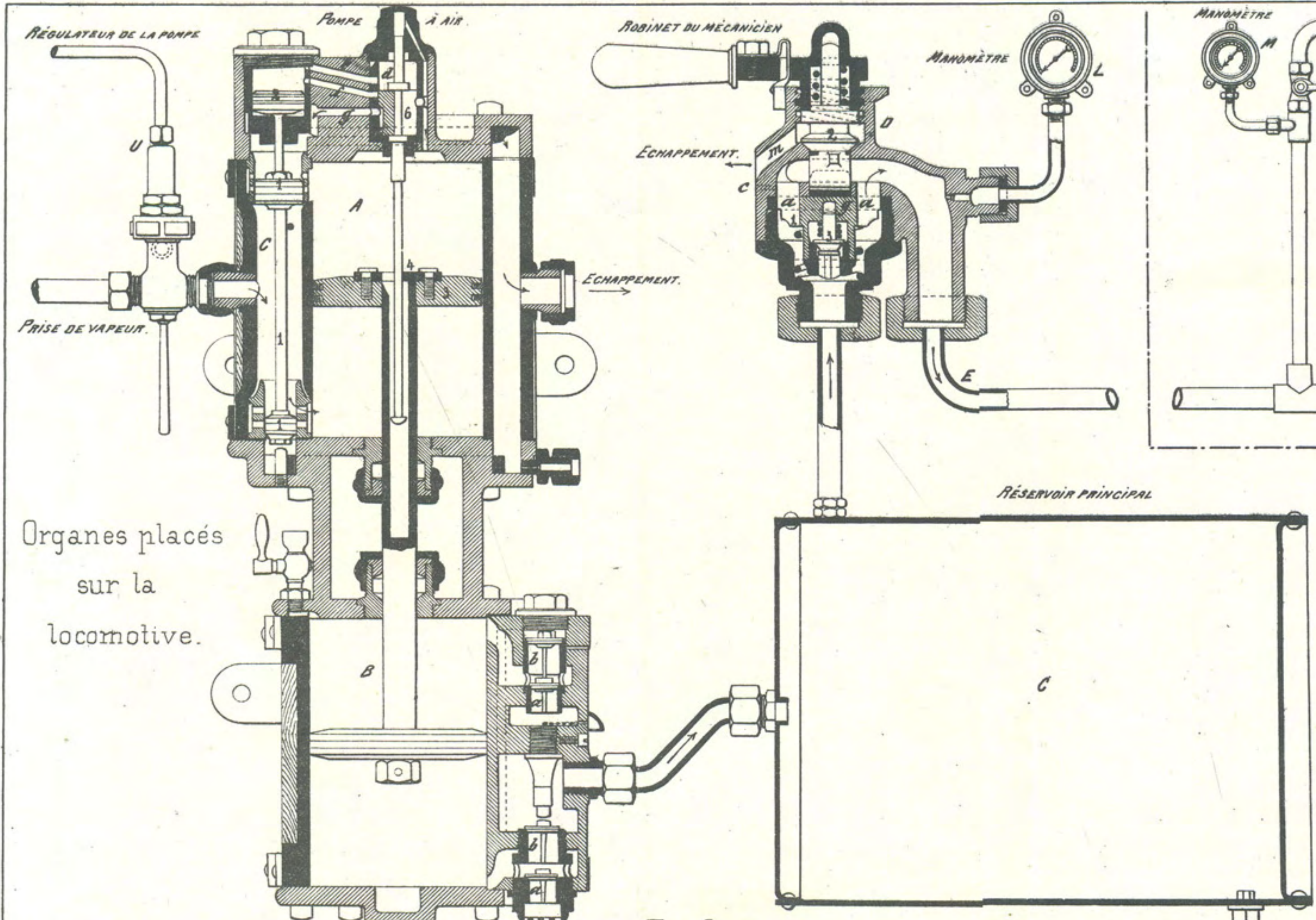


Fig. 2.

Organes placés sur la locomotive.

Disposition d'ensemble du frein Westinghouse à action rapide.

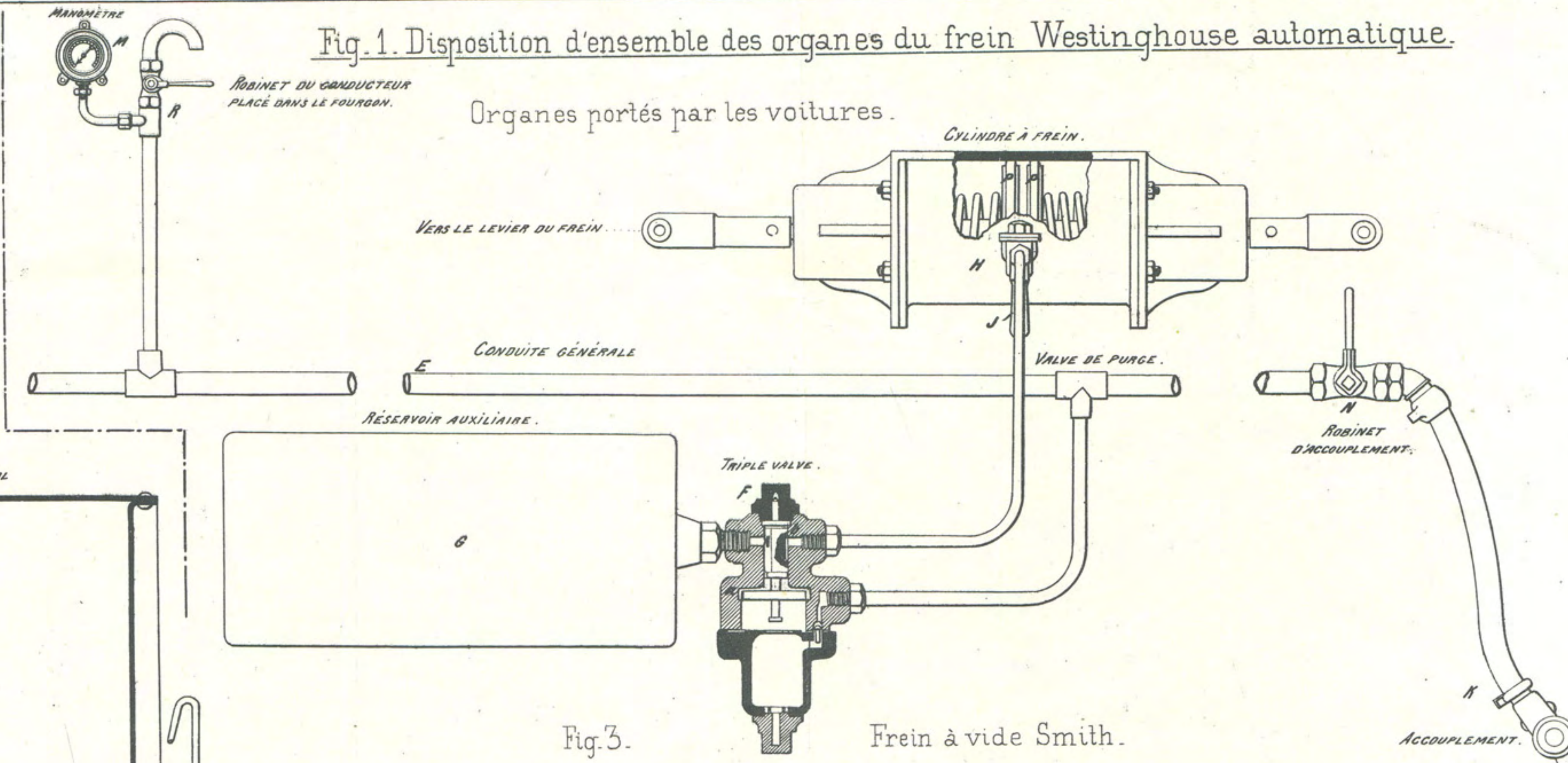


Fig. 3.

Frein à vide Smith.

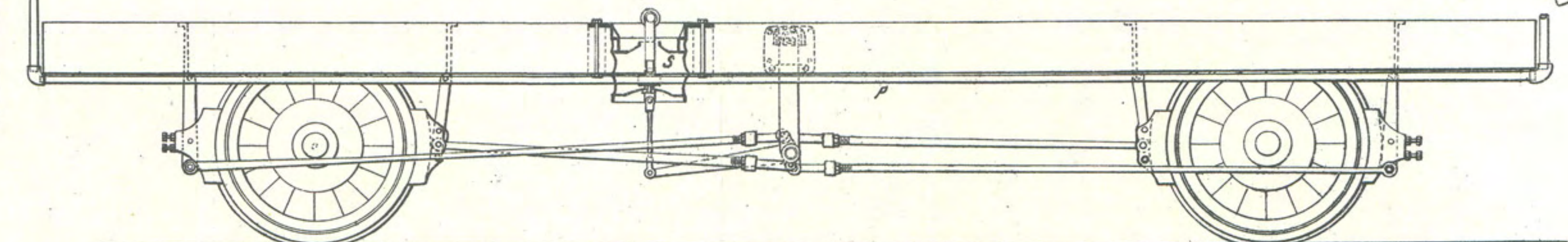


Fig. 4. Frein à vide Hardy.

Fig. 1. Disposition d'ensemble des organes du frein Westinghouse automatique.

Organes portés par les voitures.

Fig. 1 à 6. Robinet de Schleifer Triple valve ordinaire de Westinghouse. Distributeur Soulerin. Distributeur Westinghouse à action rapide. Disposition d'ensemble du frein Henry du P.L.M.

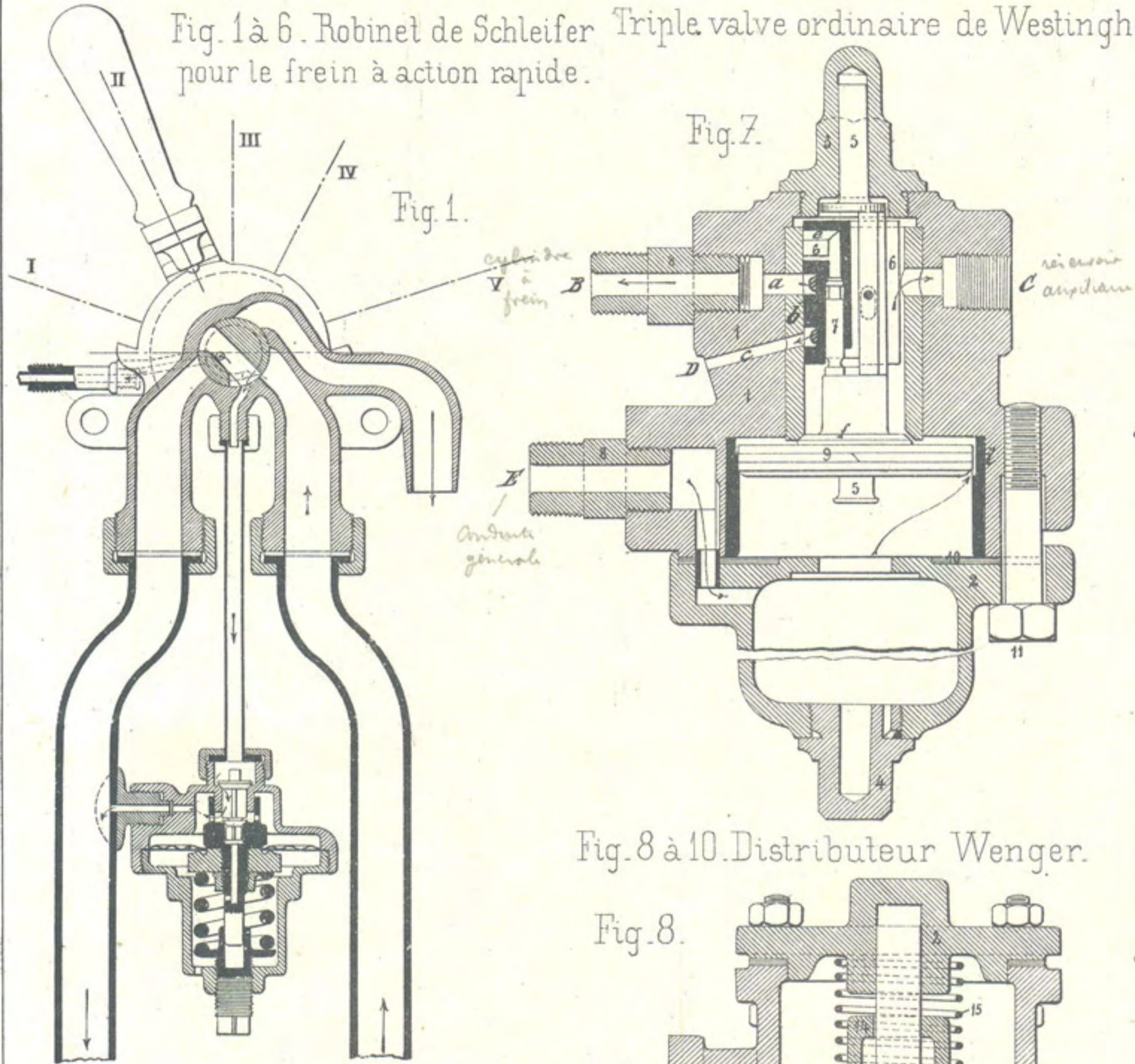


Fig. 1.

Fig. 7.

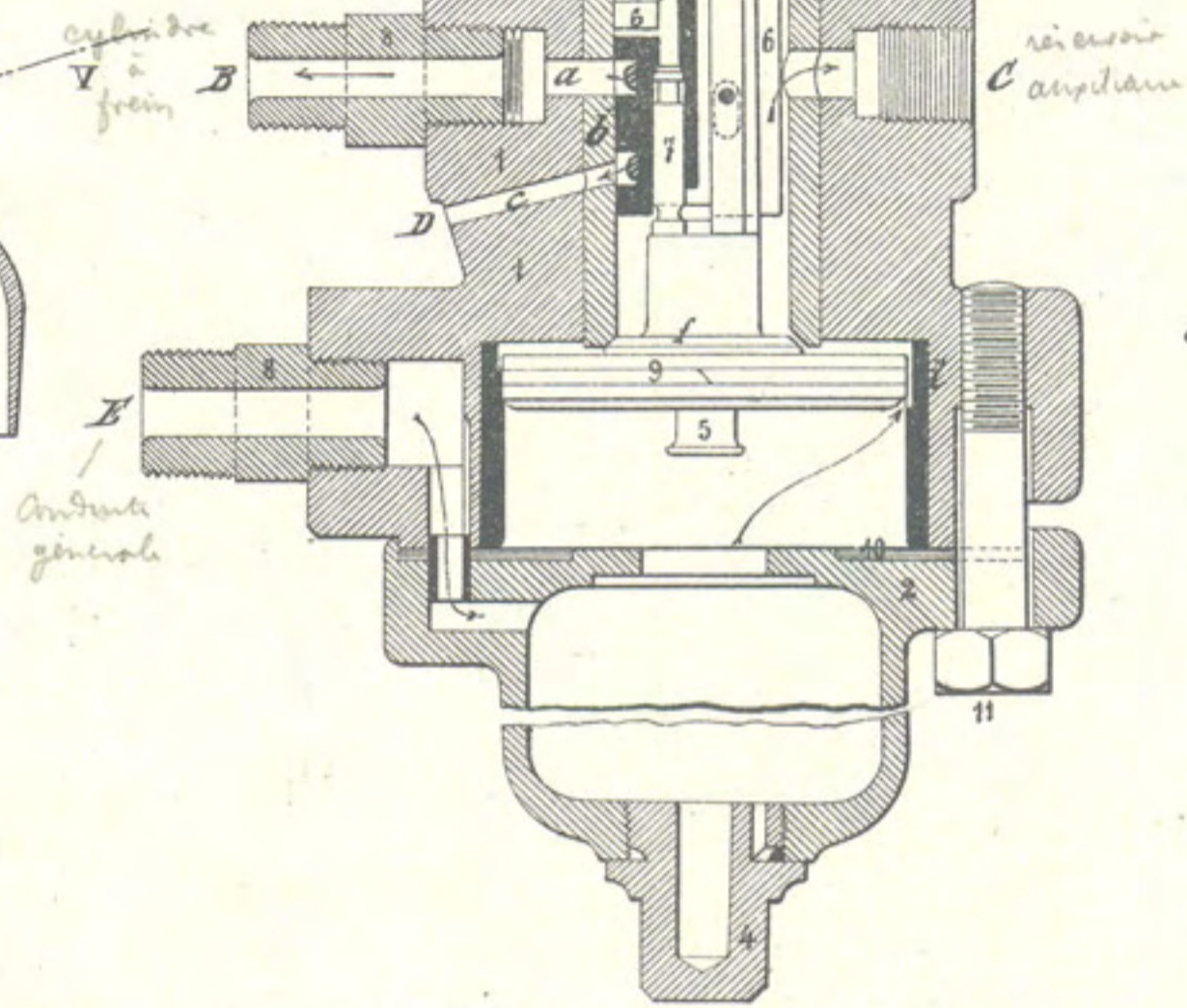


Fig. 8 à 10. Distributeur Wenger.

Fig. 8.

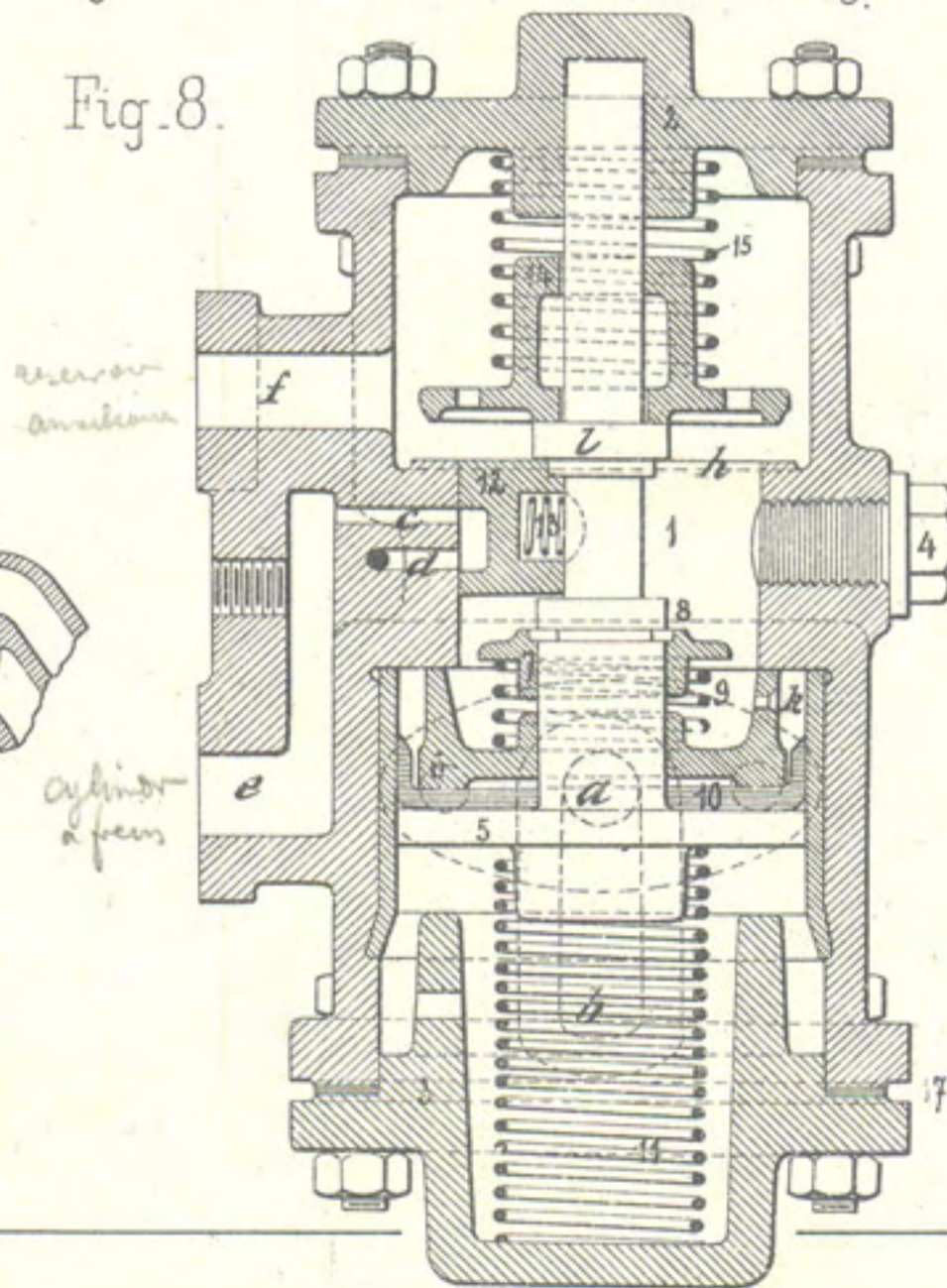


Fig. 2.

Fig. 3.

Fig. 4.

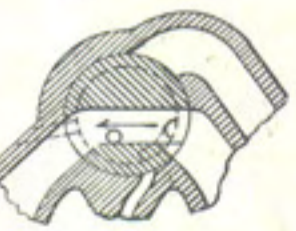


Fig. 5.

Fig. 6.

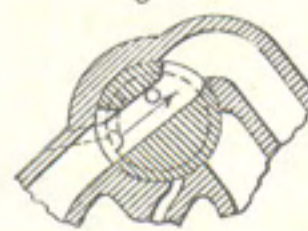
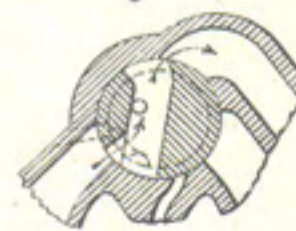


Fig. 11.

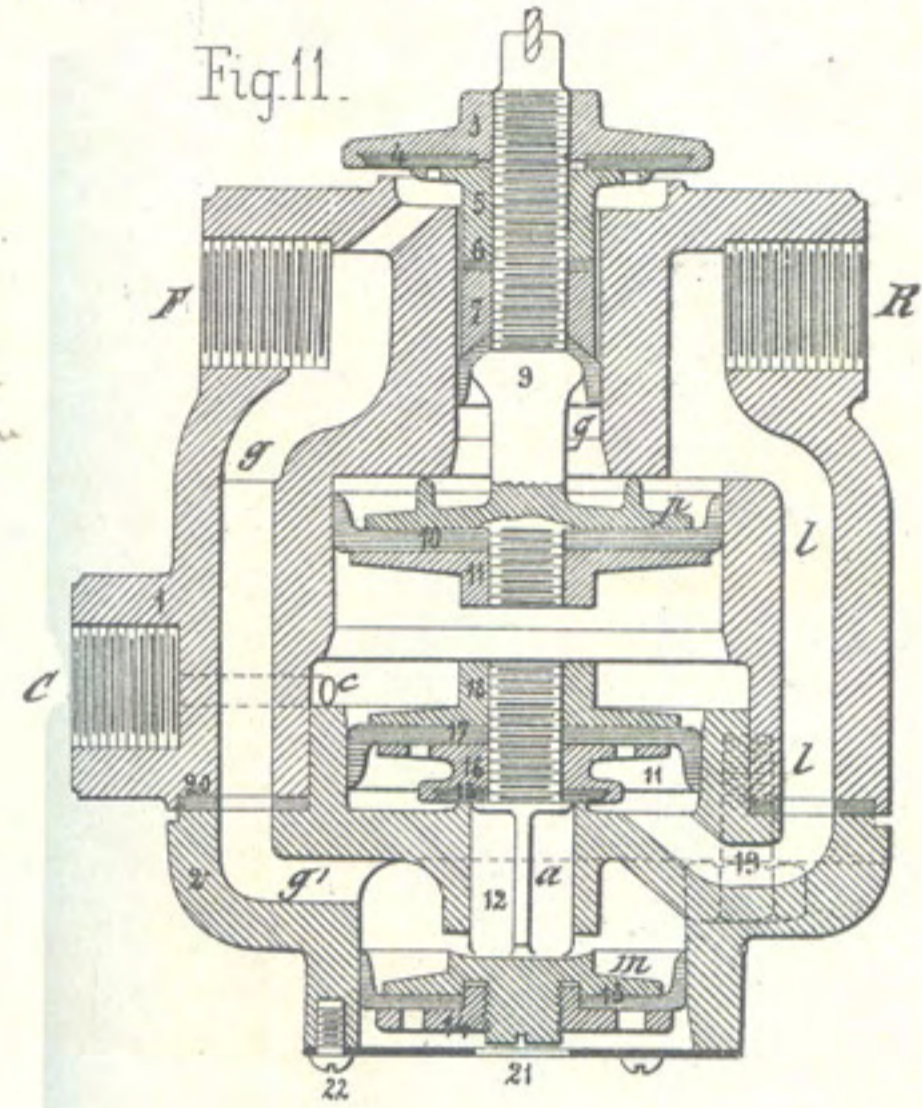


Fig. 9.

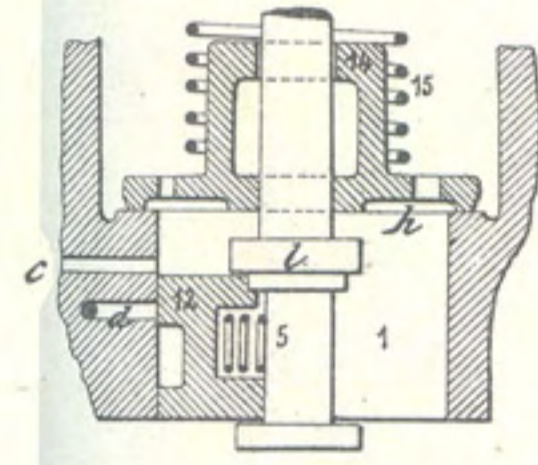
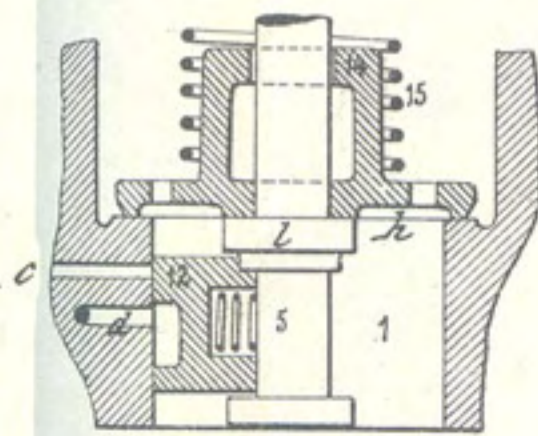


Fig. 10.



Distributeur Westinghouse à action rapide.

Fig. 12.

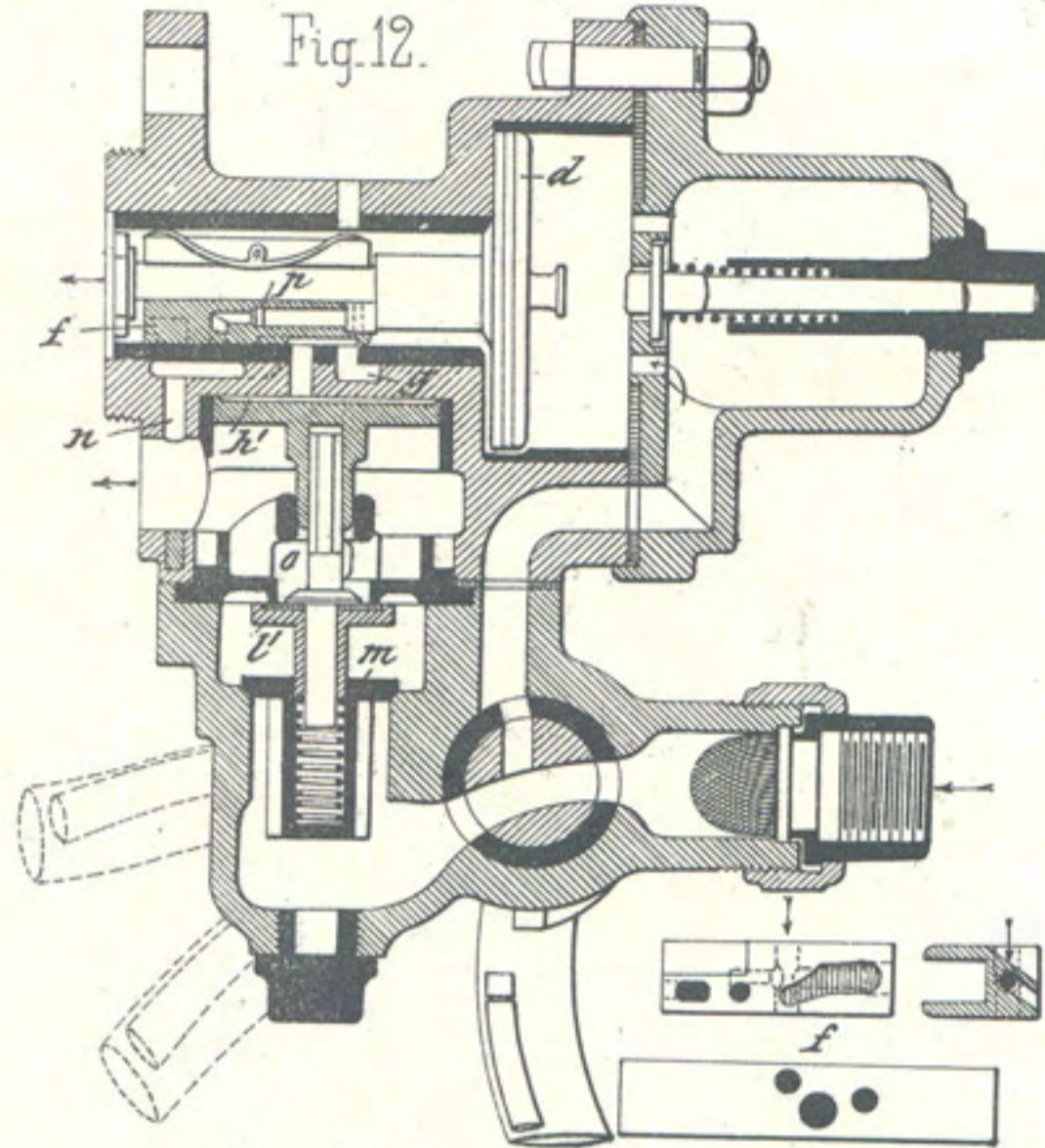


Fig. 13.

Distributeur Schleifer à action rapide.

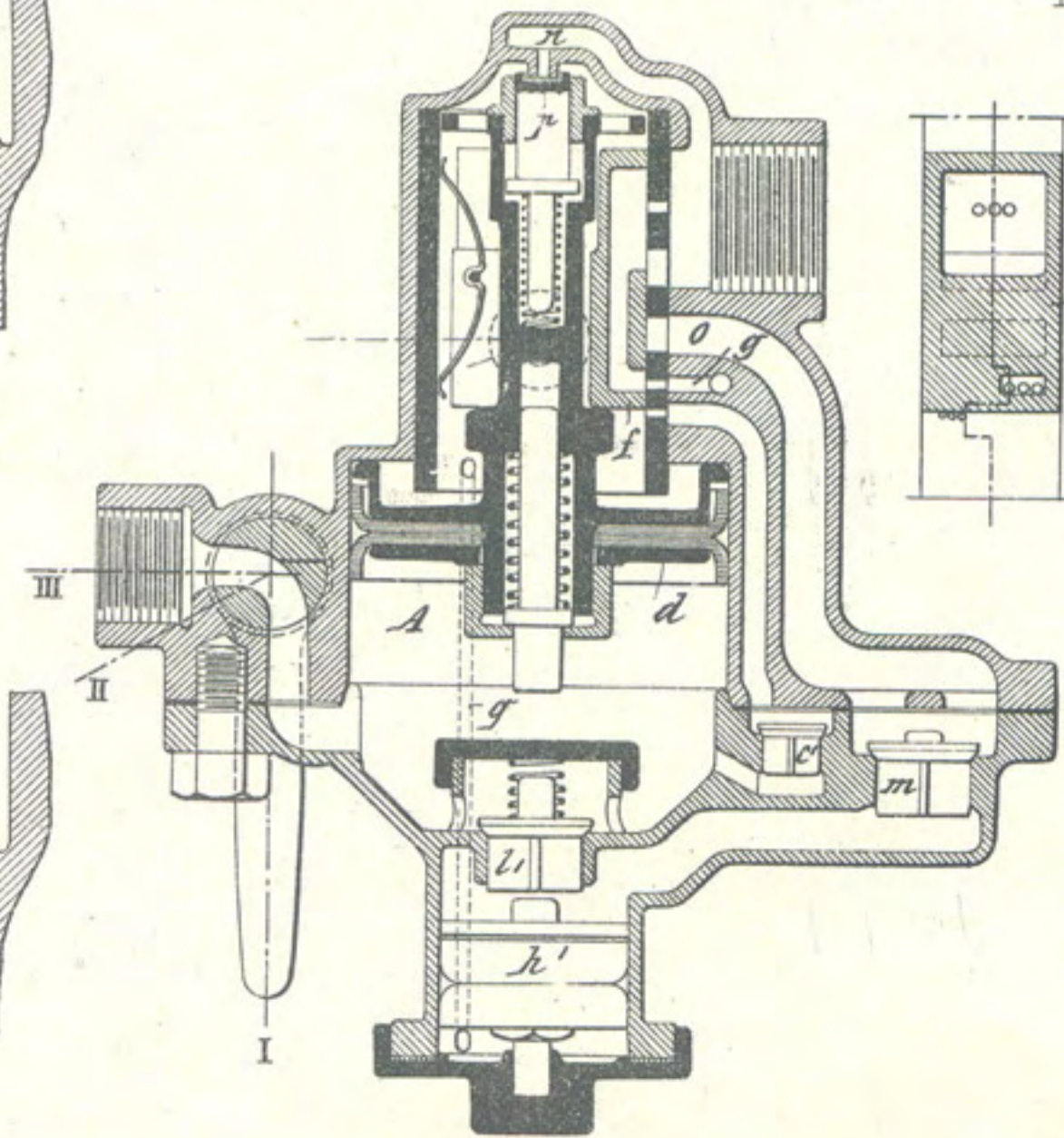


Fig. 18 et 19. Frein hydraulique de Woods.

Fig. 18. Distributeur.

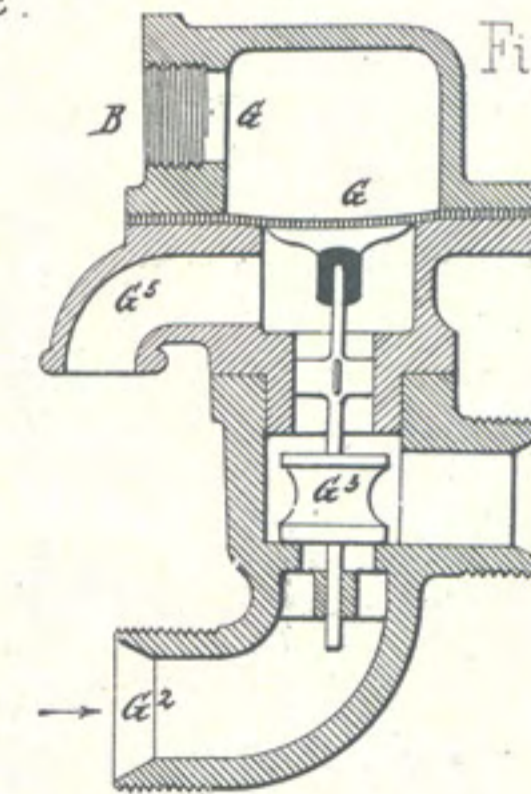
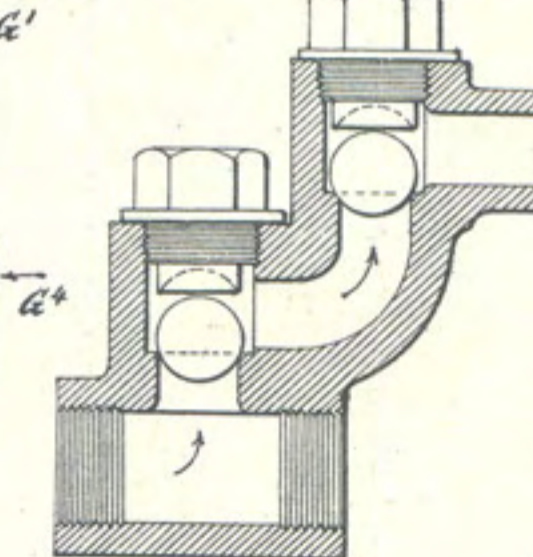


Fig. 19. Double valve d'arrêt.



Cylindre à frein à simple piston Westinghouse.

Fig. 16.

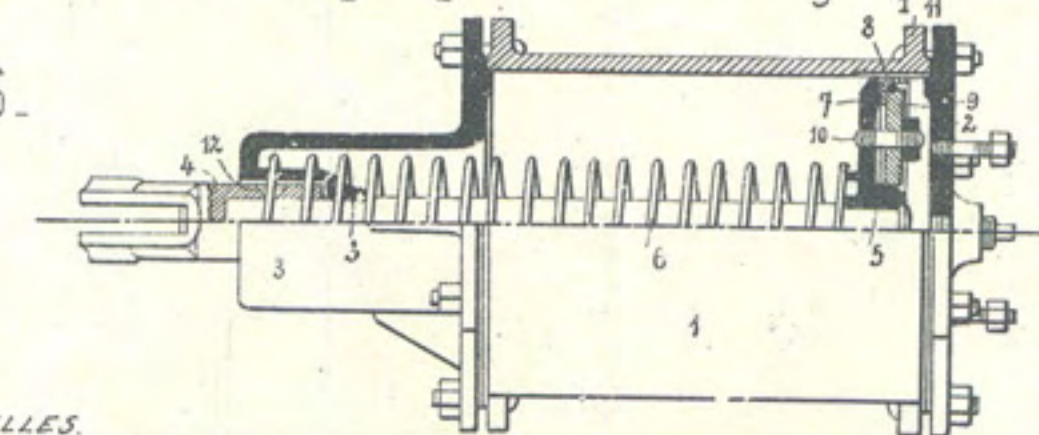


Fig. 15. Cylindre à frein à double piston Westinghouse.

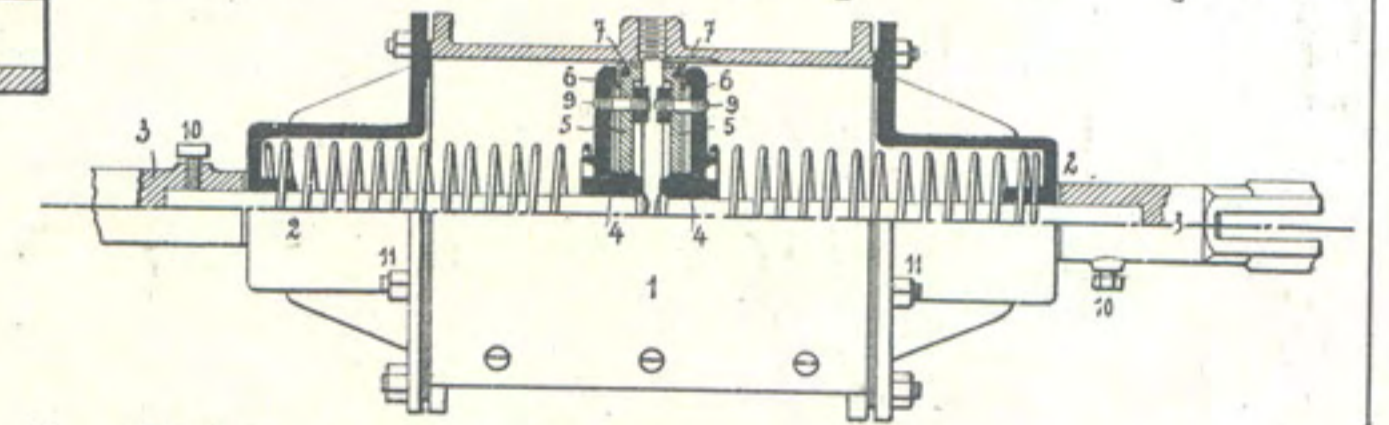


Fig. 17. Cylindre à frein avec réservoir dépendant Wenger.

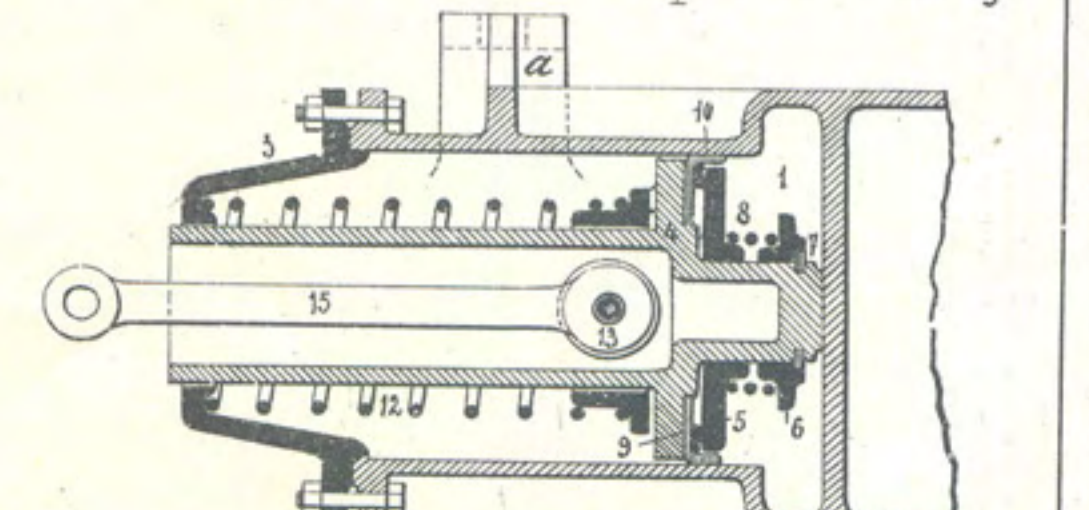


Fig. 14.

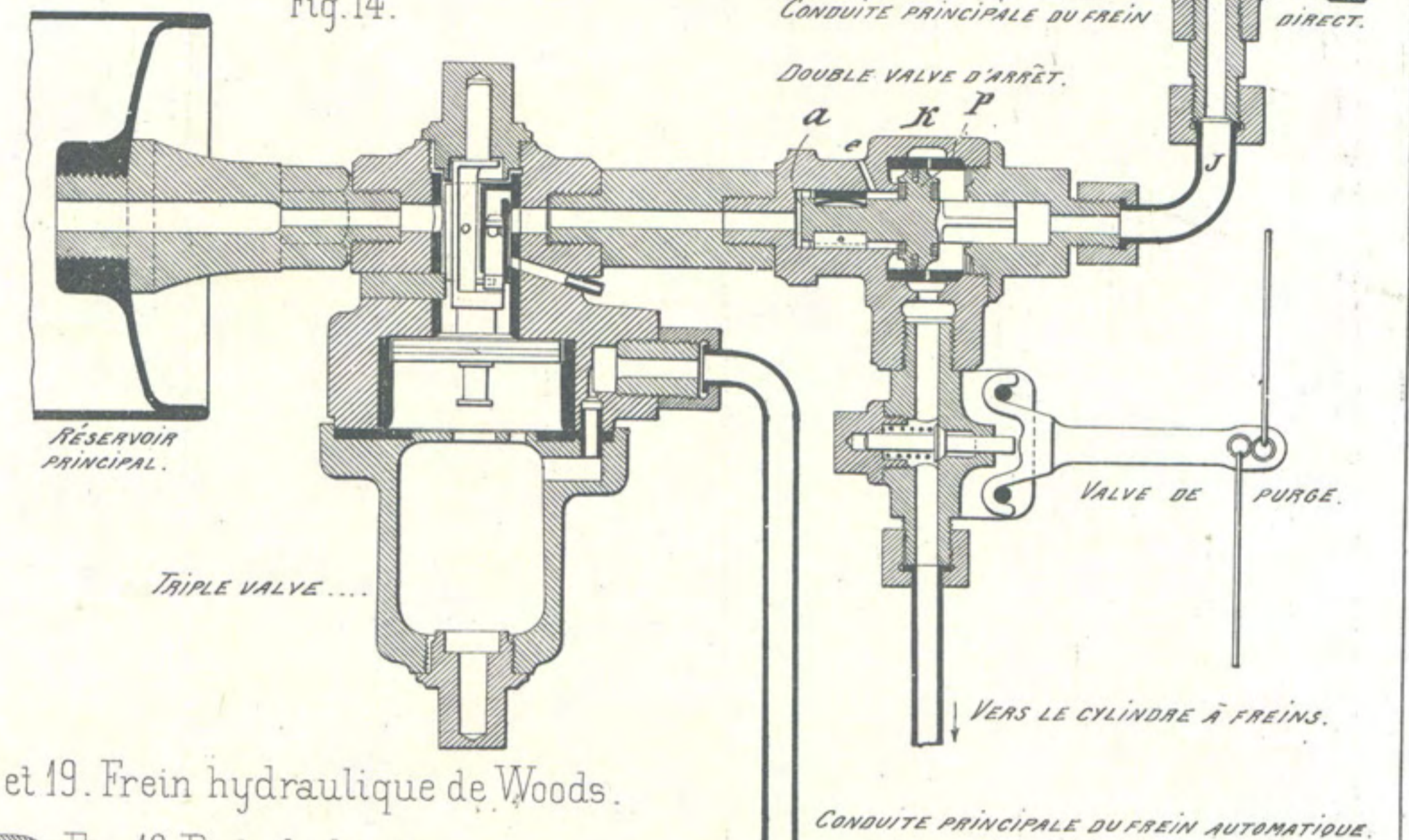
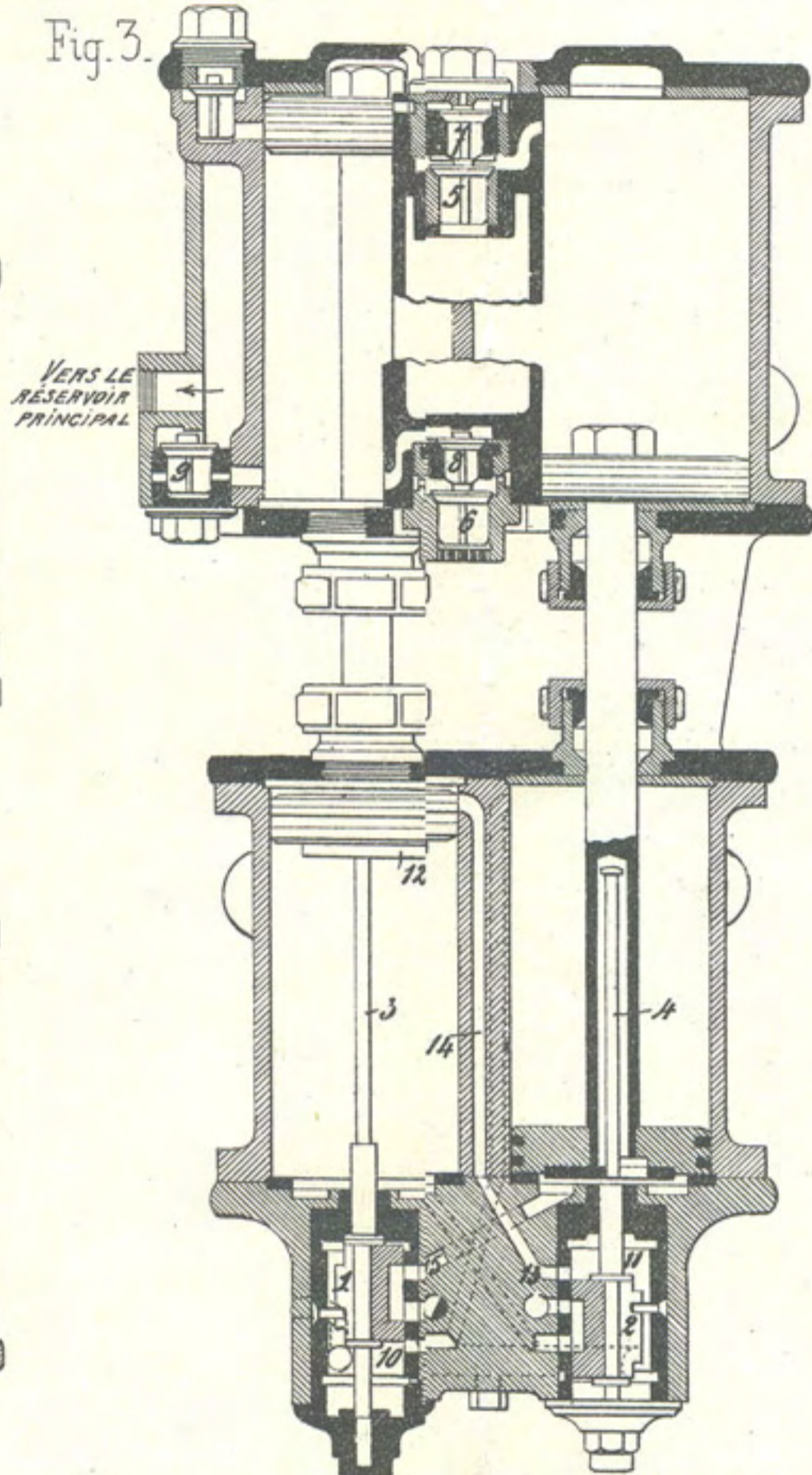
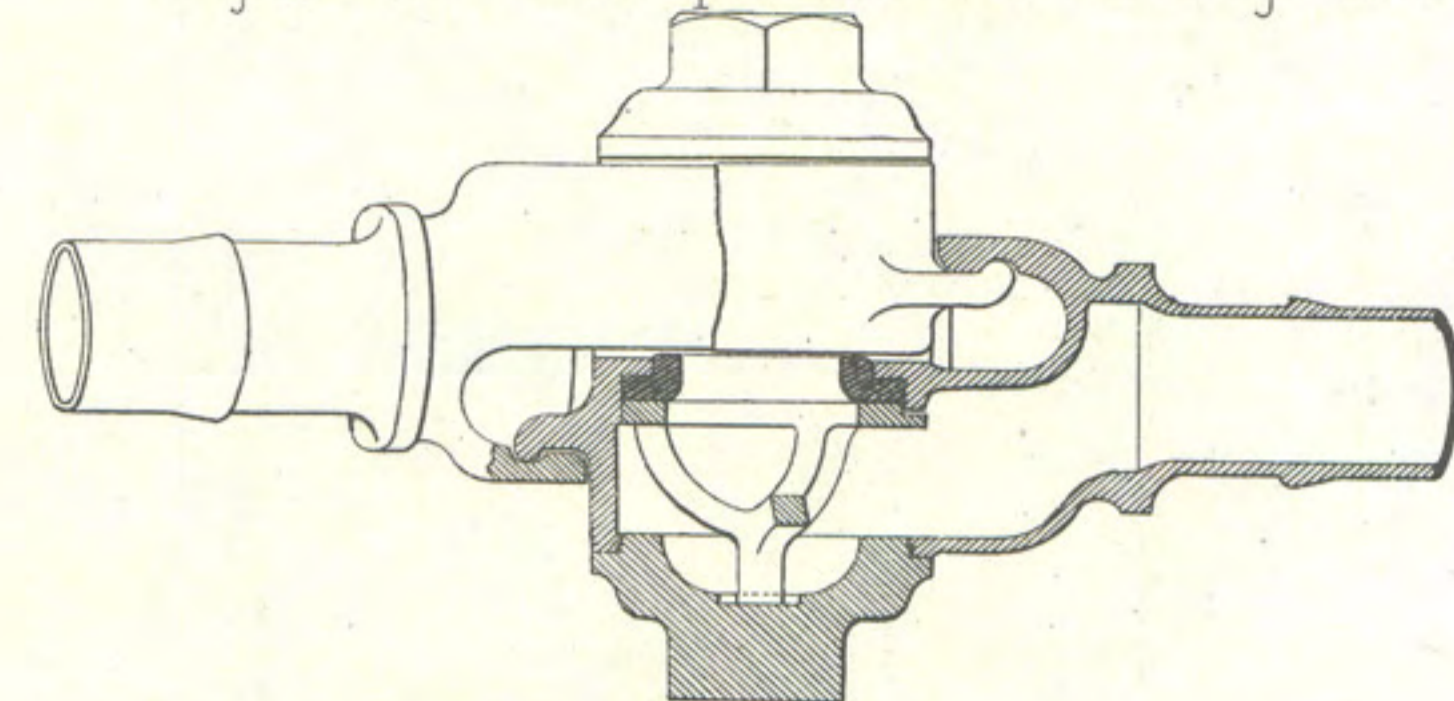
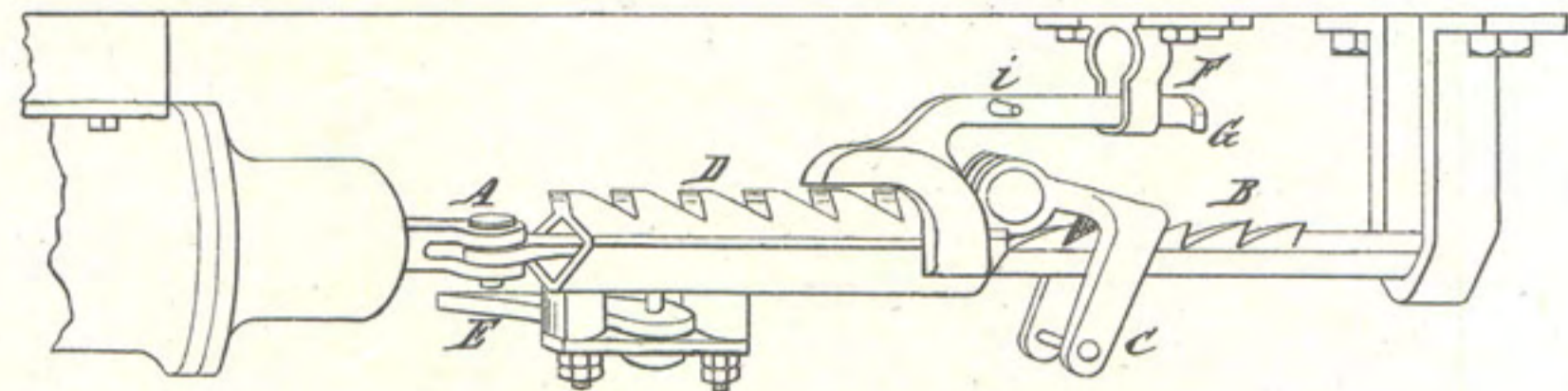
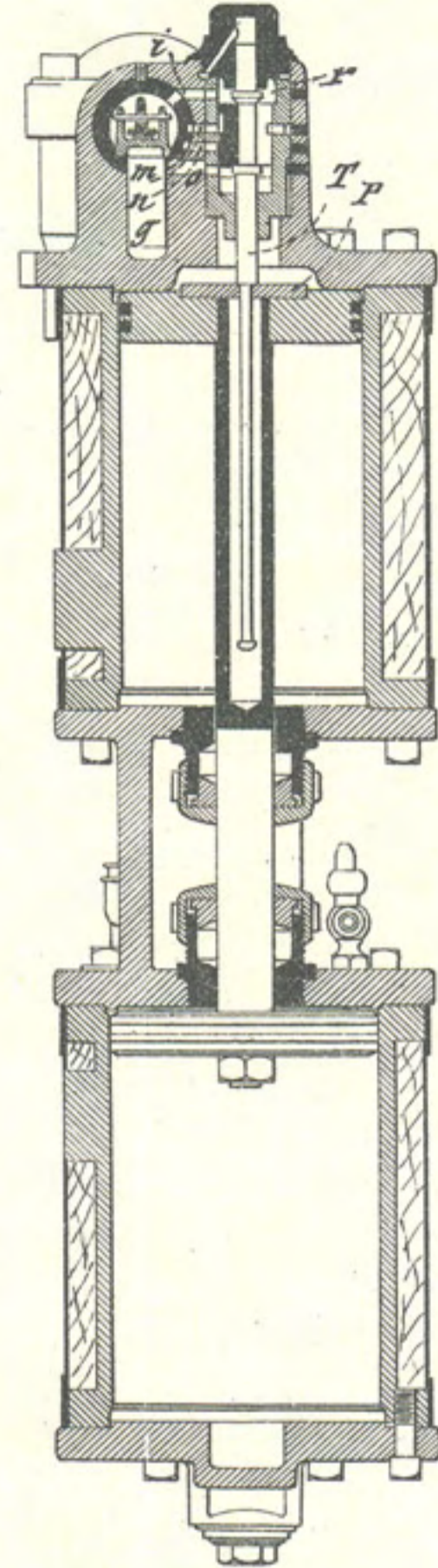
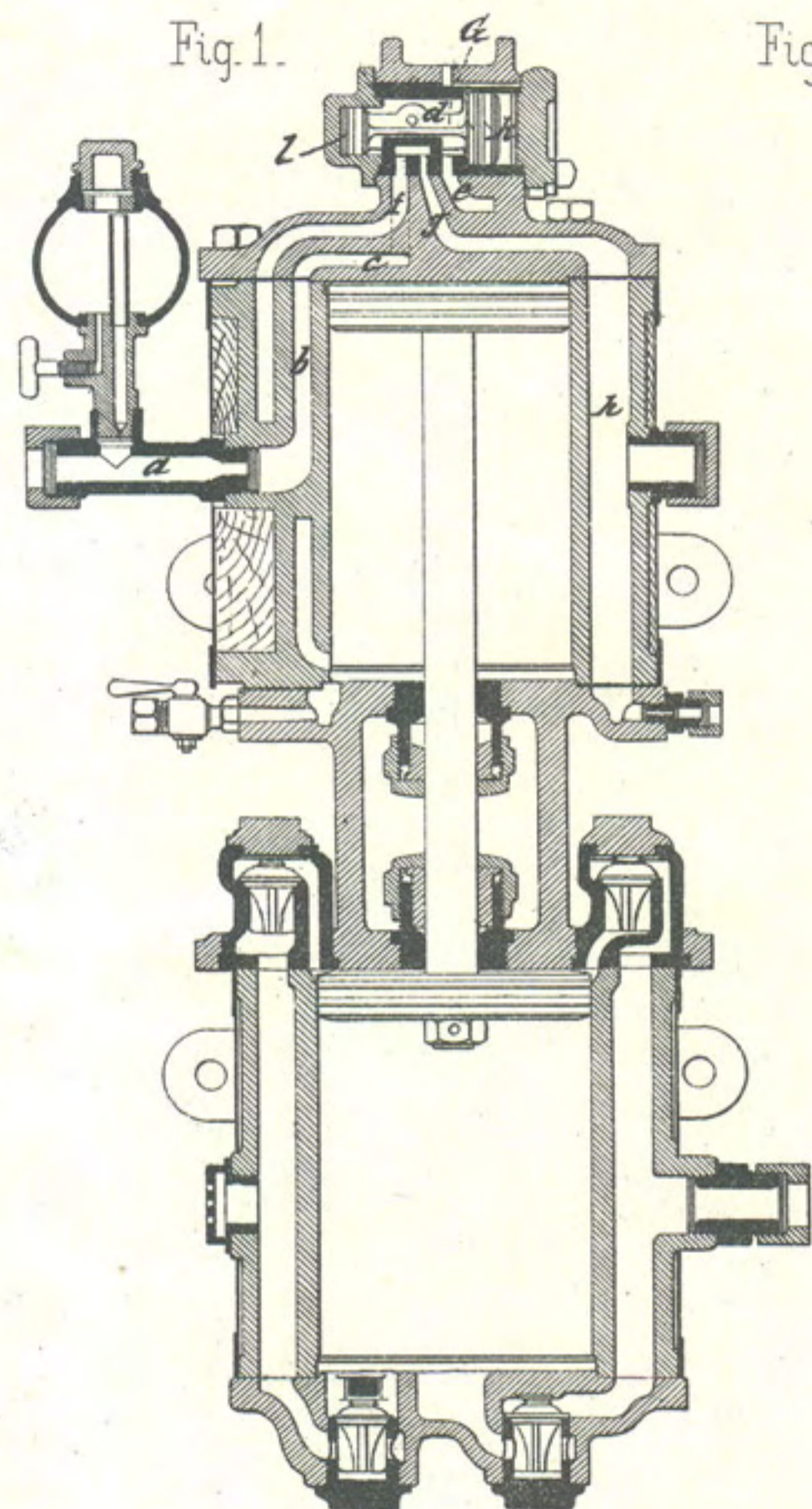


Fig.1 et 2 Nouvelle pompe à air Westinghouse.

Pompe à air Duplex de la New-York Brake Co.

Fig.5. Ajustement automatique des blocs de frein.

Fig.8. Tête d'accouplement du Westinghouse.



Soupape de décharge Wenger.

Valve de purge Westinghouse.

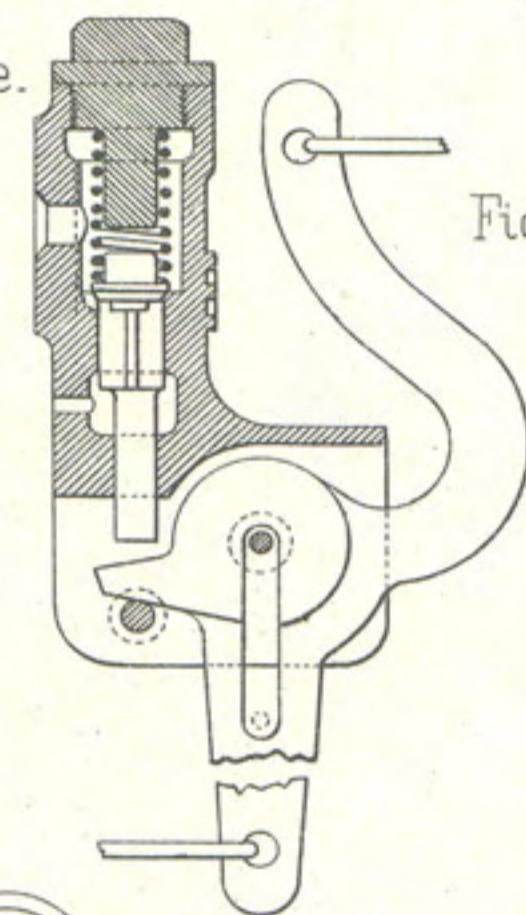
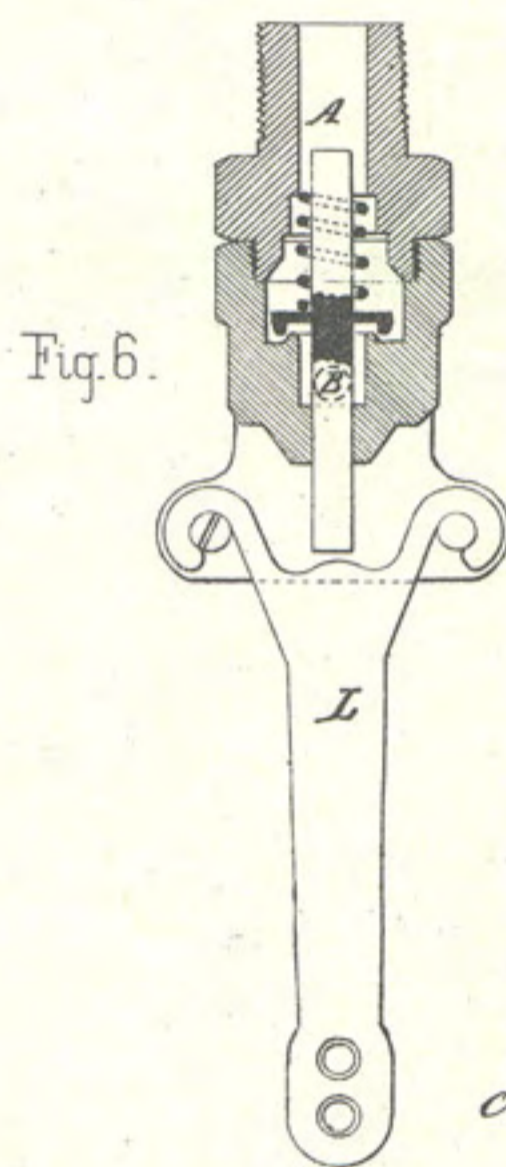


Fig. 9. Boyau d'accouplement Westinghouse monté.

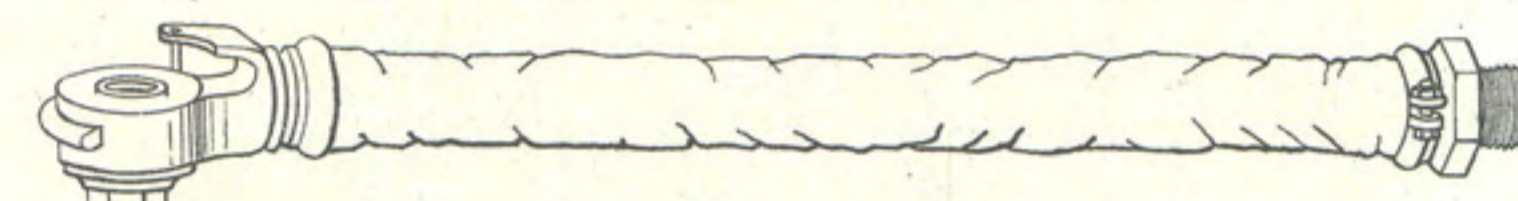


Fig. 10. Boyau d'accouplement Wenger monté.

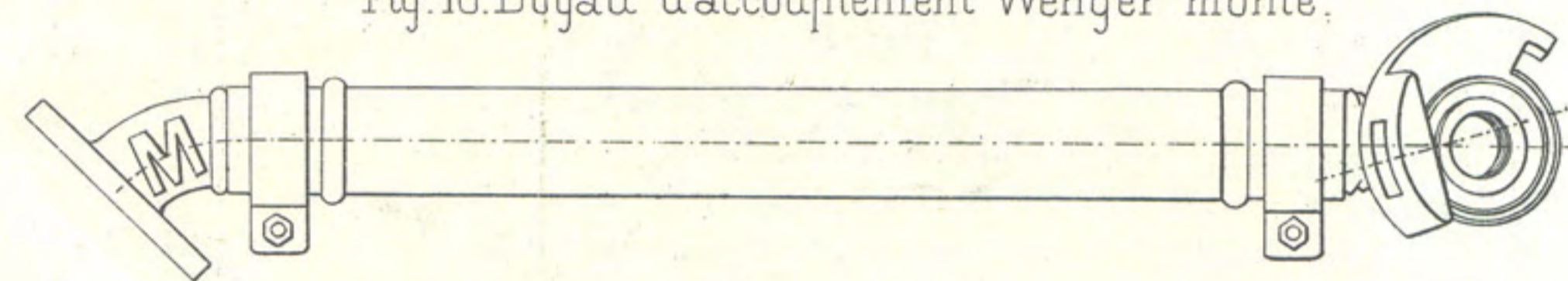


Fig. 4. Cylindre réducteur de Lipkowski.

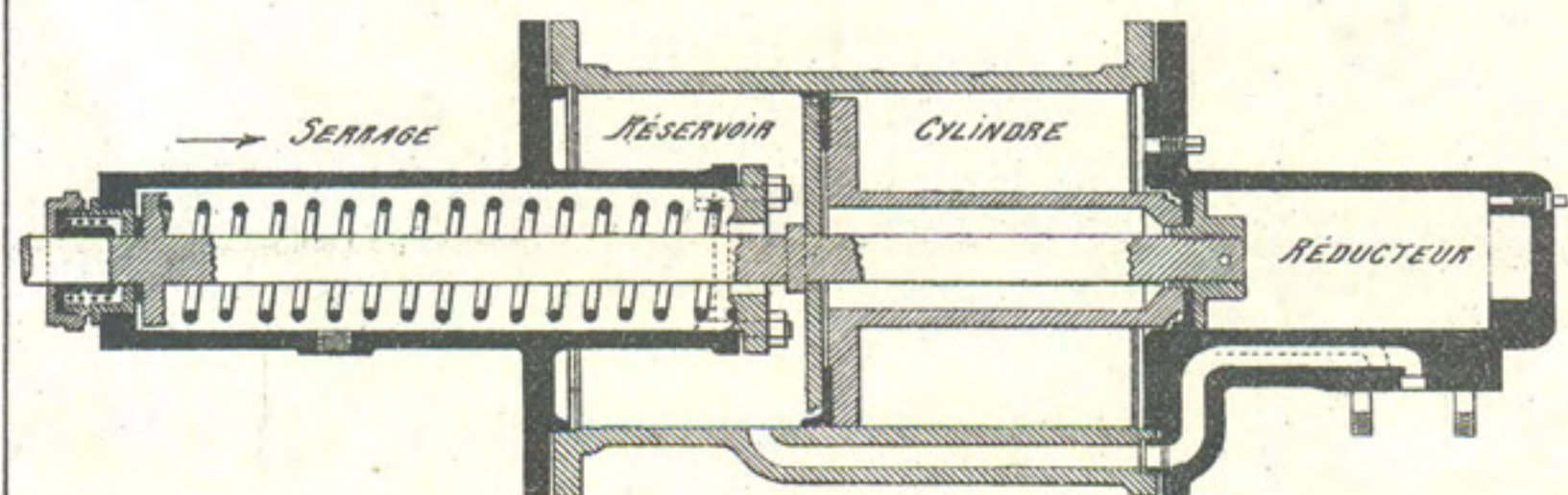


Fig. 11 à 13 Accouplements Westinghouse.

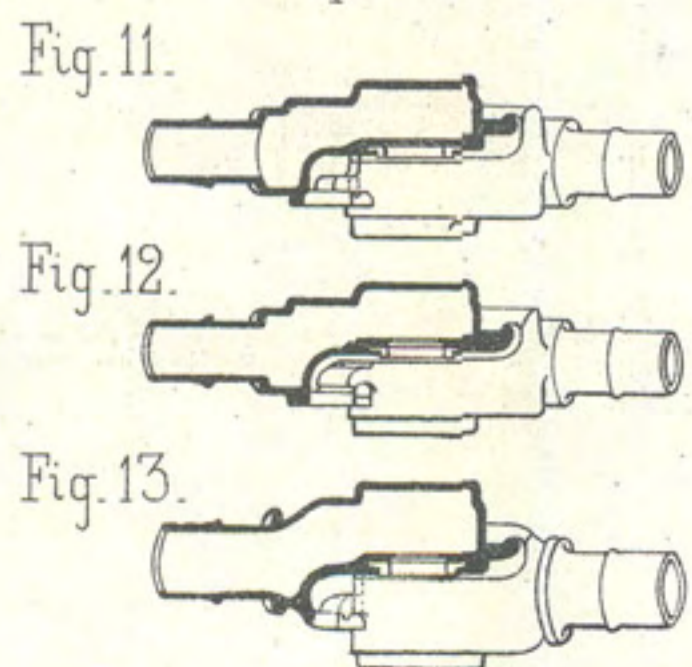


Fig. 14. Accouplement Schleifer.

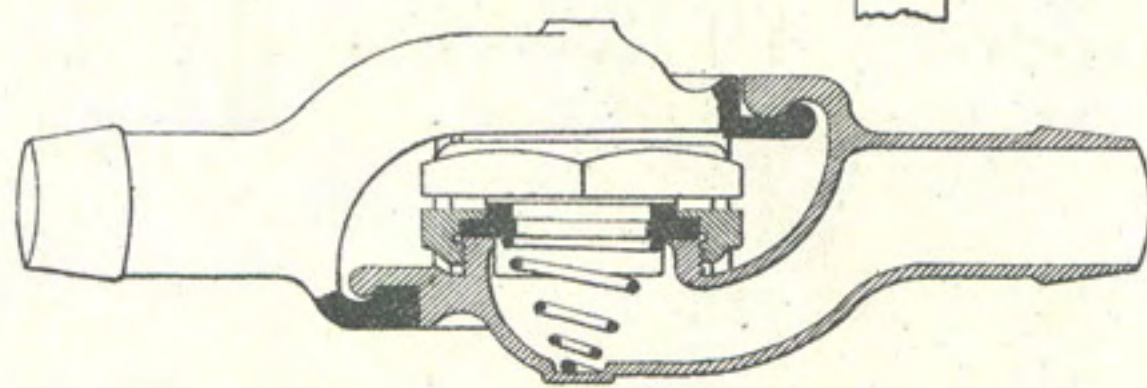


Fig. 16.

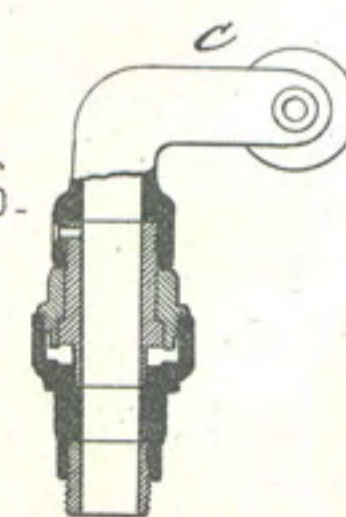


Fig. 15 à 18. Accouplement métallique de Westinghouse.

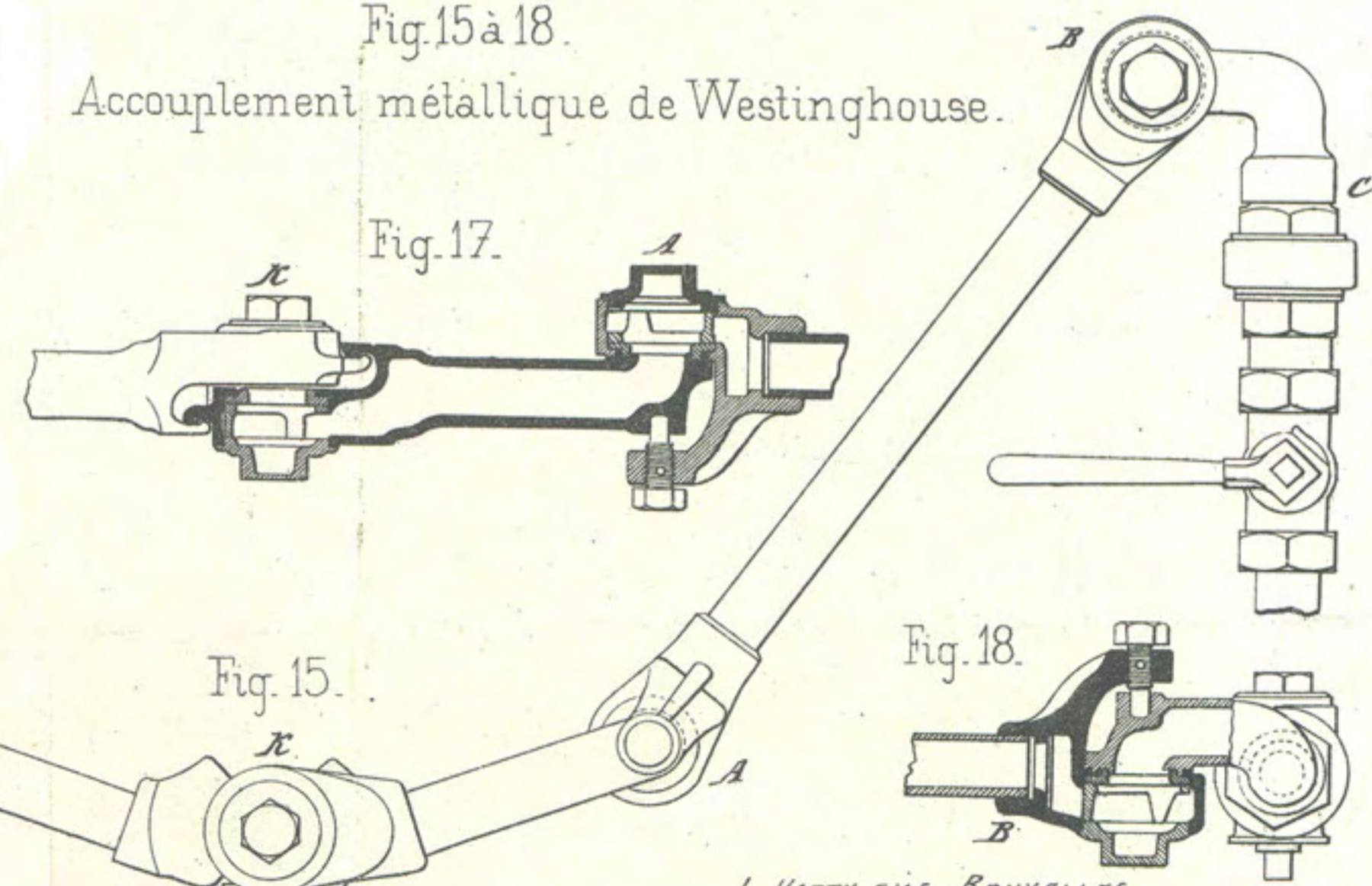


Fig.1 et 2. Frein à vide automatique du Great-Western.

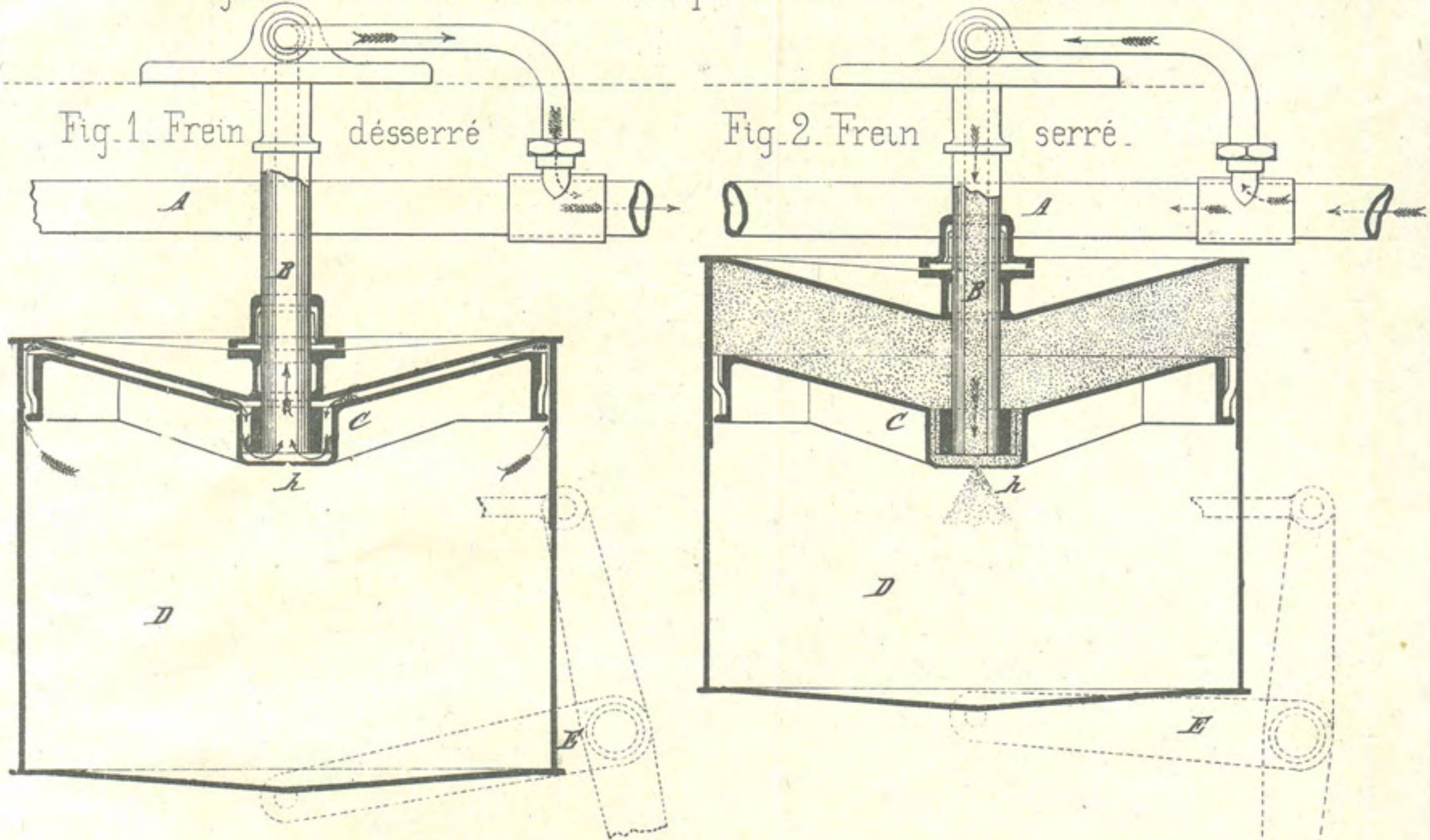
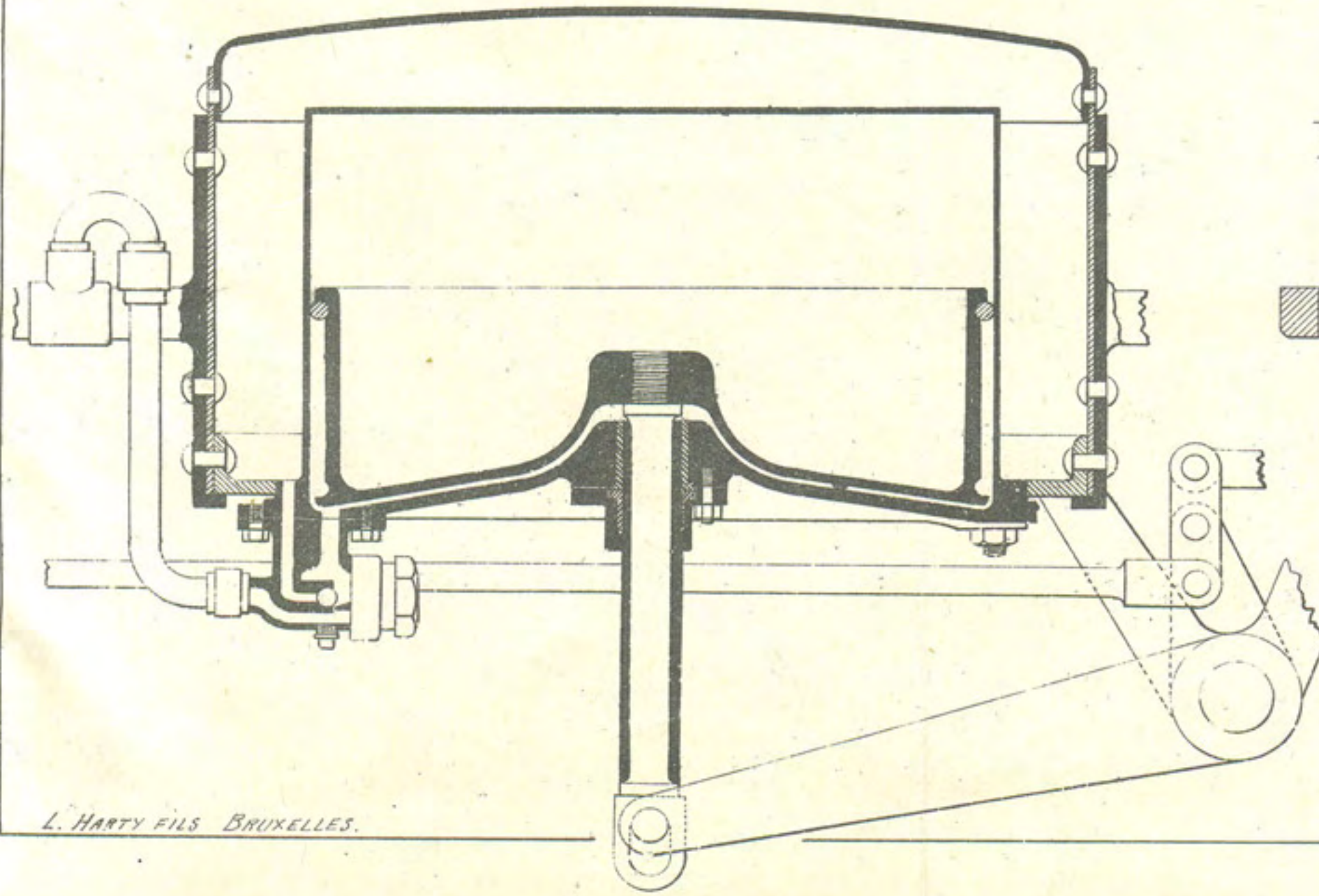


Fig. 3. Ensemble du vase à frein.



L. HARTY FILS BRUXELLES.

Fig. 3 et 4. Frein à vide de Clayton.

Fig. 4. Distributeur à boulet.

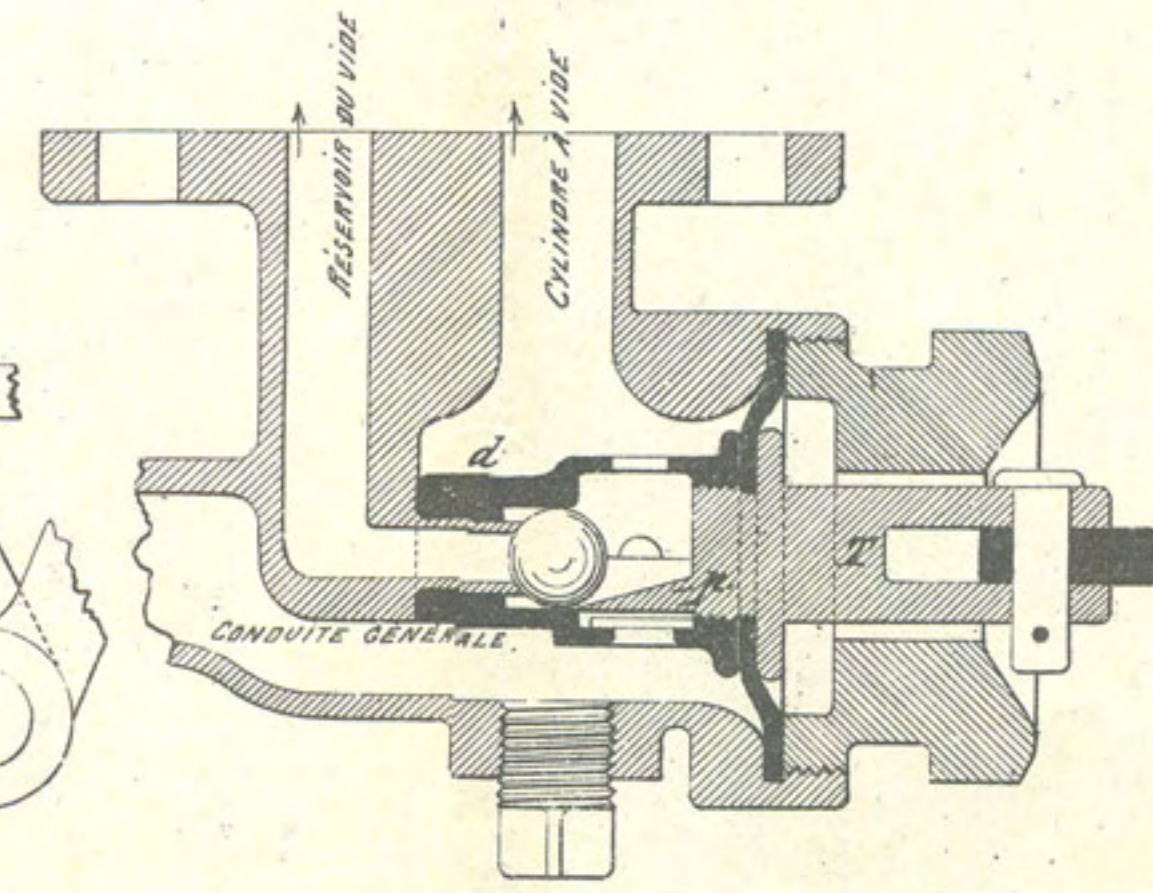


Fig. 5. Vase à frein Körling.

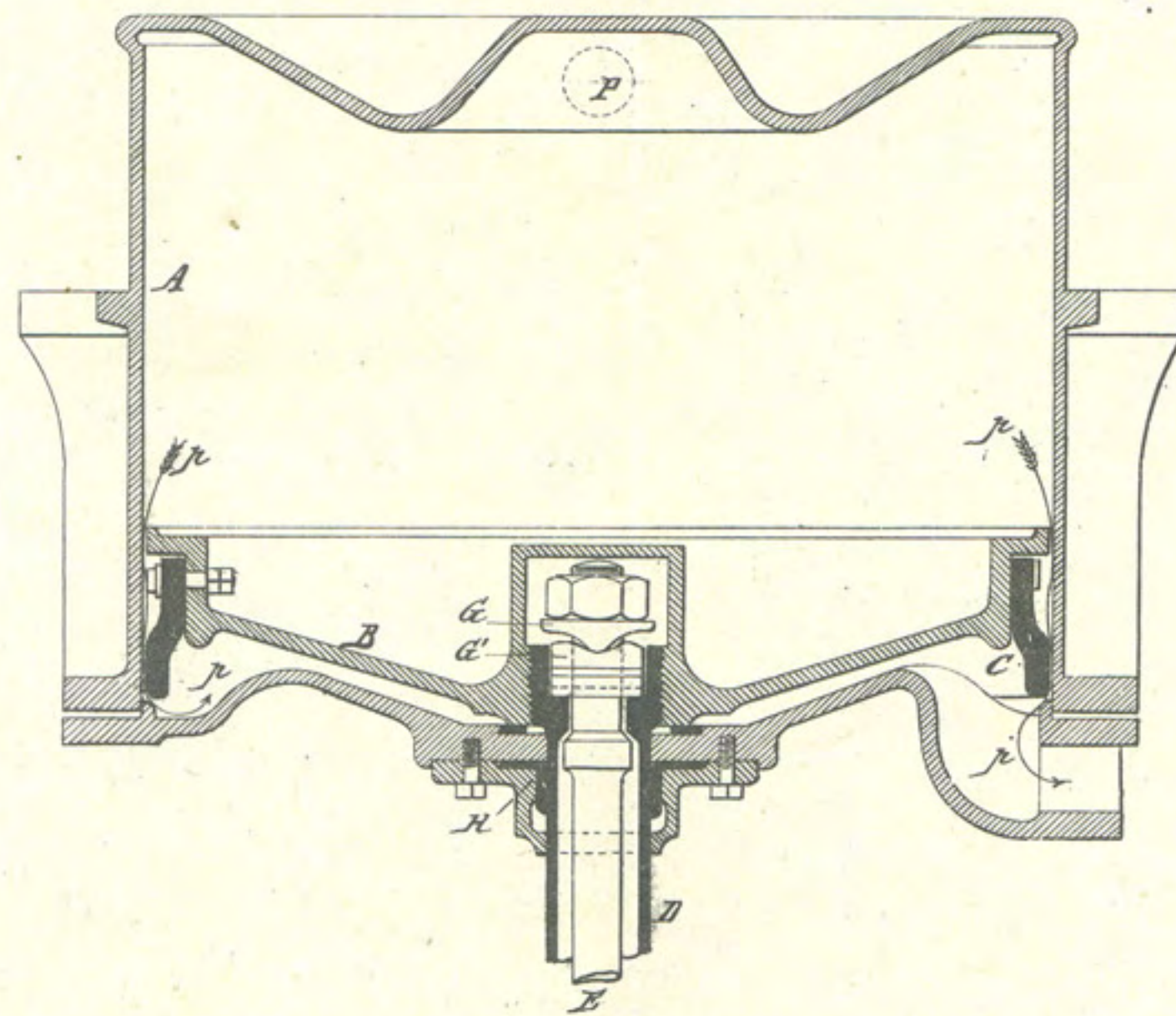


Fig. 11 et 12. Frein électrique Siemens et Bootby.

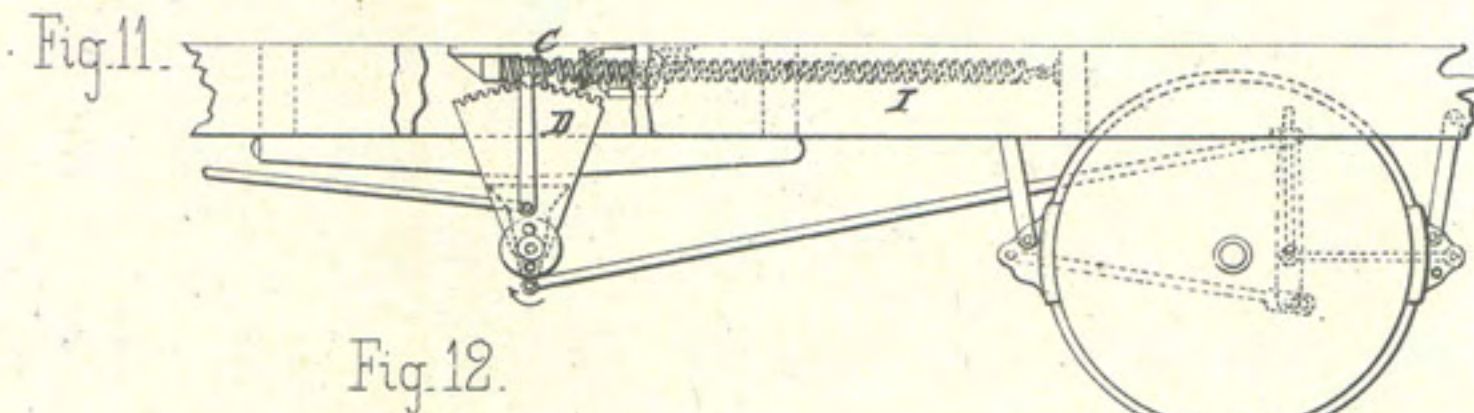


Fig. 6 et 7. Frein à vide automatique de Eames.

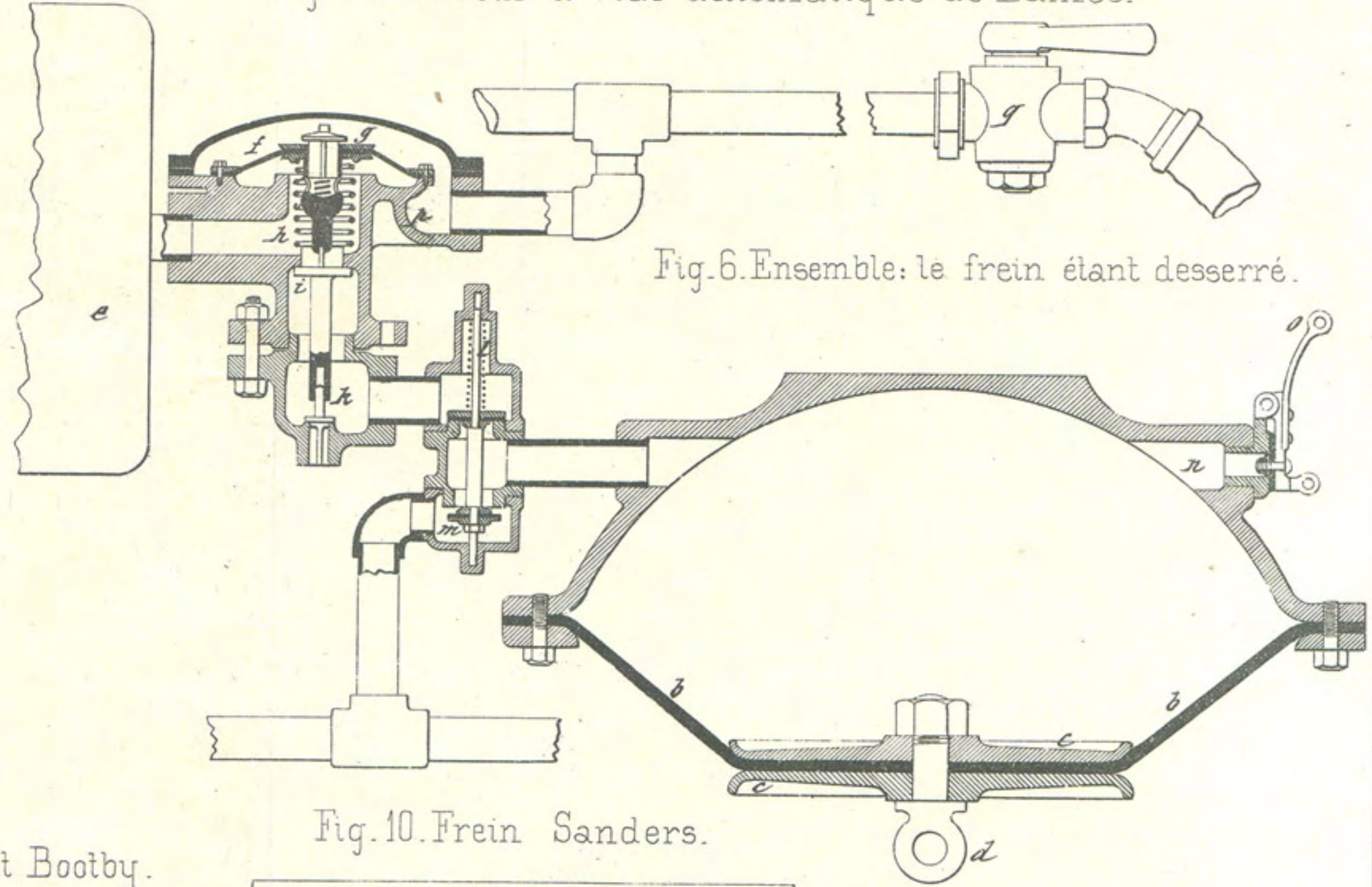


Fig. 10. Frein Sanders.

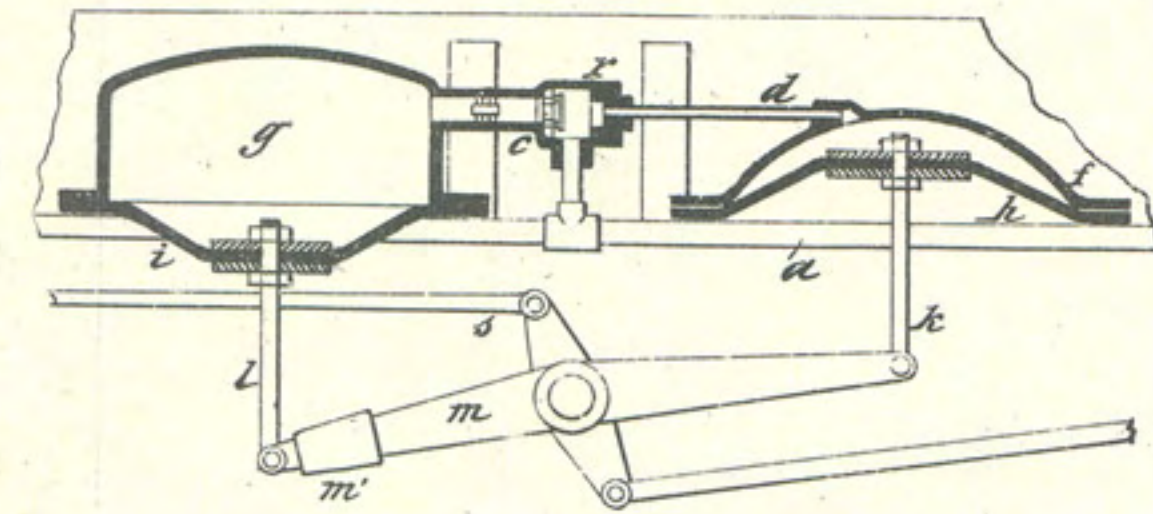


Fig. 7. Distributeur après un serrage.

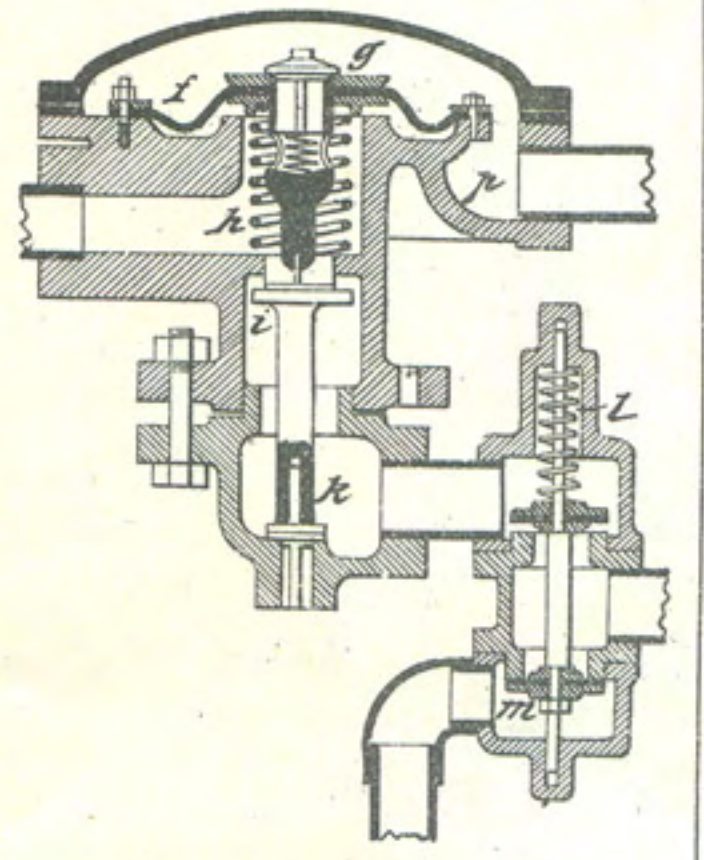


Fig. 8 et 9. Nouveau distributeur Eames.

