

VOIE  
**MATÉRIEL ROULANT**

ET  
**EXPLOITATION TECHNIQUE**

DES  
**CHEMINS DE FER**

OUVRAGE SUIVI D'UN APPENDICE SUR LES TRAVAUX D'ART

PAR

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**TOME TROISIÈME. — 1<sup>ER</sup> FASCICULE.**

PRODUCTION ET DISTRIBUTION DE LA VAPEUR

**ATLAS**

PARIS

**DUNOD, ÉDITEUR,**

Précédemment Carilian-Gœury et V<sup>o</sup> Dalmont,

LIBRAIRE DES CORPS DES PONTS ET CHAUSSÉES ET DES MINES,

QUAI DES AUGUSTINS, n° 49.

1874

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# PLANCHES

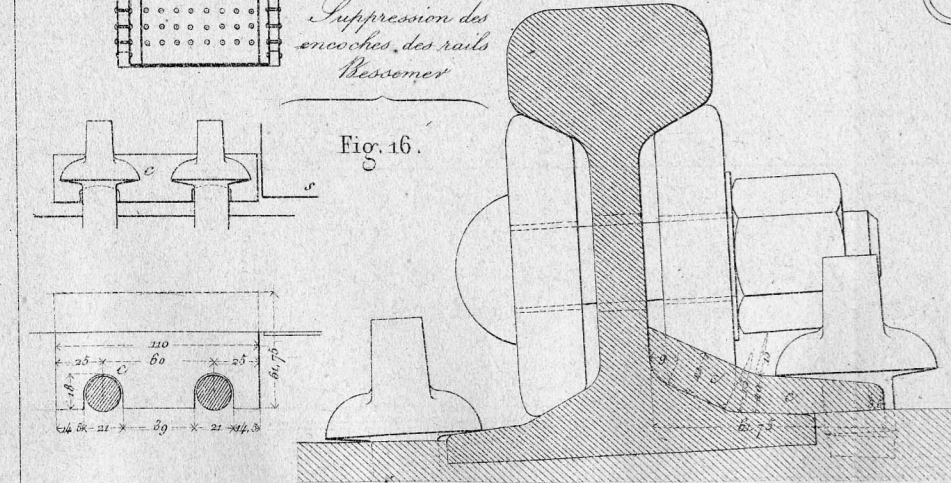
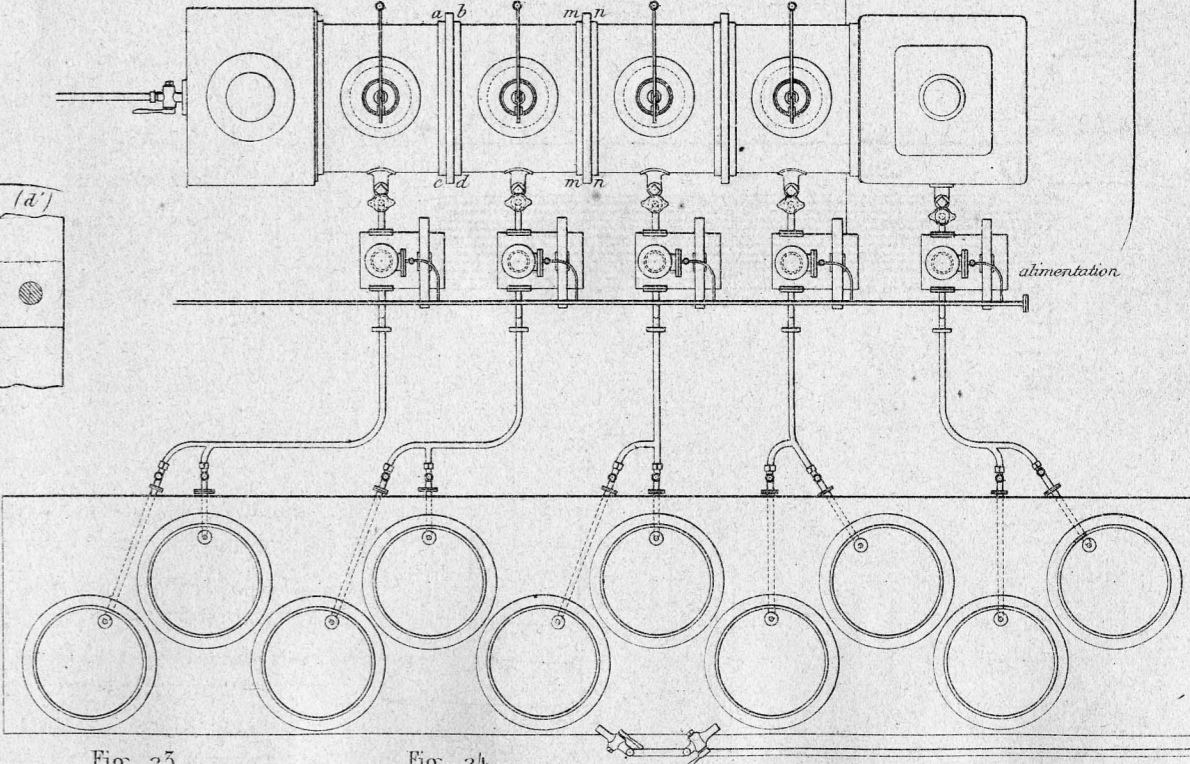
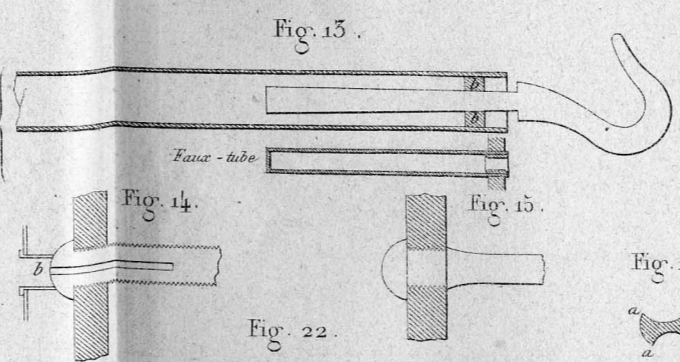
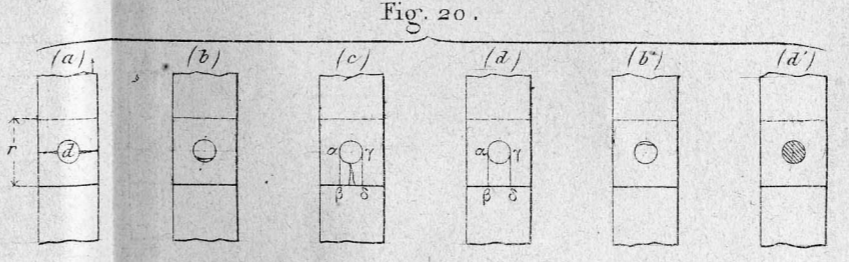
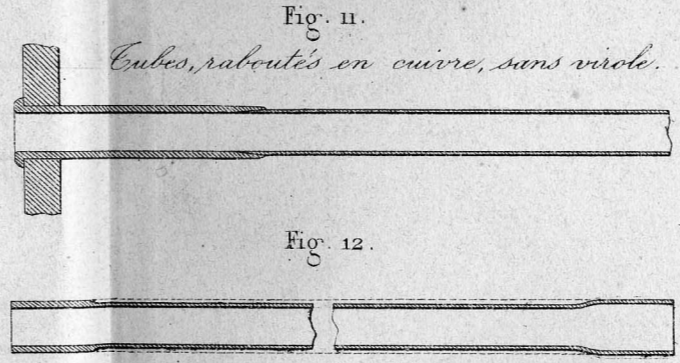
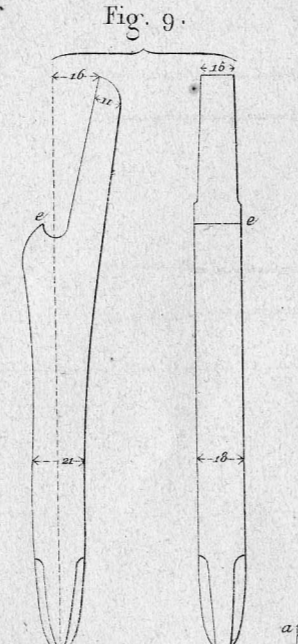
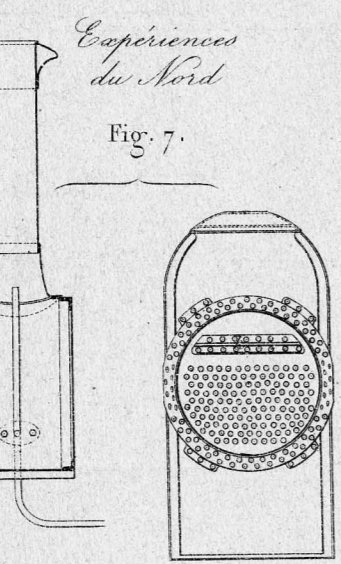
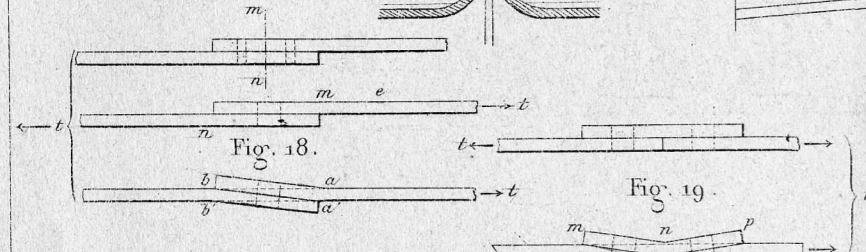
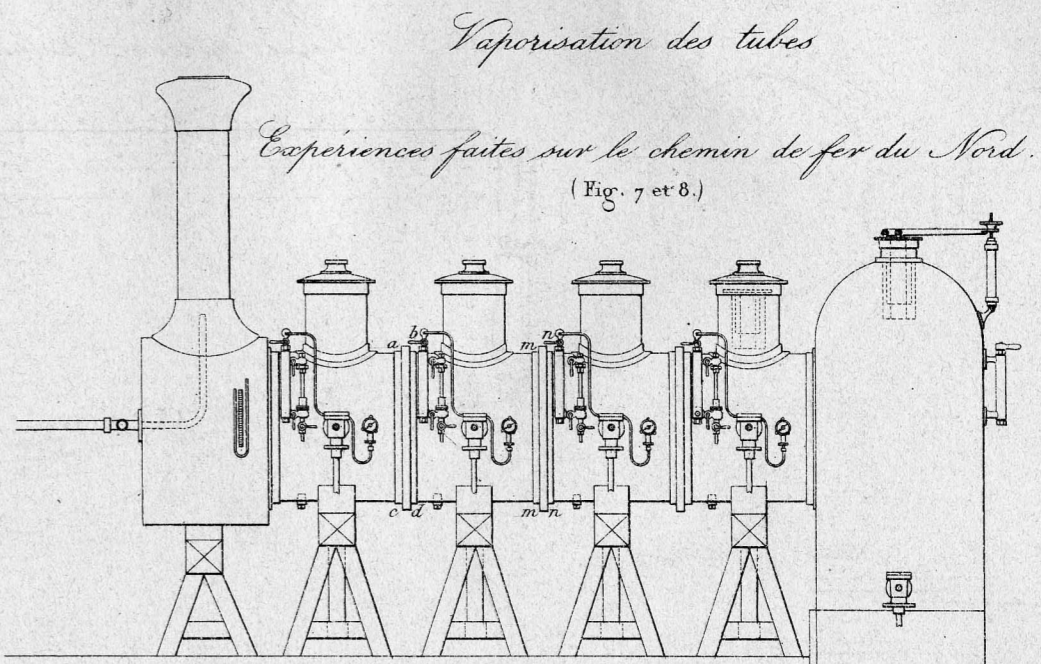
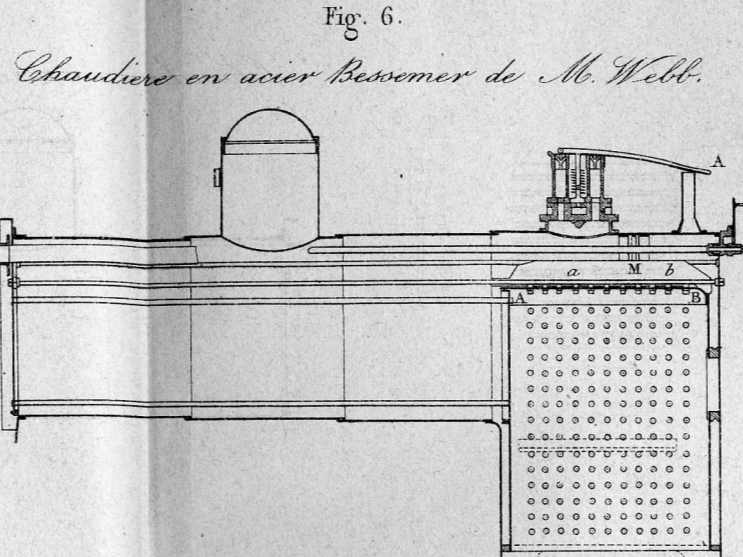
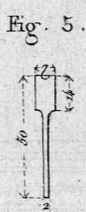
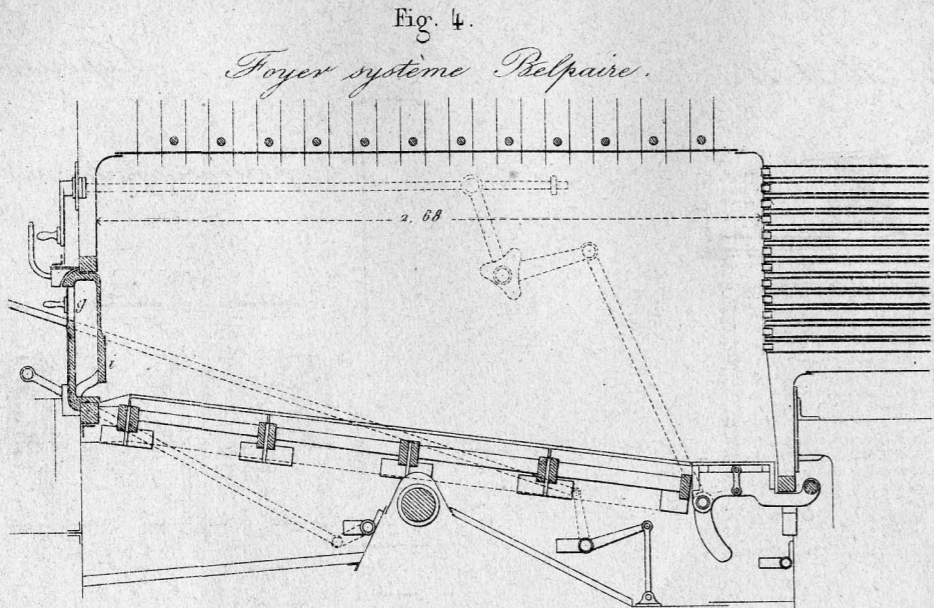
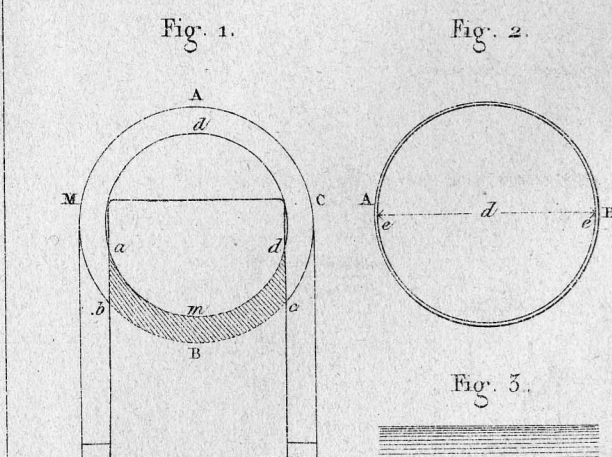
DU

TOME TROISIÈME. — I<sup>ER</sup> FASCICULE

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## PRODUCTION ET DISTRIBUTION DE LA VAPEUR

- Pl. I. — Locomotives. — Chaudières. — Vaporisation. — Détails divers.  
Pl. II. — Locomotives. — Chaudières. — Armatures. — Appareils fumivores. — Condensation.  
Pl. III. — Locomotives. — Chaudières. — Armatures. — Appareils fumivores. — Érosions.  
Pl. IV. — Locomotives. — Chaudières. — Régulateurs. — Soupapes. — Souffleurs.  
Pl. V. — Locomotives. — Échappement. — Cheminées. — Distribution.  
Pl. VI. — Locomotives. — Distributions diverses.  
Pl. VII. — Locomotives. — Distributions diverses.



Echelle des Fig. 4 et 5 de 0<sup>m</sup> 033 pour 1 mètre  
 Echelle des Fig. 6, 7 et 8 de 0<sup>m</sup> 02 pour 1 mètre  
 Echelle des Fig. 11 à 15 de 0<sup>m</sup> 20 pour 1 mètre  
 Echelle des Fig. 16 (ensemble) de 0<sup>m</sup> 25 pour 1 mètre  
 Echelle de la Fig. 16 (Coupe) de 0<sup>m</sup> 50 pour 1 mètre

Fig. 8.

Fig. 1. Chaudière de M. Fairlie.

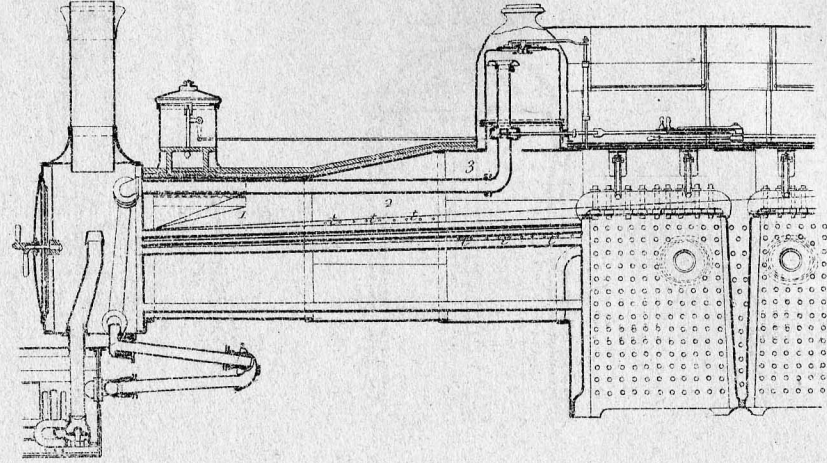


Fig. 2.

Foyer à berceau circulaire.

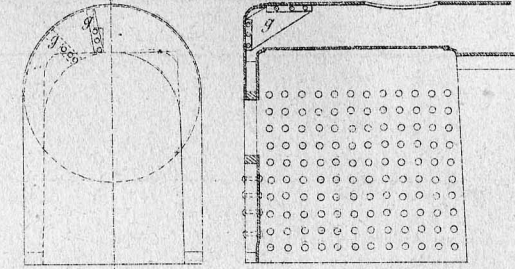


Fig. 6. Porte à feu à profil mixte de M. Becker (chemin du Nord autrichien), chaudière en acier à deux vitres.

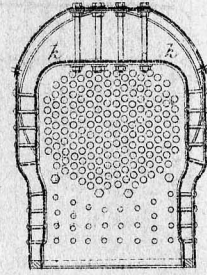


Fig. 5. Foyer de M. Connell à bouilleur et à armatures en travers du ciel.

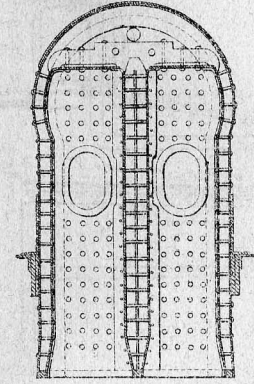
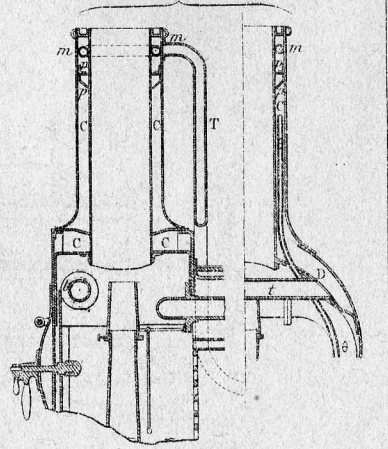


Fig. 14.



Condensation de la vapeur d'échappement. (Signe de Cossus.) (Fig. 16 et 17.)

Fig. 16.

Fig. 17.

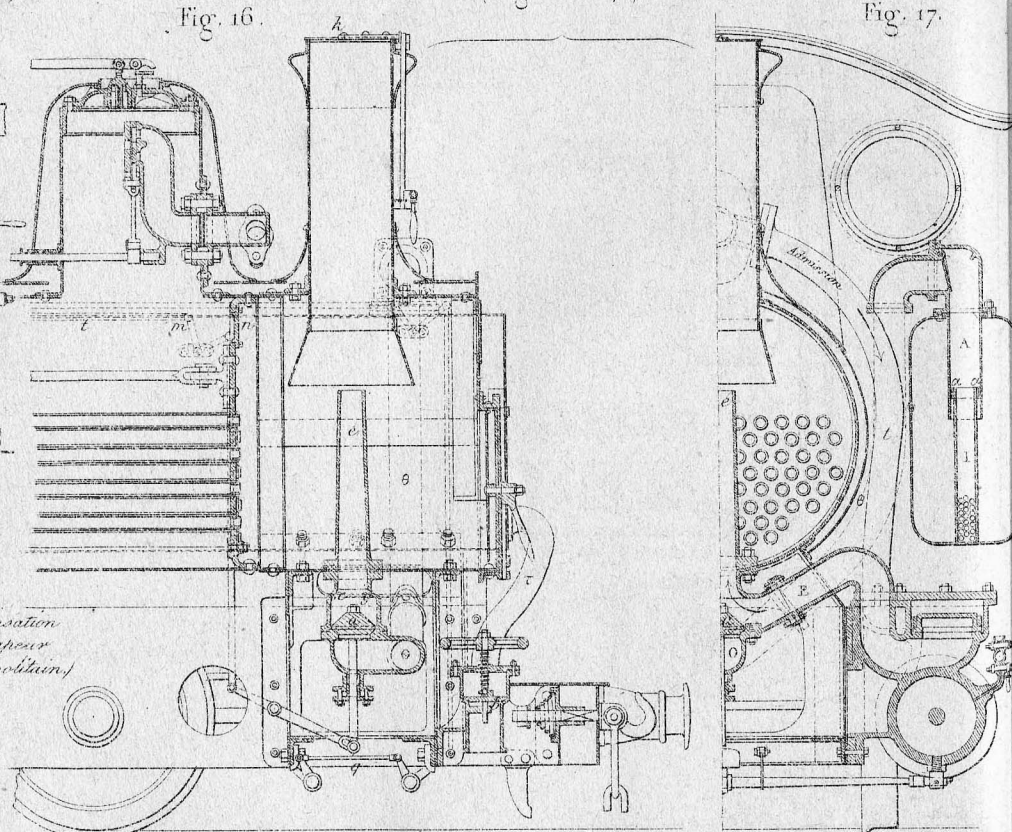


Fig. 4. Chaudière de la Société de construction de Berlin (Exposition de Vienne en 1873).

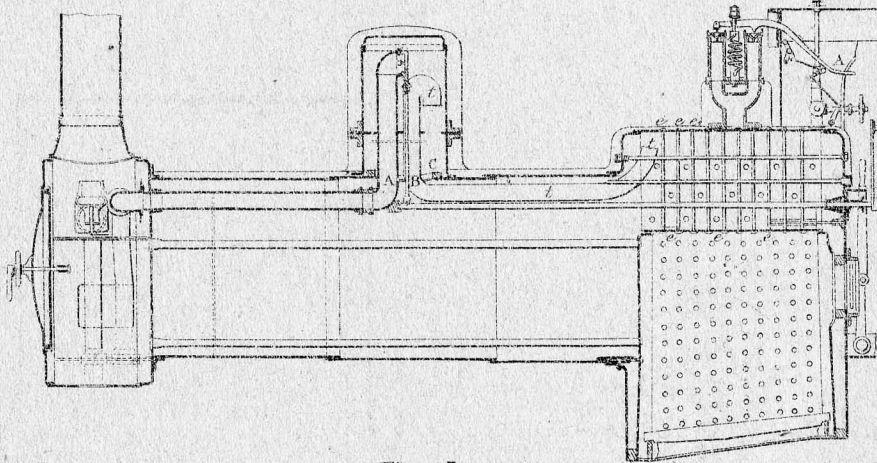
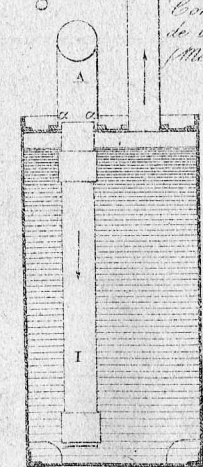
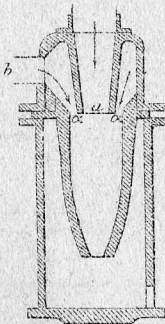
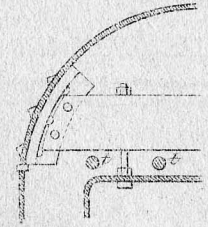


Fig. 3. Machine de Cavenus. Armatures transversales.

Fig. 13.

Fig. 15.

Condensation de la vapeur (Metropolitain).

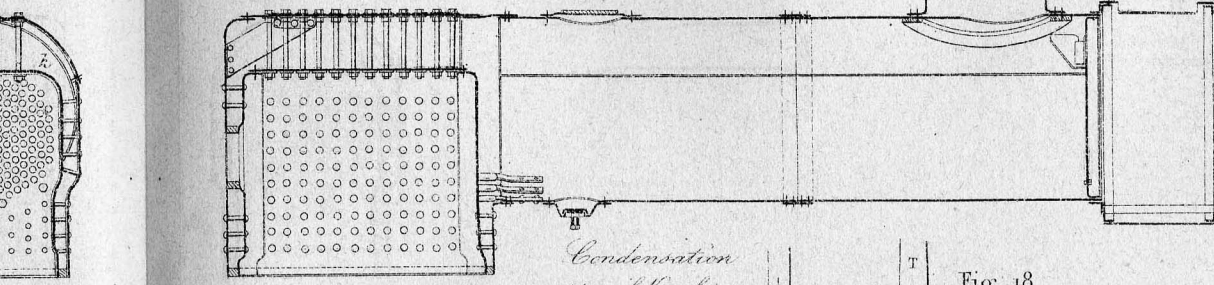


Echelle des Fig. 1, 2, 4, à 8 et 14 de 0<sup>m</sup> 02 pour 1 mètre

Echelle des Fig. 3 et 13 de 0<sup>m</sup> 08 pour 1 mètre

Echelle des Fig. 15 à 17 de 0<sup>m</sup> 05 pour 1 mètre

Echelle des Fig. 9 à 12 de 0<sup>m</sup> 20 pour 1 mètre



Condensation appareil Kerschberger Fig. 18.

Appareil fumivore Cherry. (Fig. 8 à 12.)

Fig. 8.

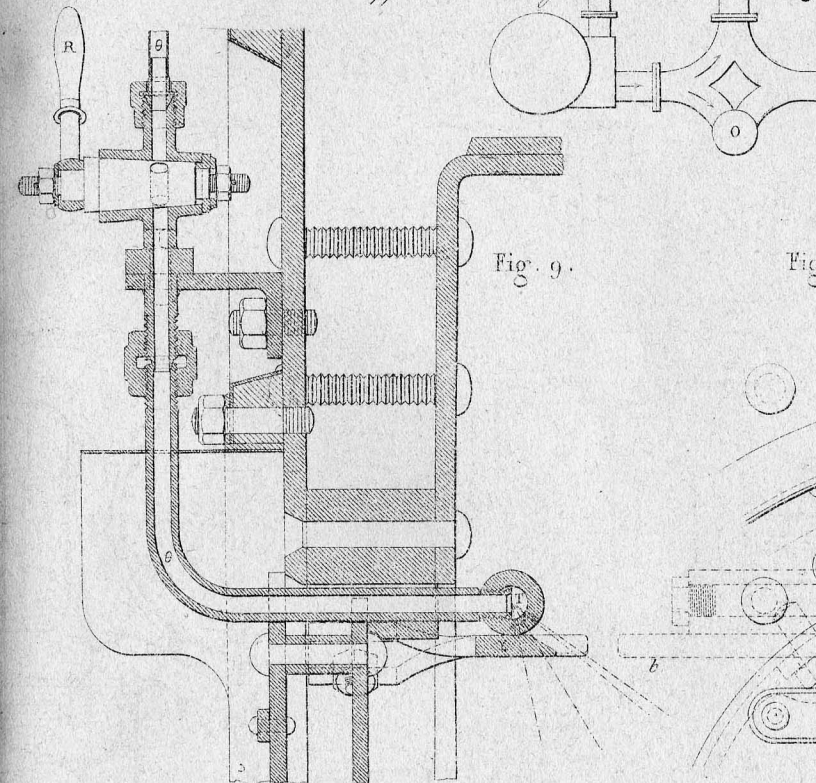


Fig. 9.

Fig. 10.

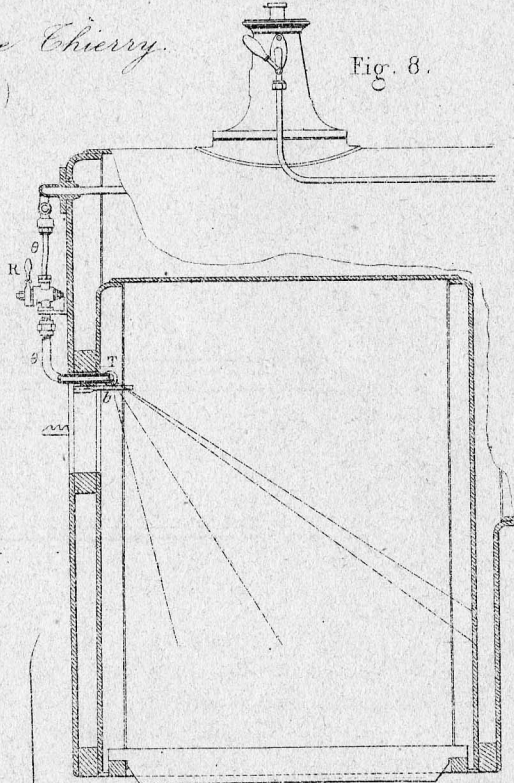


Fig. 7. Souffleur ordinaire.

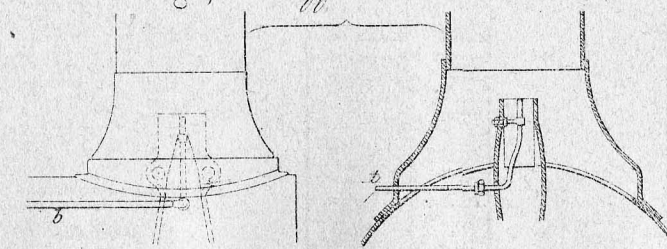


Fig. 11.

Plan vertical moyen de la chaudière

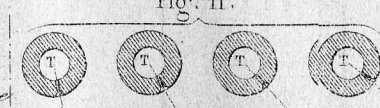


Fig. 19.

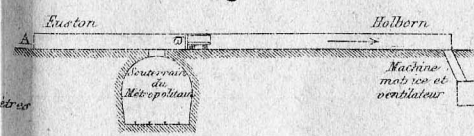
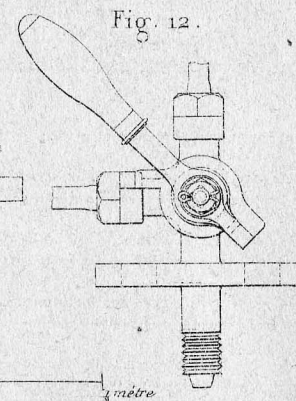


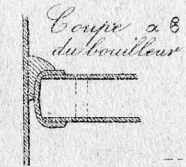
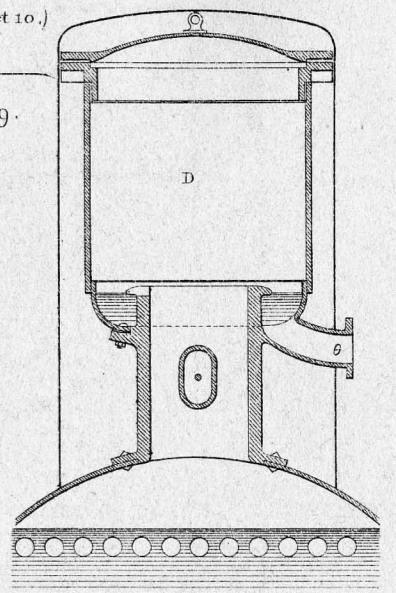
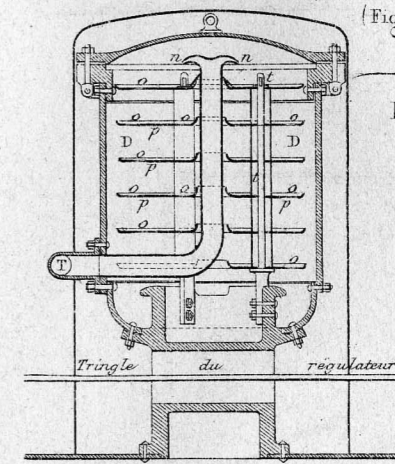
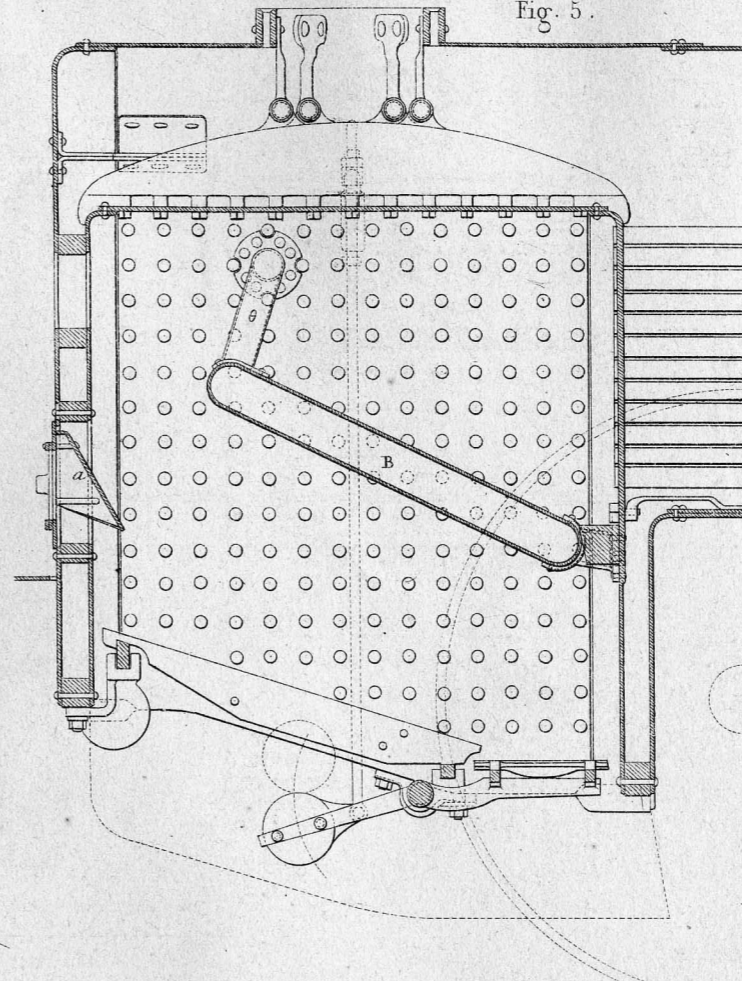
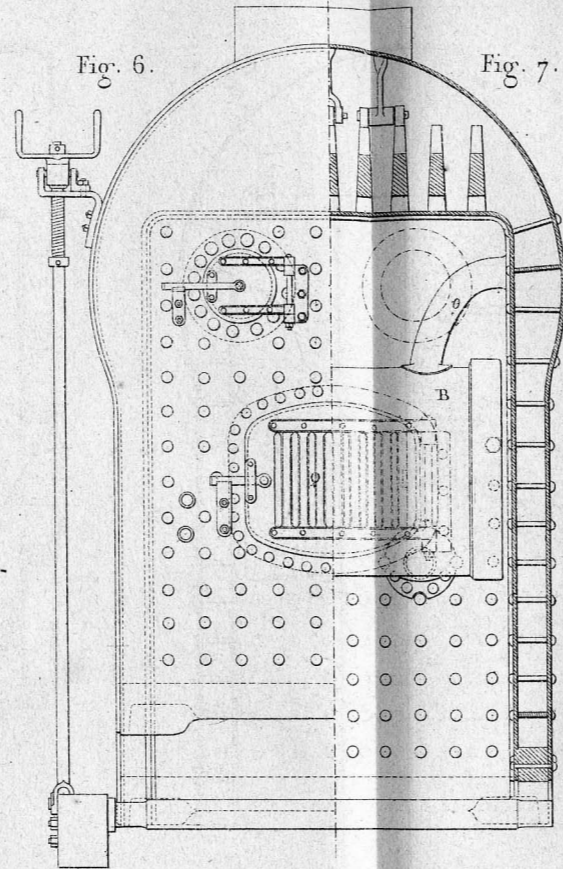
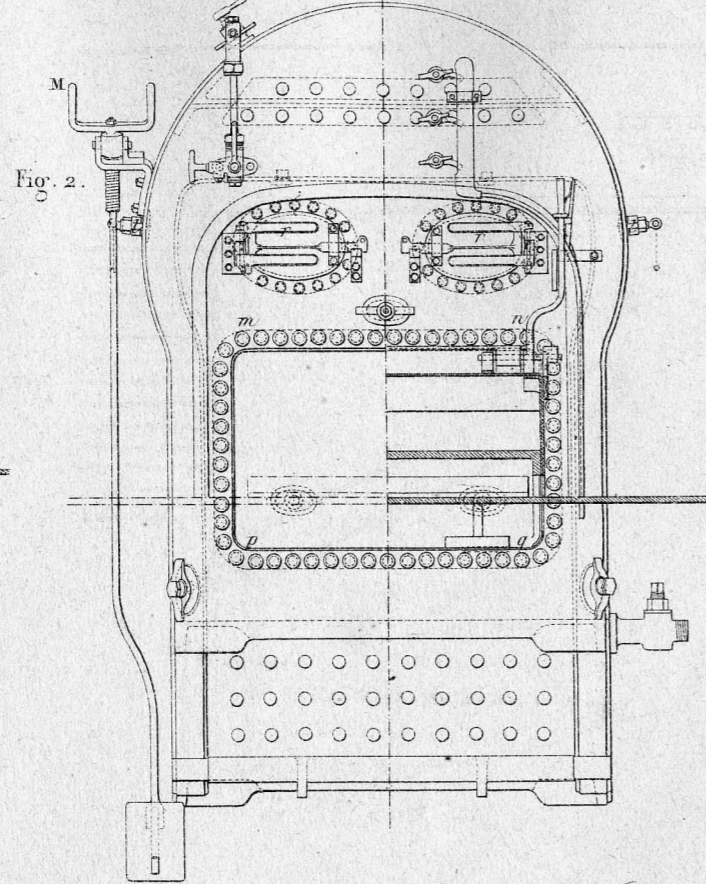
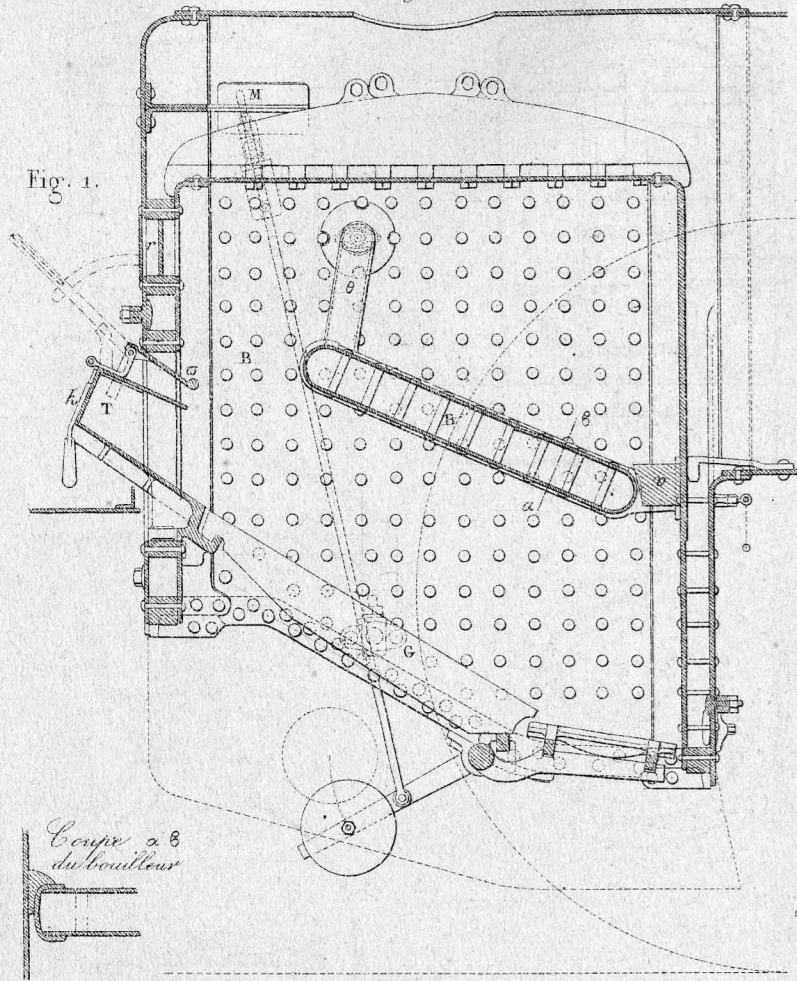
Fig. 12.



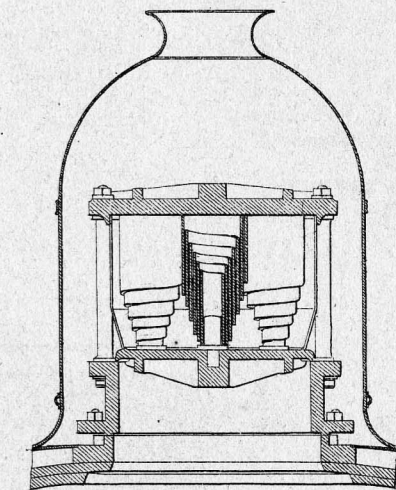
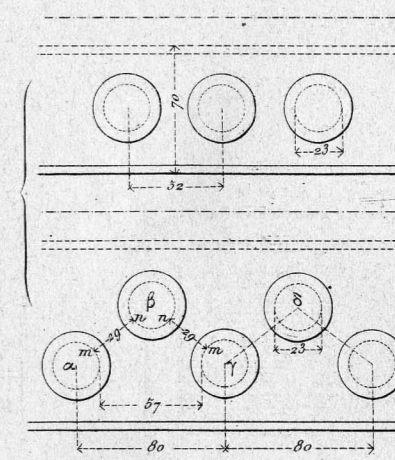
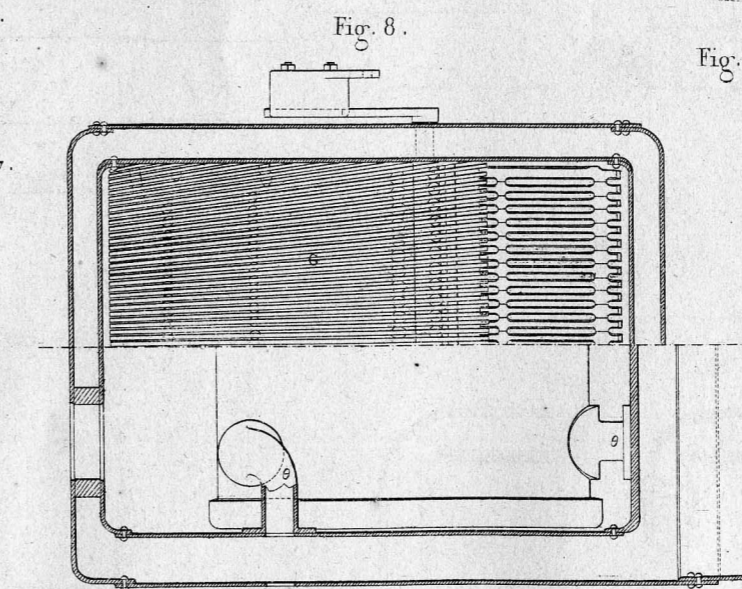
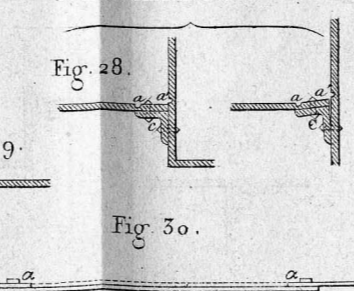
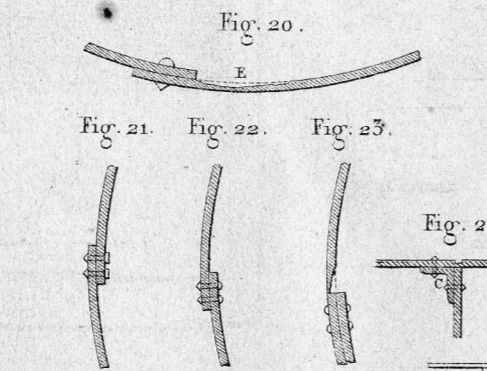
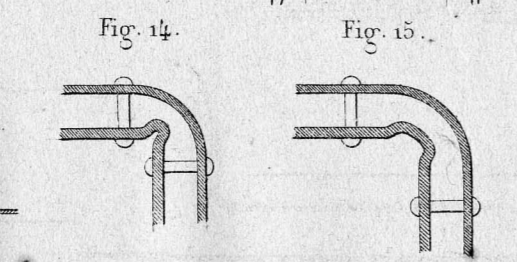
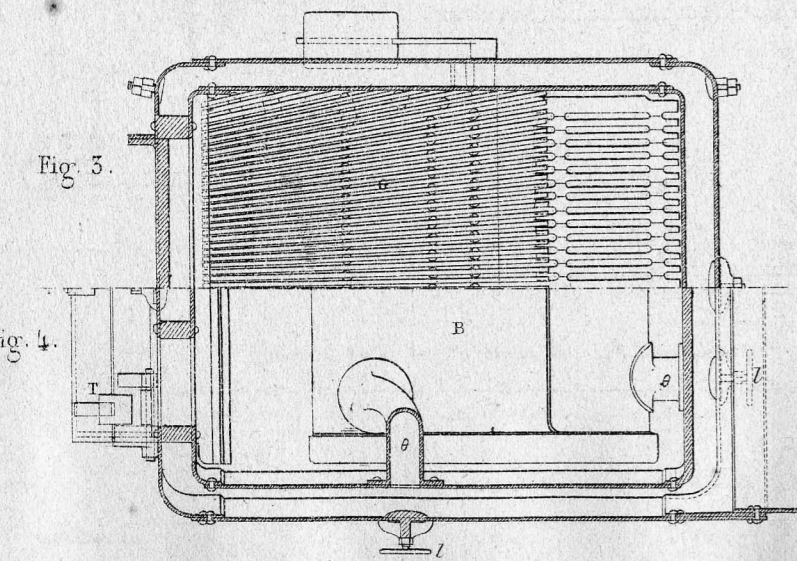
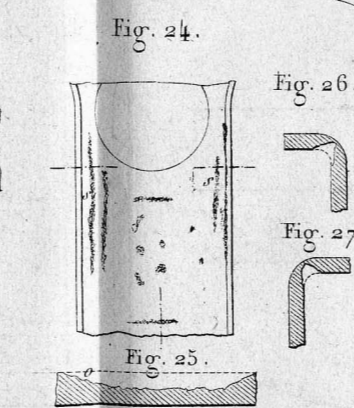
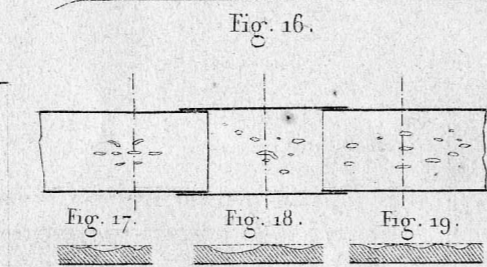
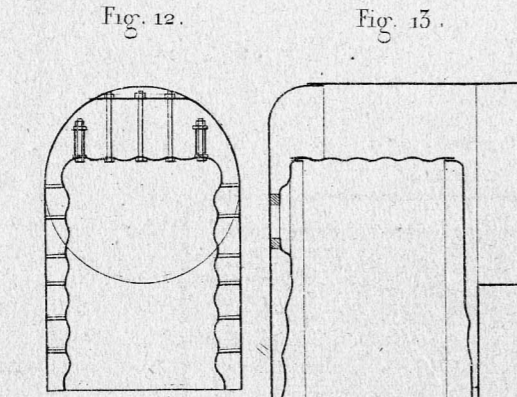
Foyer Cenbrinck du chemin d'Orléans (Fig. 1 à 4.)

Foyer Bonnet du chemin d'Orléans (Fig. 5 à 8.)

Appareil Schau. (Fig. 9 et 10.)

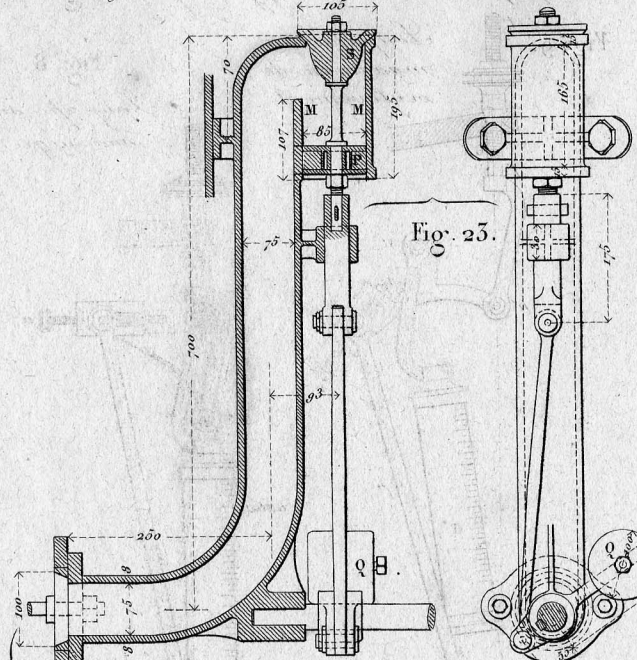


Foyer à feuilles ondulées de M. Krauss. Erosions et sillons des chaudières (Fig. 16 à 29.)

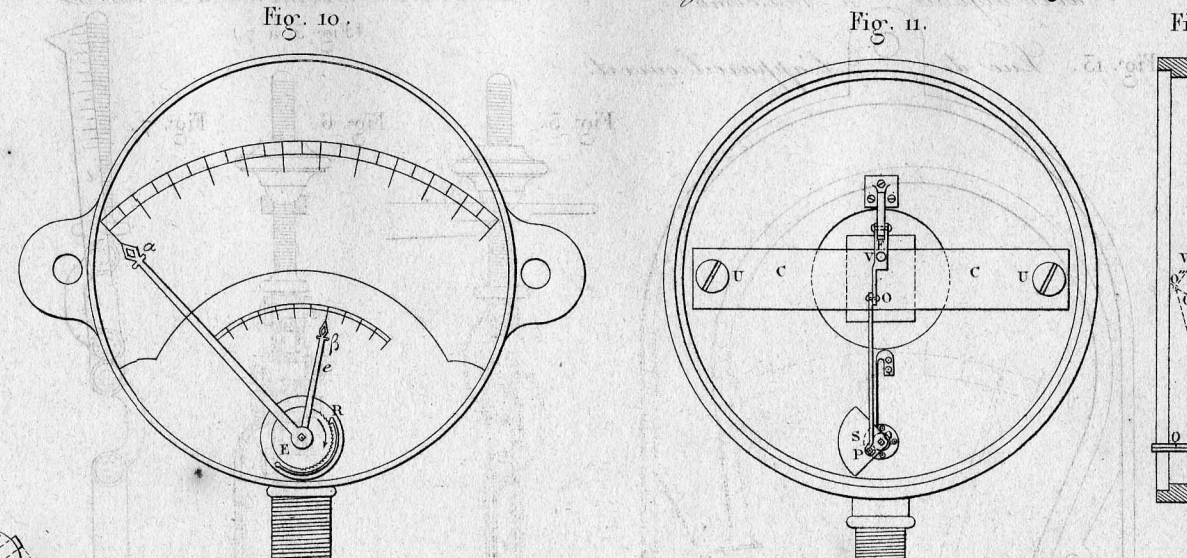


Echelle des Fig. 1 à 30 de 0<sup>m</sup> 05 pour 1 mètre  
 Echelle des Fig. 29 et 30 de 0<sup>m</sup> 25 pour 1 mètre  
 0.4 décimètre

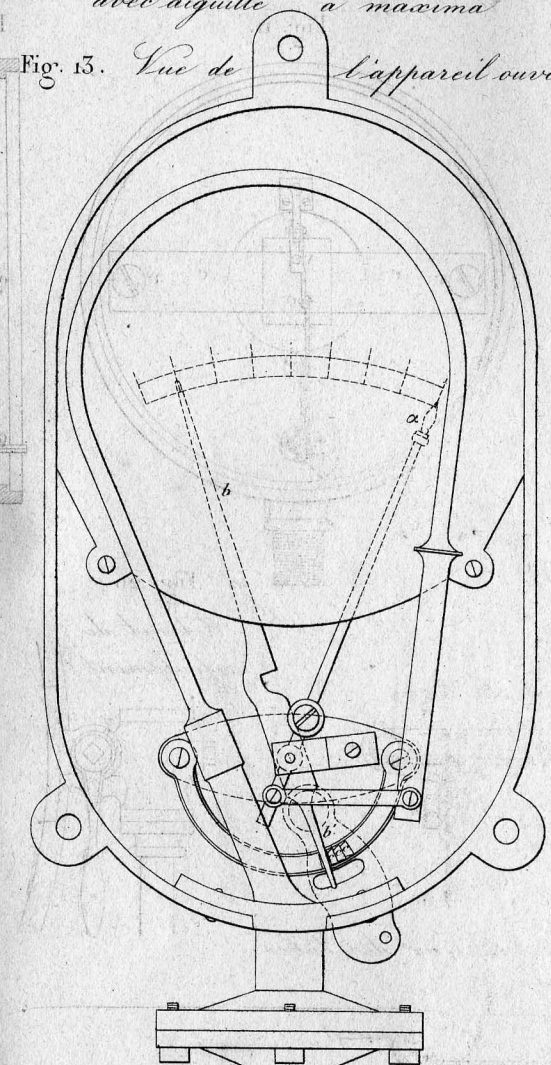
Régulateur équilibré (Figures 23)



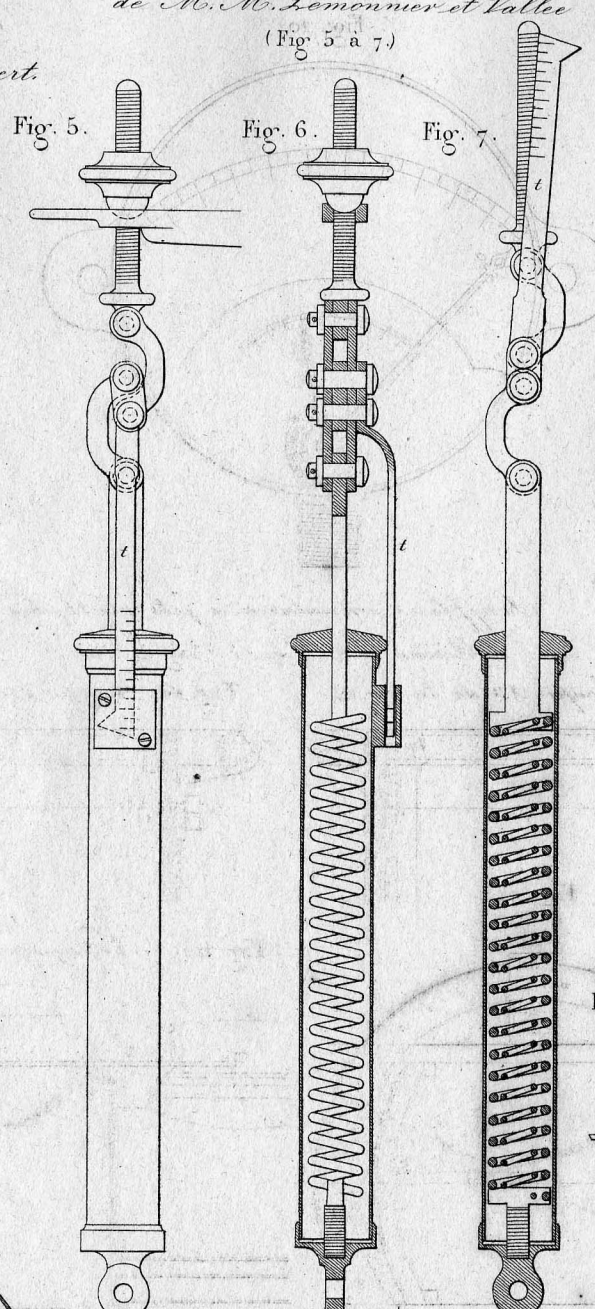
Manomètre Dedieu avec aiguille à maxima (Fig. 10 à 12.)



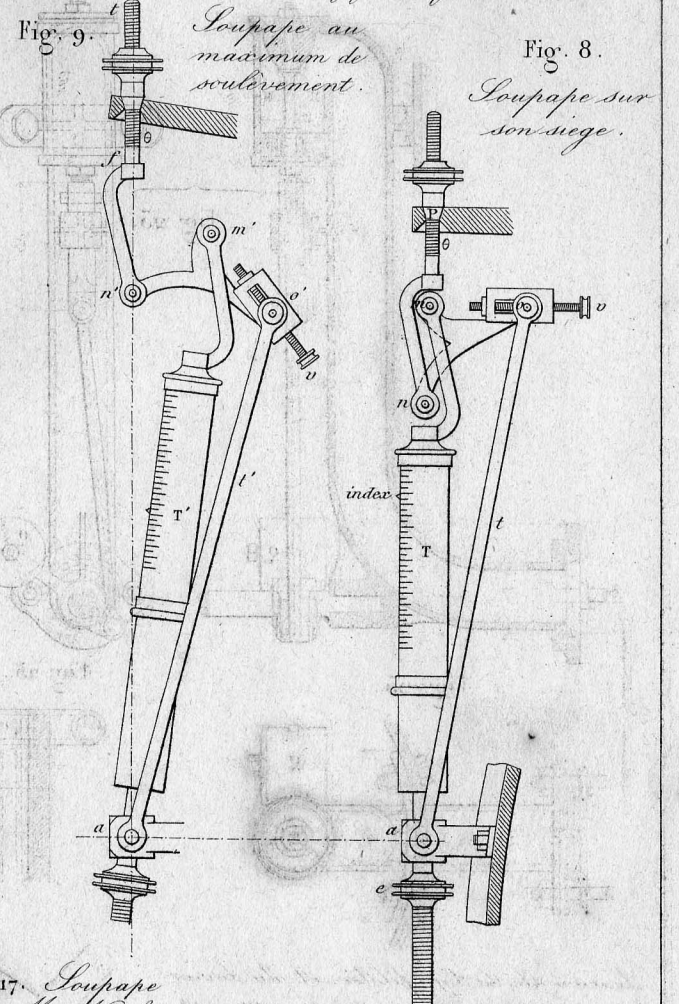
Manomètre Bourdon avec aiguille à maxima



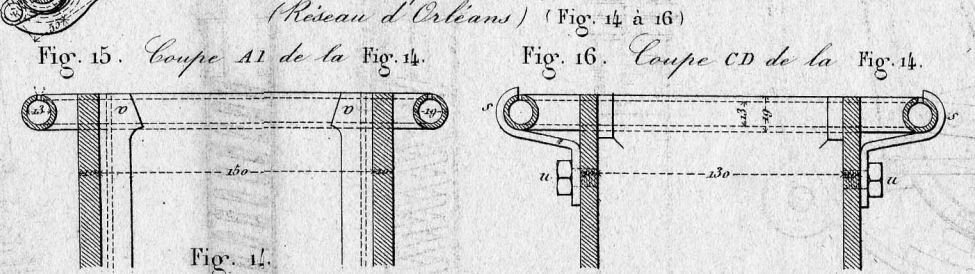
Soupape à échappement de M. M. Lecomte et Faltée (Fig. 5 à 7.)



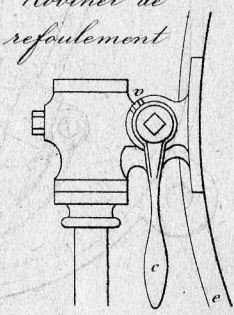
Soupape de M. Meggenhofen (Fig. 8 et 9.)



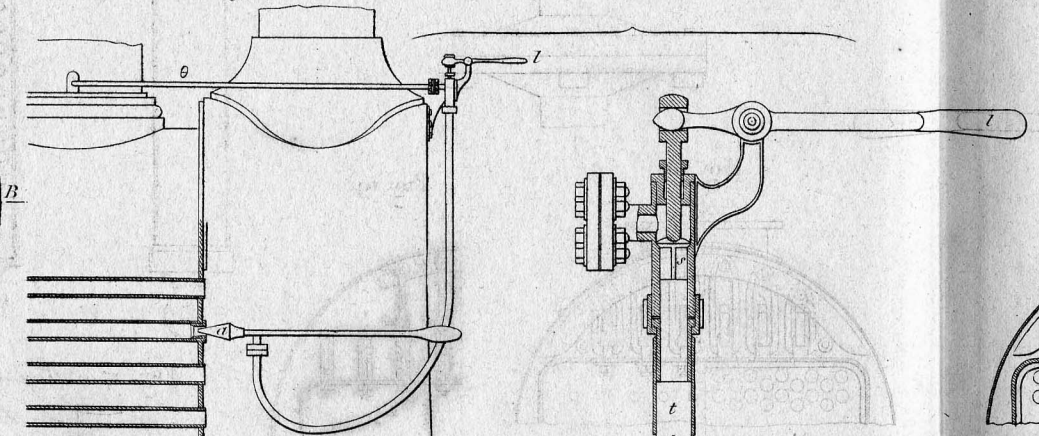
Souffleur annulaire à jets multiples (Réseau d'Orléans) (Fig. 14 à 16)



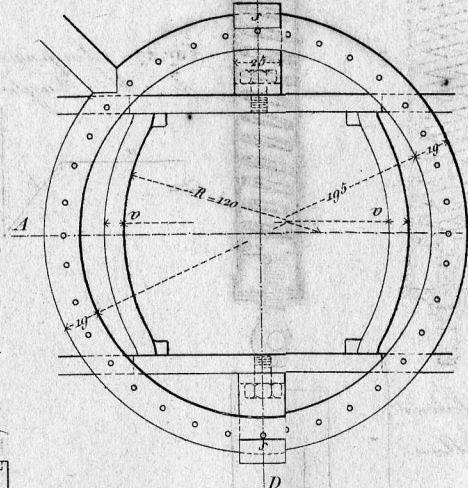
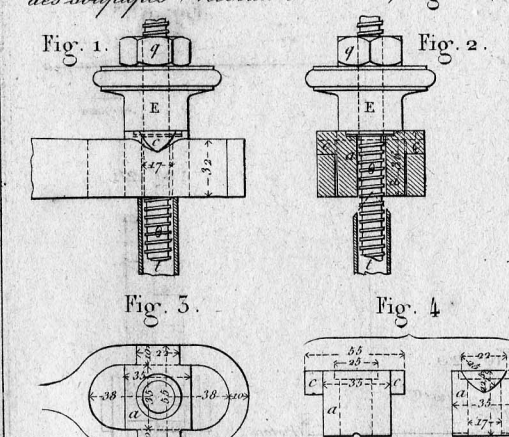
Robinet de refoulement



Nettoyage intérieur des tubes (Fig. 21)



Liaison de la tige filetée et du levier des soupapes (Réseau d'Orléans) (Fig. 1 à 4.)



Echelle de la Fig. 23 de 0<sup>m</sup> 01 pour 1 mètre

Echelle des Fig. 1 à 4, 14 à 16 et 18 et 19 de 0<sup>m</sup> 025 pour 1 mètre

Echelle des Fig. 10 à 13 et 27 de 0<sup>m</sup> 50 pour 1 mètre

Echelle de la Fig. 21 Ensemble de 0<sup>m</sup> 05 pour 1 mètre

Echelle des Fig. 5 à 9, 20, 21, 22 et 22 de 0<sup>m</sup> 20 pour 1 mètre

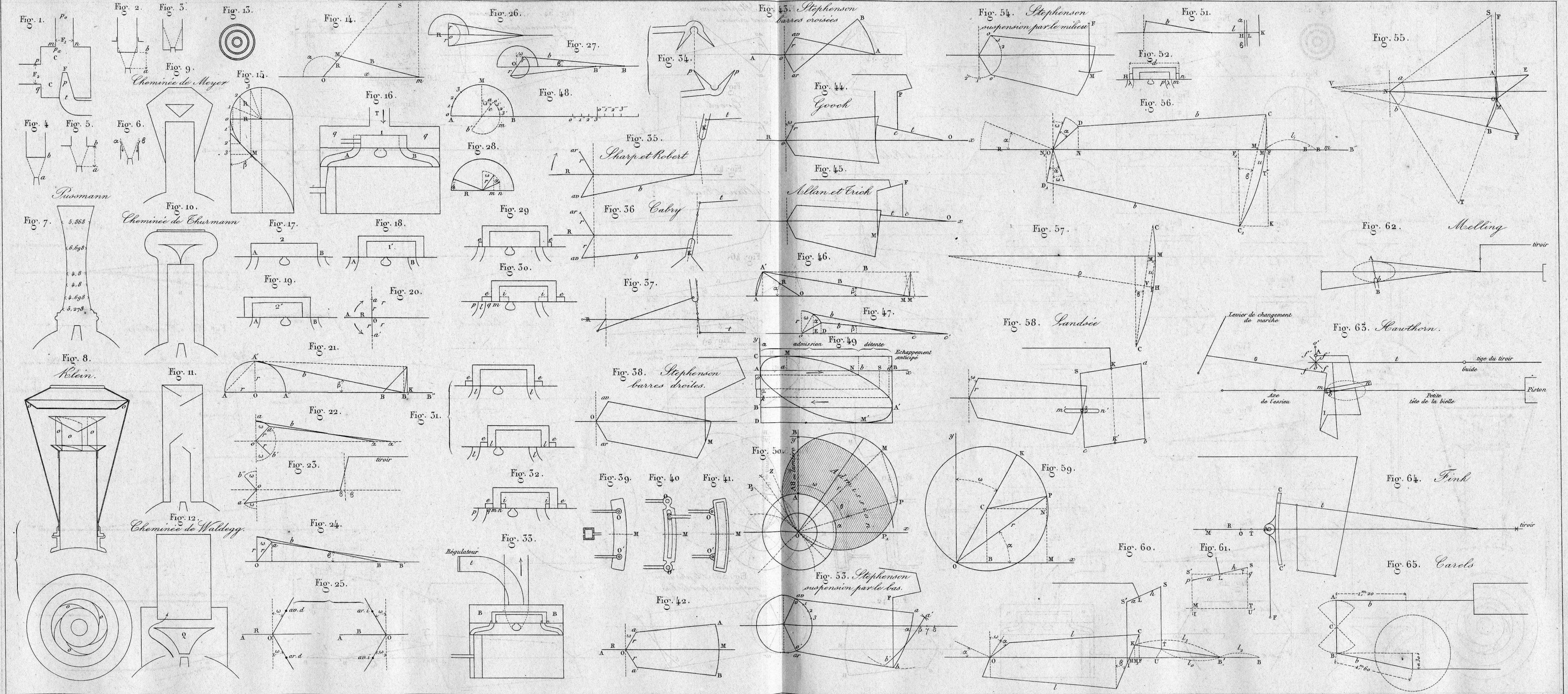


Fig. 1. *Circuits des machines de la Méditerranée Crampton.*

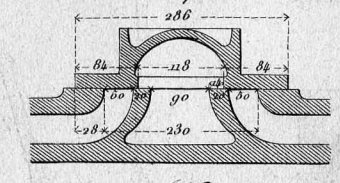


Fig. 2. *Voitures*

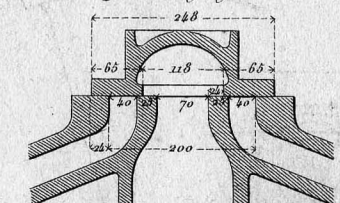


Fig. 3. *Mistes*

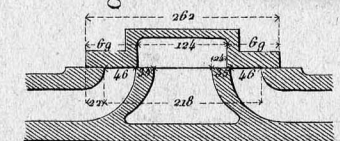


Fig. 4. *Marchandises*

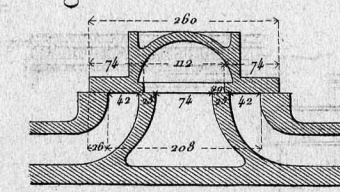


Fig. 12. *Détente Guinotte*

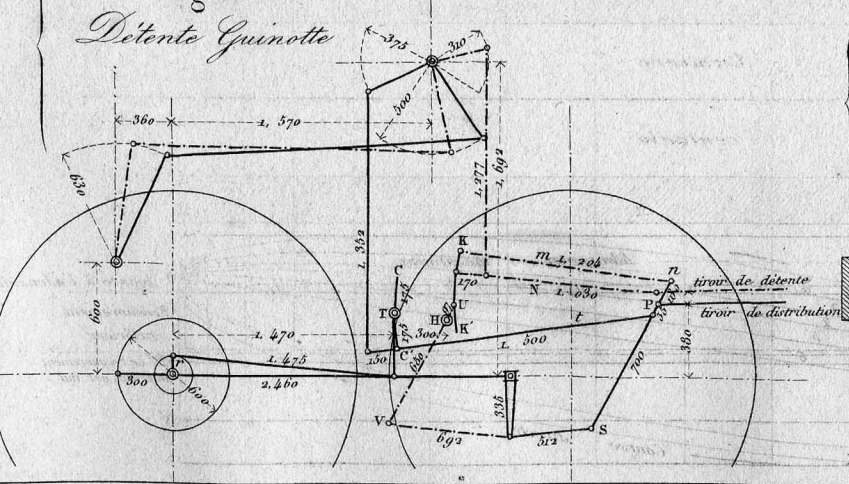
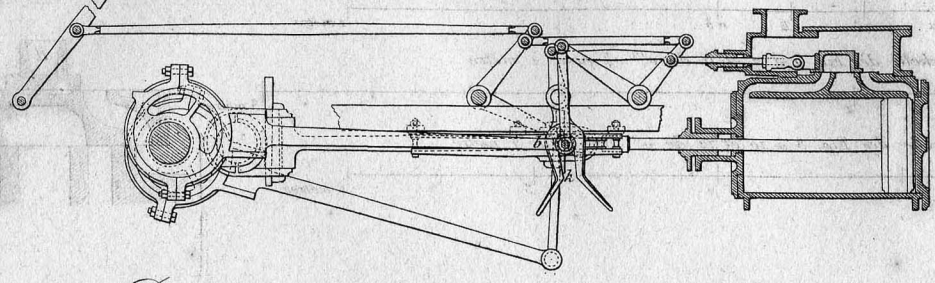
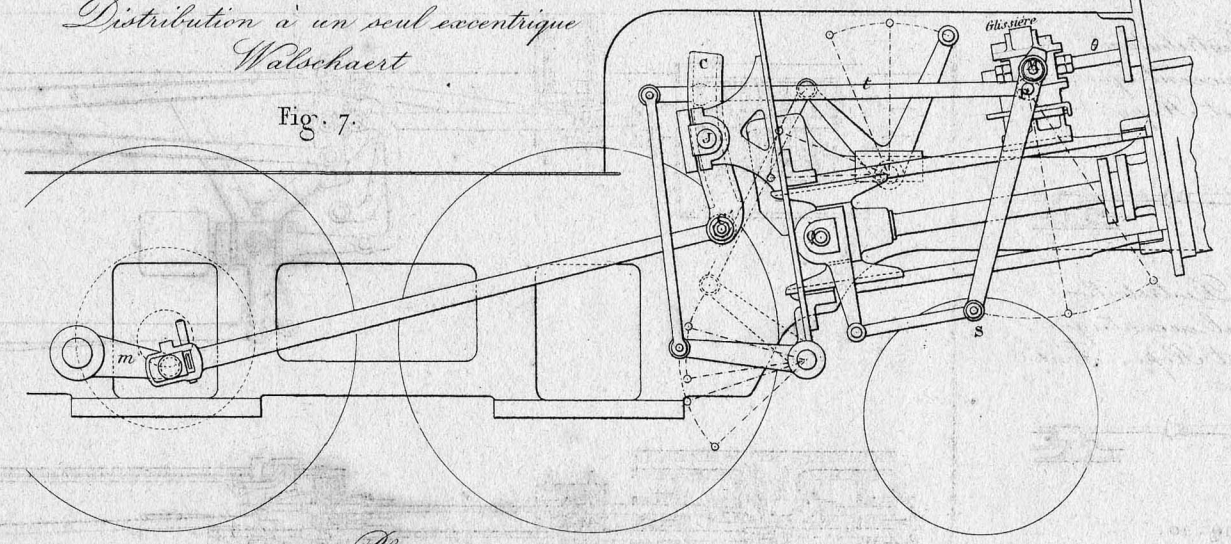


Fig. 5. *Distribution variable Calry.*



*Distribution à un seul excentrique Walschaert*

Fig. 7.



Plan

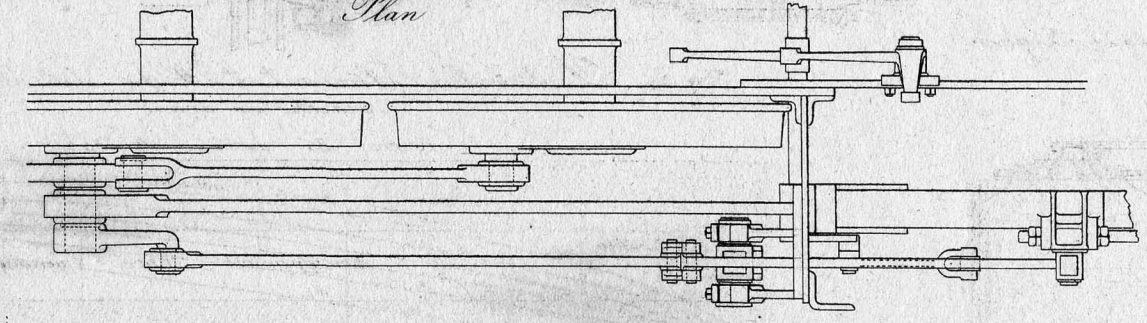


Fig. 6. *Distribution à un seul excentrique Fischer*

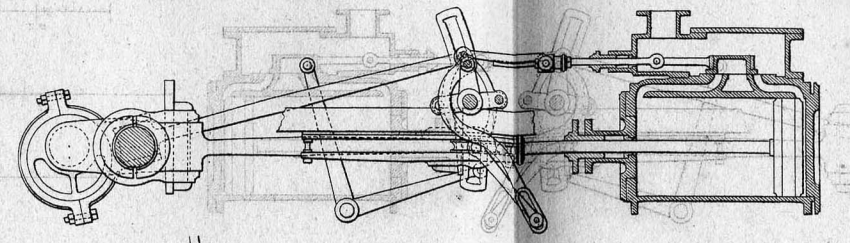


Fig. 9. *Distribution à un seul excentrique Stewart et Hope.*

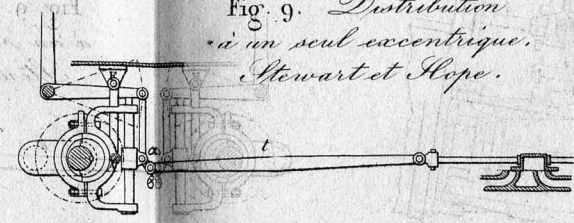


Fig. 8. *Distribution à un seul excentrique Stewart et Hope, Fink.*

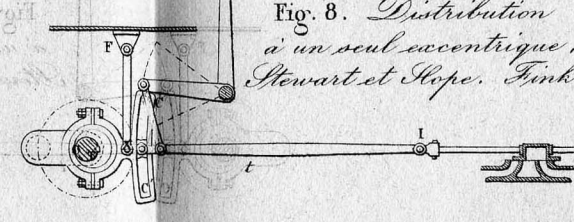


Fig. 10.

*Distribution sans excentriques Stewart.*

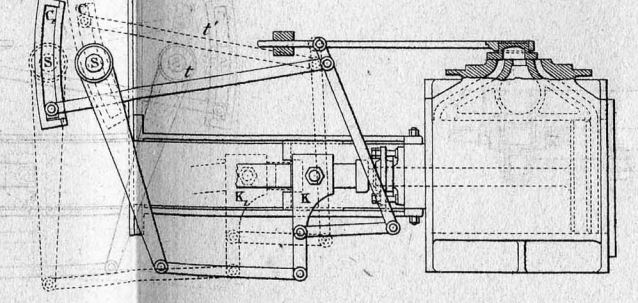
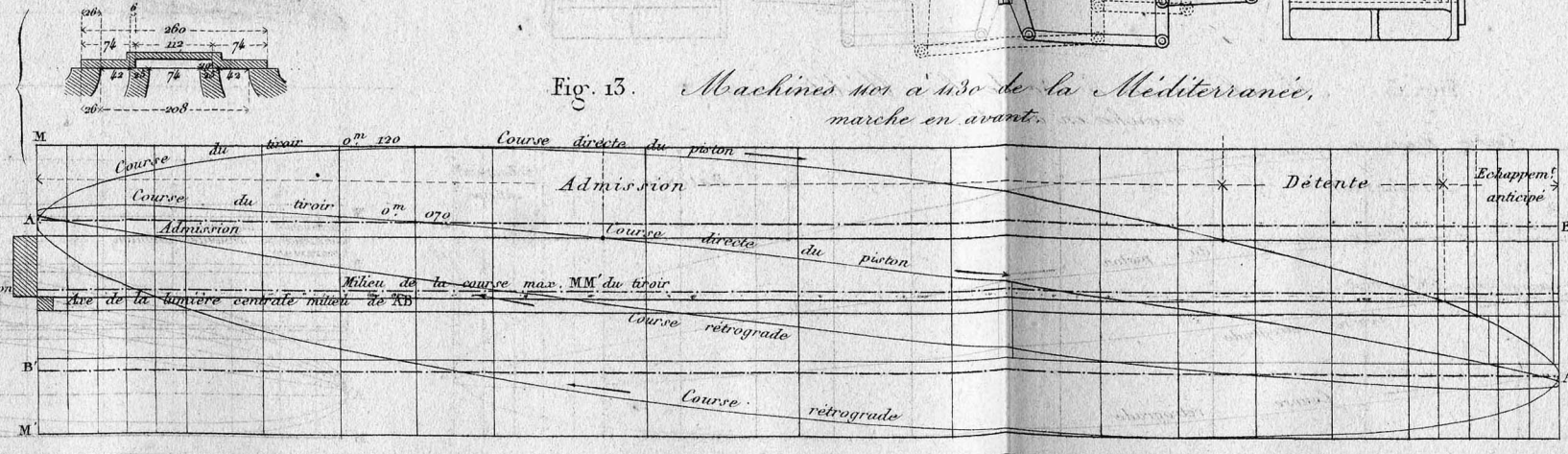


Fig. 13. *Machines nos 1 à 130 de la Méditerranée, marche en avant.*



Echelle des Fig. 1 à 4 et des tiroirs 6, 11 et 12 de 0<sup>m</sup> 10 pour 1 mètre

Echelle des Fig. 5 à 7 et 11 de 0<sup>m</sup> 04 pour 1 mètre

Echelle des Fig. 8 à 10 et 12 de 0<sup>m</sup> 025 pour 1 mètre

Fig. 11. *Détente à deux tiroirs Polonceau*

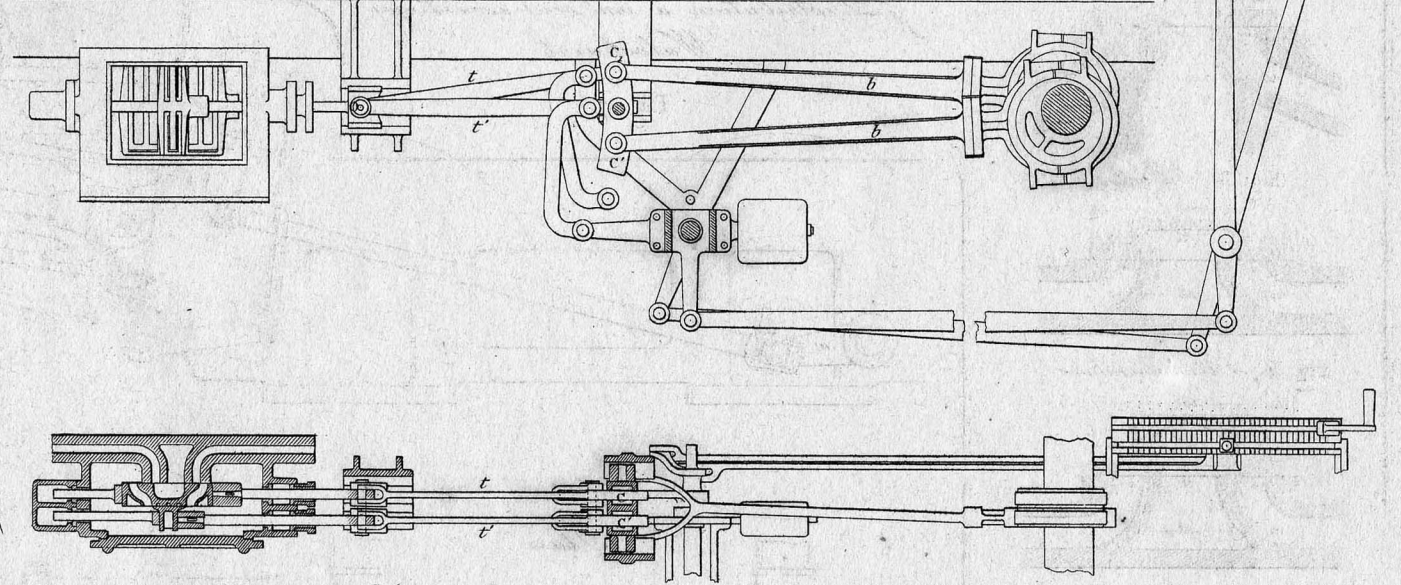
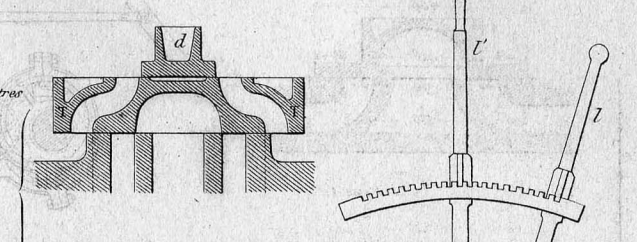


Fig. 14. *Distribution Stewart et Hope... (et Fink) (Voir Fig. 8.) marche en avant*

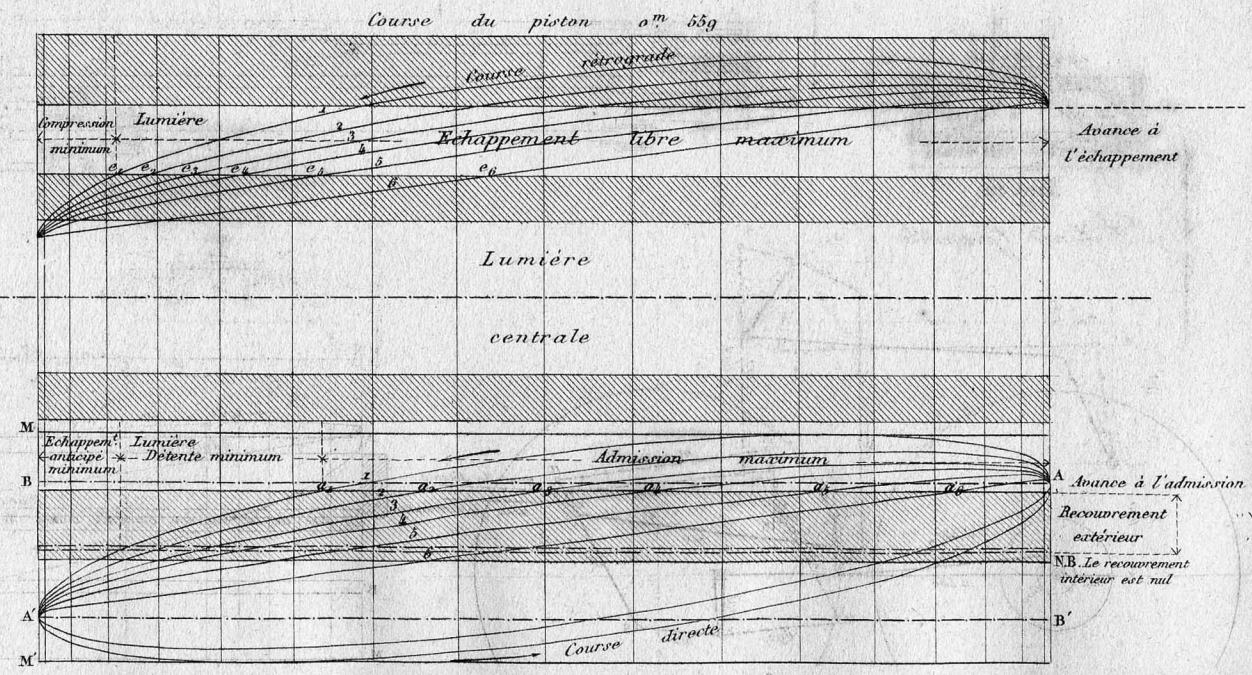




Fig. 1. Crani de M. Zeuner.

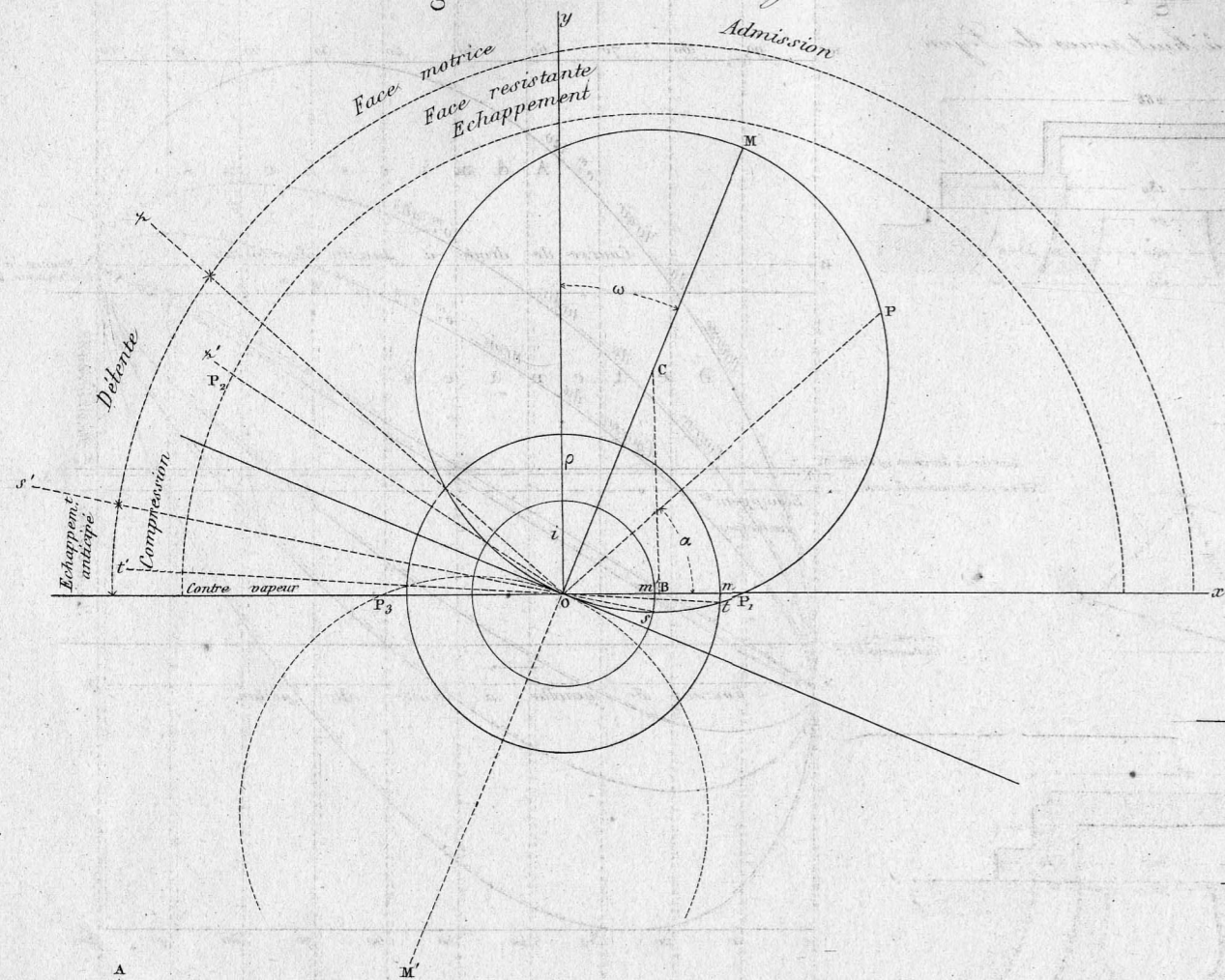


Fig. 2.

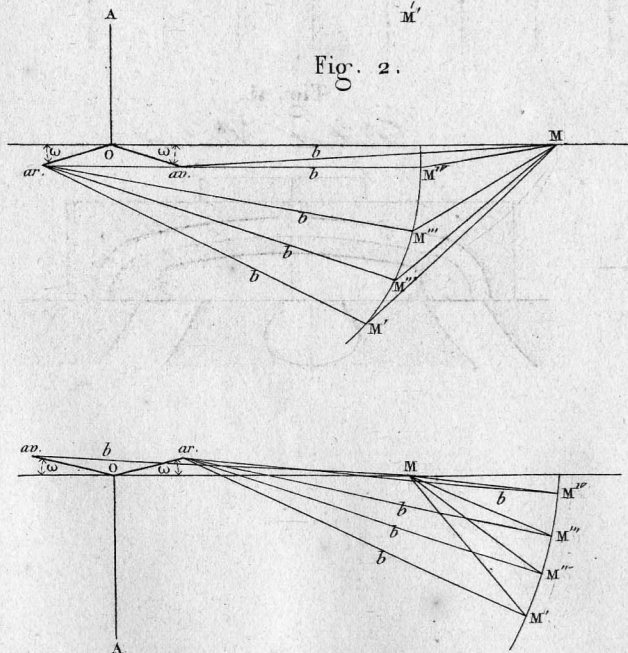


Fig. 8.

Détente Gonzenbach

coulisse

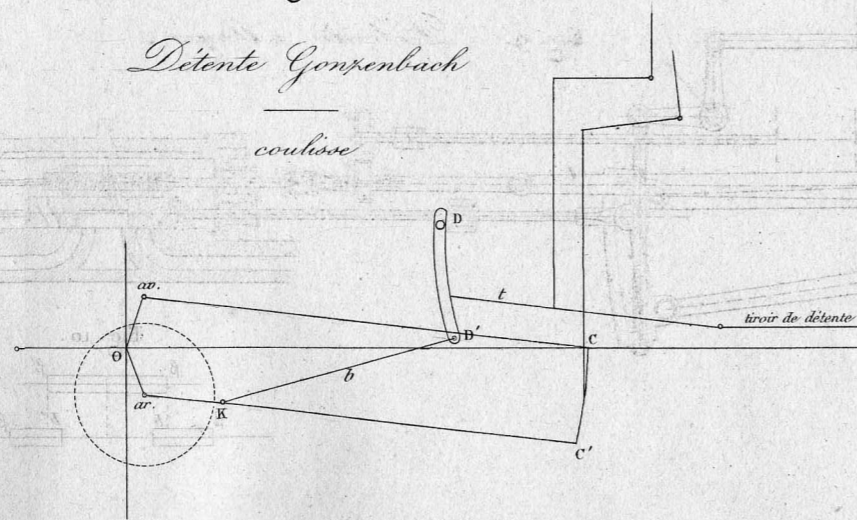


Fig. 3.

Distribution à un seul excentrique  
H. de Waldegg.

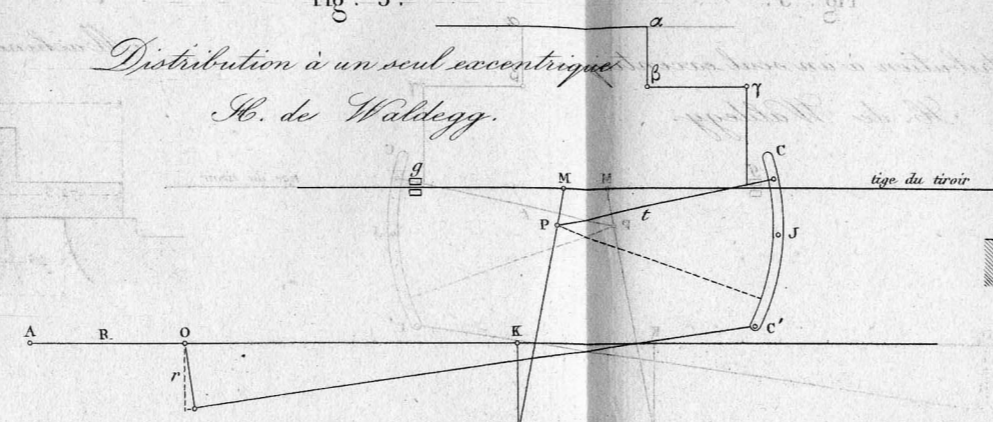


Fig. 6. Détente Gonzenbach. — (machine Veloce.)

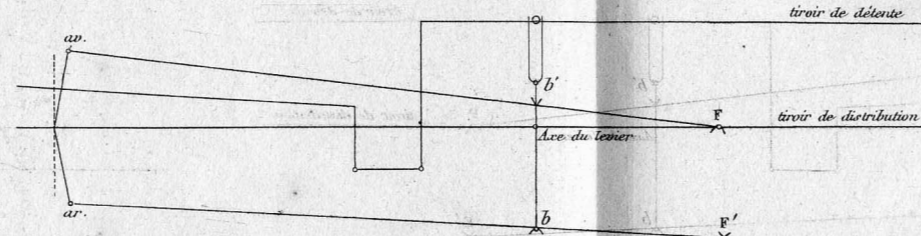


Fig. 7. Détente Gonzenbach. — (machine Hercule.)

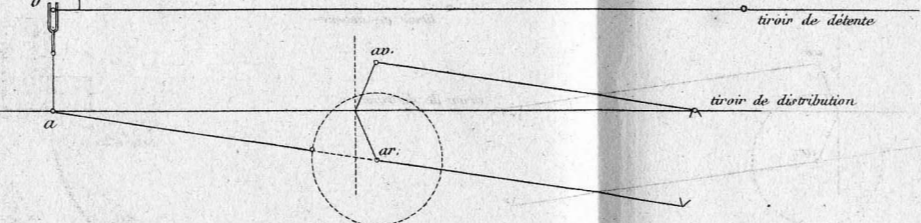


Fig. 4.

Machine à huit roues de Lyon.

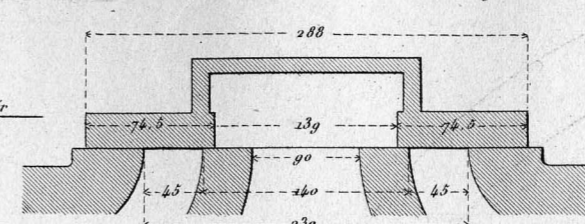


Fig. 12.

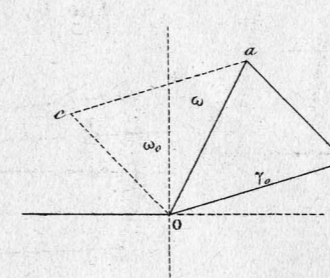


Fig. 9. Détente Meyer.

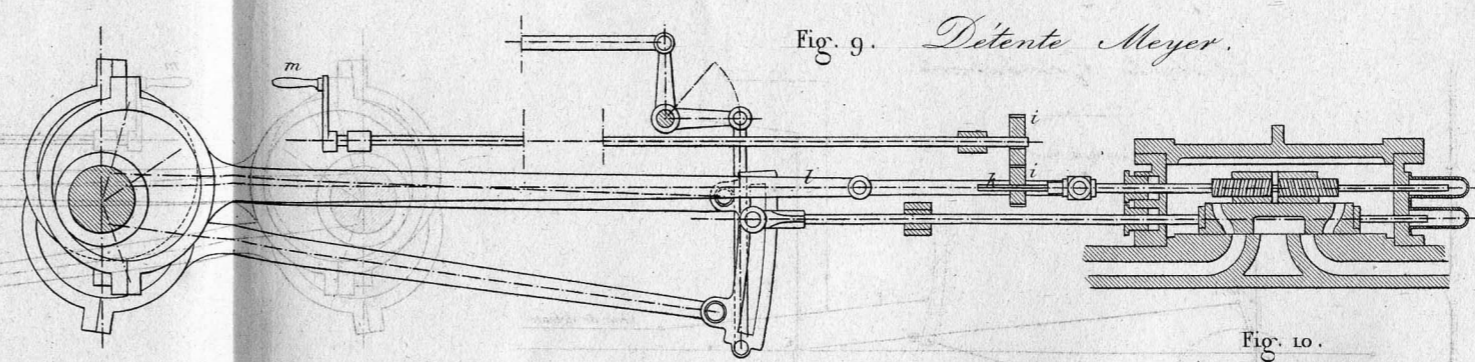


Fig. 10.

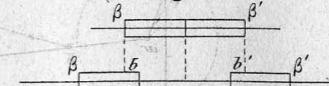


Fig. 5. Distribution Gooch.

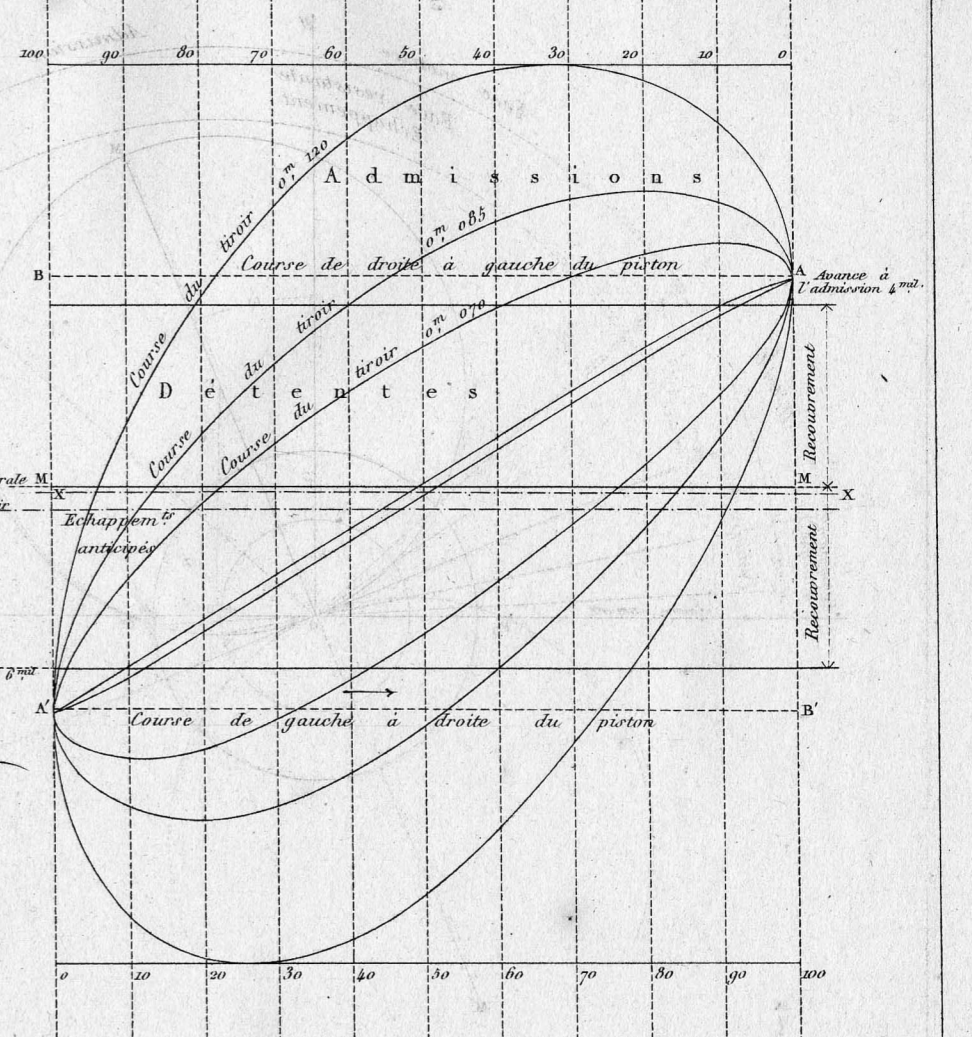
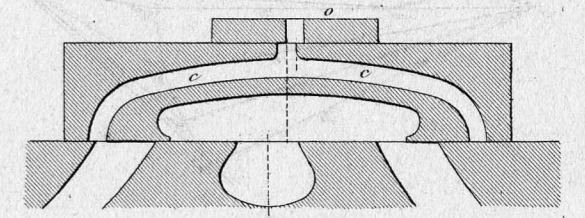


Fig. 11.

Détente Bréval



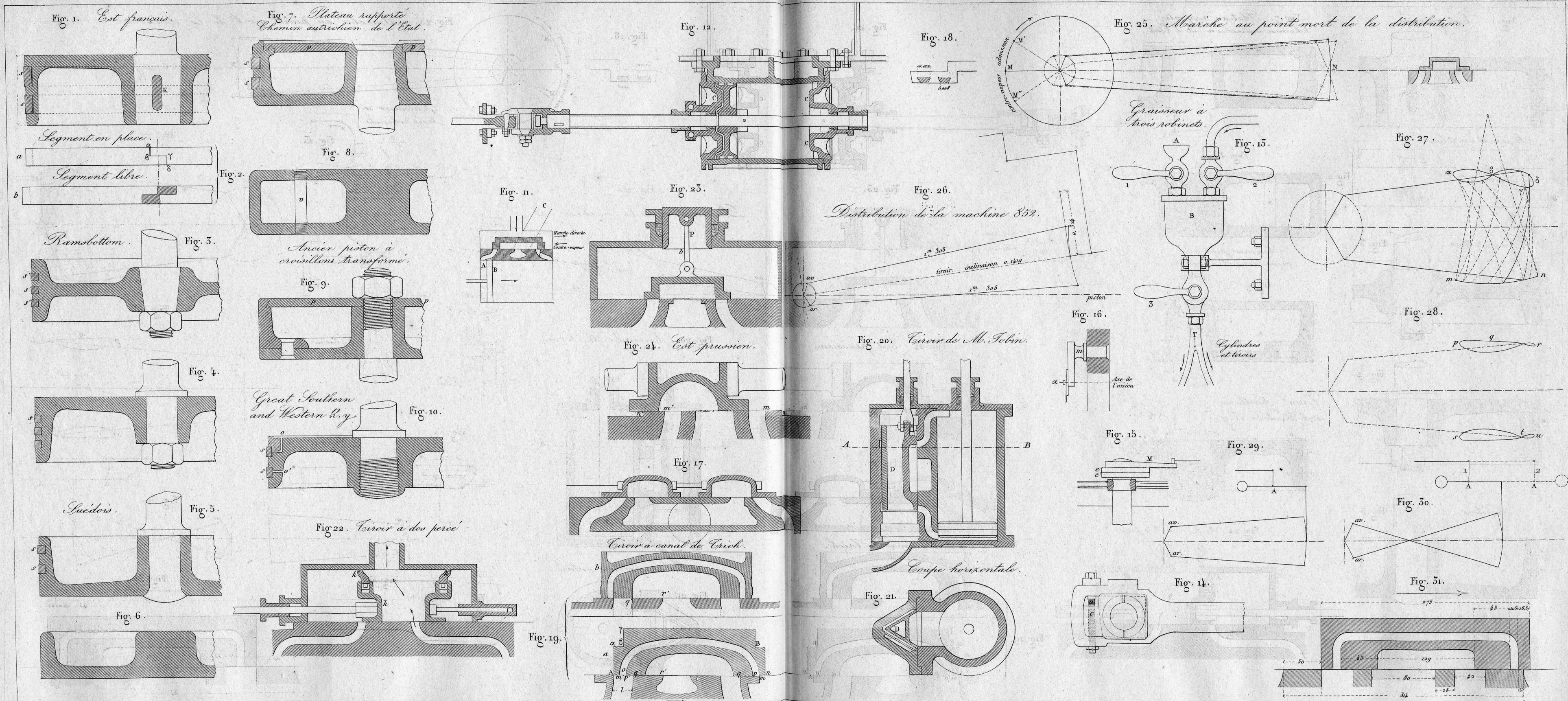


Fig. 1. Machine 852 d'Orléans. Marche en avant au point mort.

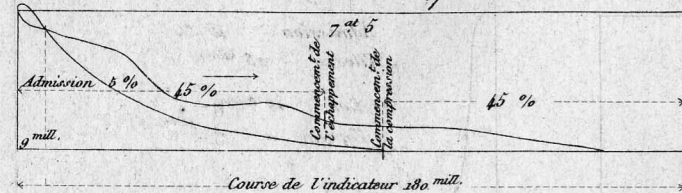


Fig. 2. Machine 852, Efforts théoriques sur les pistons aux diverses admissions en avant.

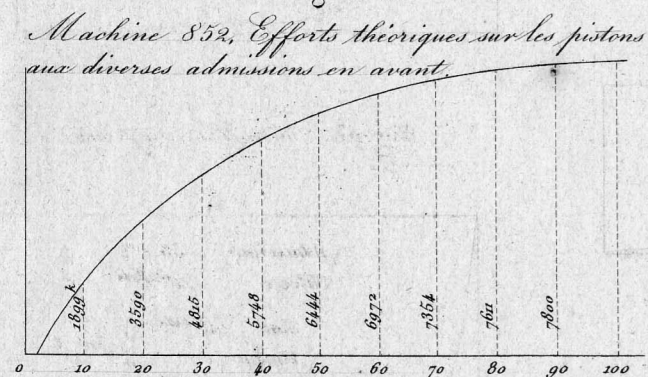


Fig. 3. Machine 17. Roues libres. Diagrammes relevés aux divers crans de la marche en avant. Limite (8 at. 7 1/2)

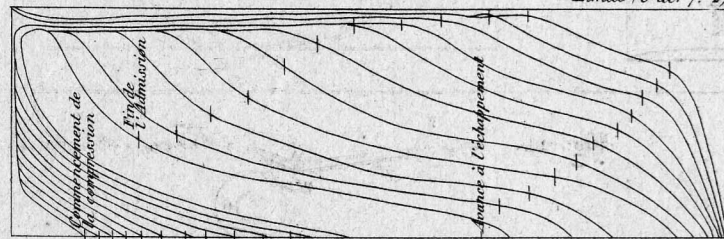


Fig. 4. Machine 917. Distribution mise au point mort. Marche-avant. (Machine tirant.)

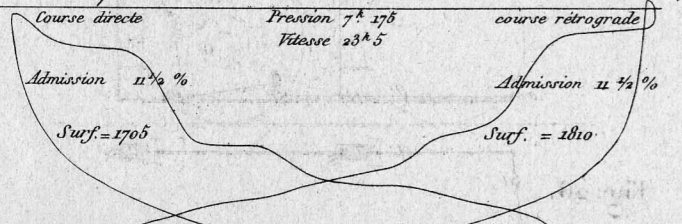


Fig. 5. Machine 917. Distribution mise au point mort en marche-arrière. (Machine reboulant.)

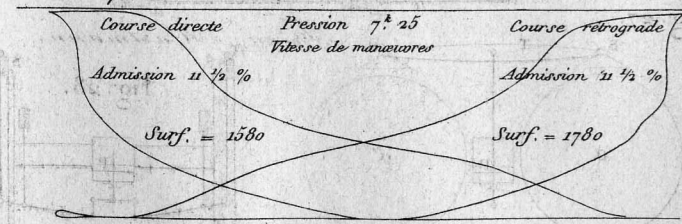


Fig. 6. Machine 917. Palier. Marche-avant. Distribution mise au cran 10 arrière.

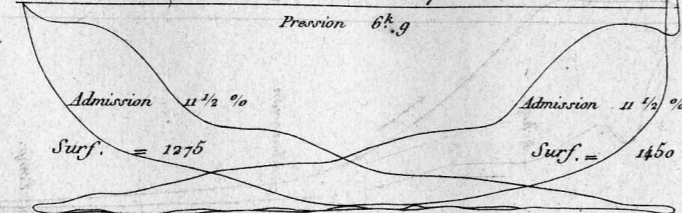


Fig. 7. Machine 917. Palier. Marche-avant. Distribution mise au cran 10 arrière.

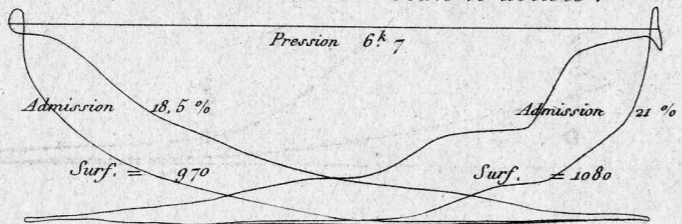


Fig. 8. Machine 917. Palier. Marche-avant. Distribution mise au cran 15 arrière.

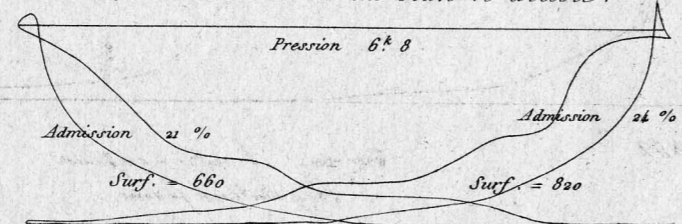


Fig. 9. Machine 917. Palier. Marche-avant. Distribution mise au cran 20 arrière.

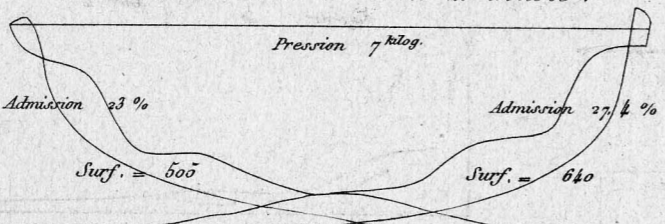


Fig. 10. Machine 917. Palier. Marche-avant. Distribution mise au cran 25 arrière.

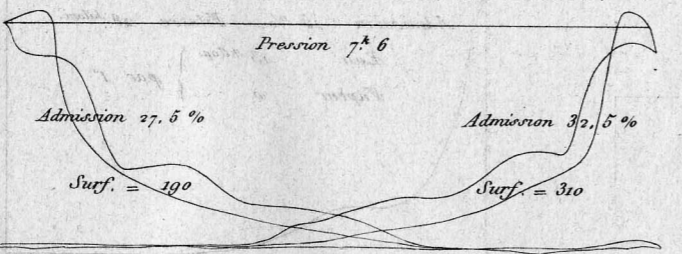


Fig. 11. Machine 917. Palier. Marche-avant. Distribution mise au cran 30 arrière.

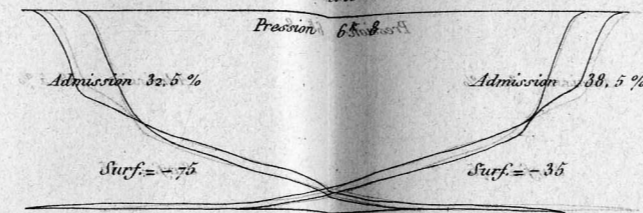


Fig. 12. Vapeur motrice. Admission 58%. Vitesse 18 kilom.

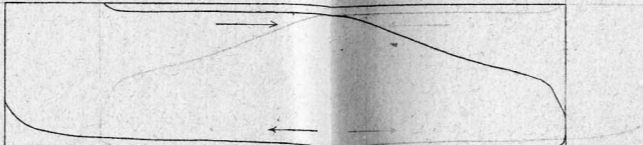


Fig. 13. Contre-vapeur. Admission 58%. Vitesse 28 kilom. Injection d'eau.



Fig. 14 à 19 diagrammes relevés sur la machine 852 injection d'eau et de vapeur, solidaires.

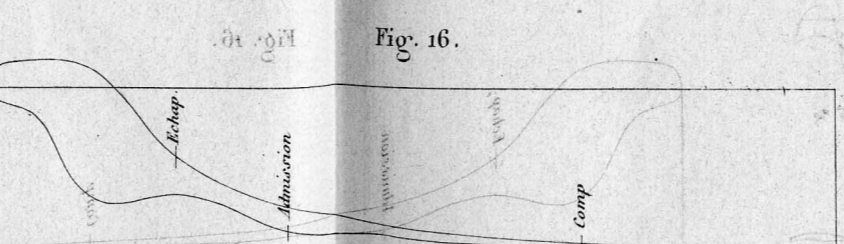
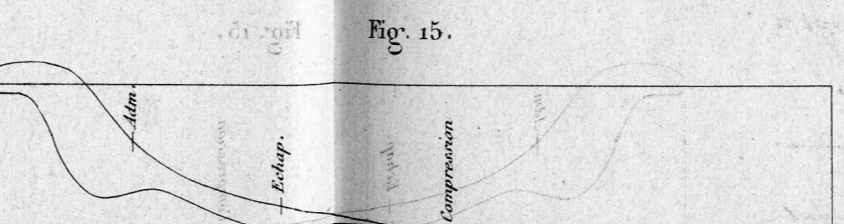
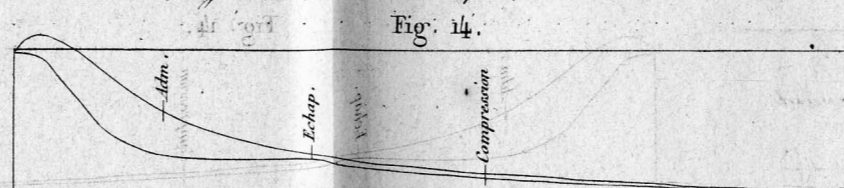


Fig. 17.

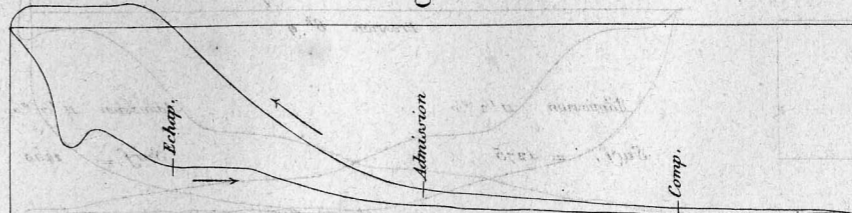


Fig. 18.

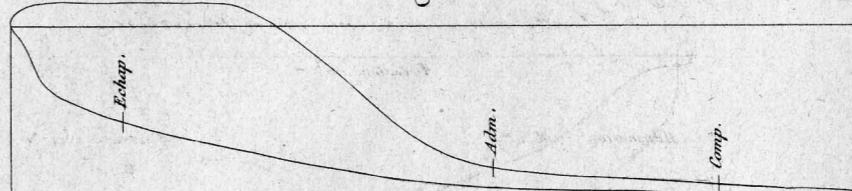


Fig. 19.

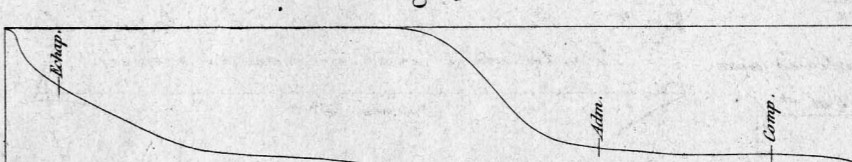


Fig. 20. Contre-vapeur. Régulateur fermé.

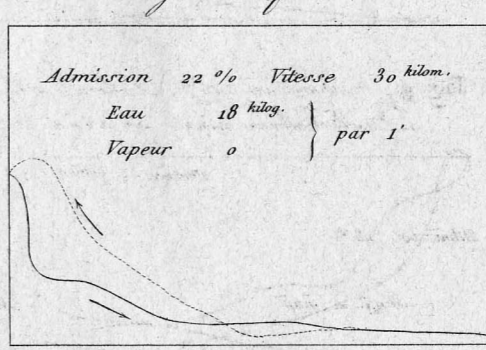


Fig. 21. Contre-vapeur. Régulateur ouvert.

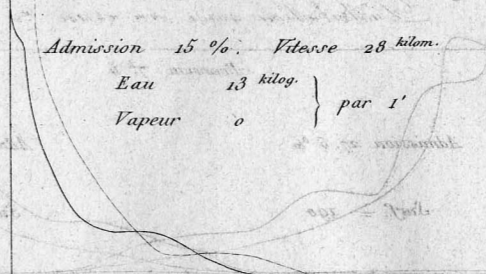


Fig. 22. Contre-vapeur. Admission 45%. Vitesse 28 kilom. Eau 18 kilog. Vapeur 0 par l'.

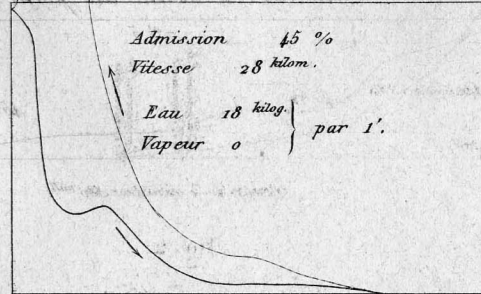


Fig. 23. Contre-vapeur. Admission 58%. Vitesse 28 kilom. Eau 18 kilog. Vapeur 0 par l'.

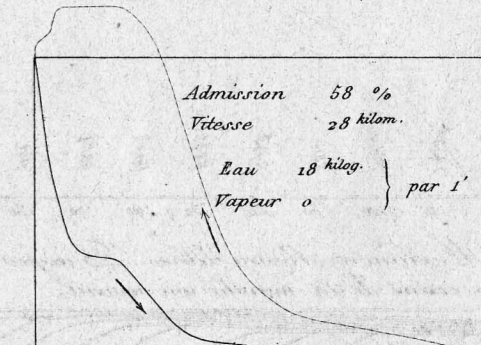


Fig. 24. Frein Heberlein.



Fig. 25. Machine de la Société de Berlin.

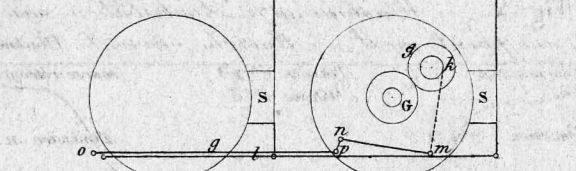


Fig. 26.

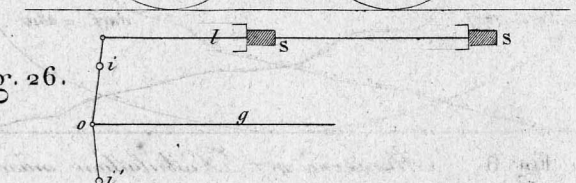


Fig. 27. Frein Hartmann.

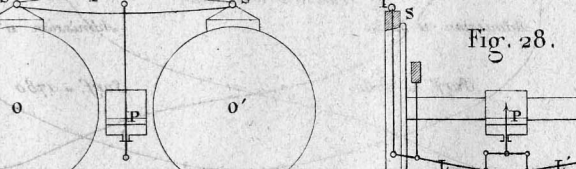


Fig. 28.

C. COUCHE. Chemins de Fer.

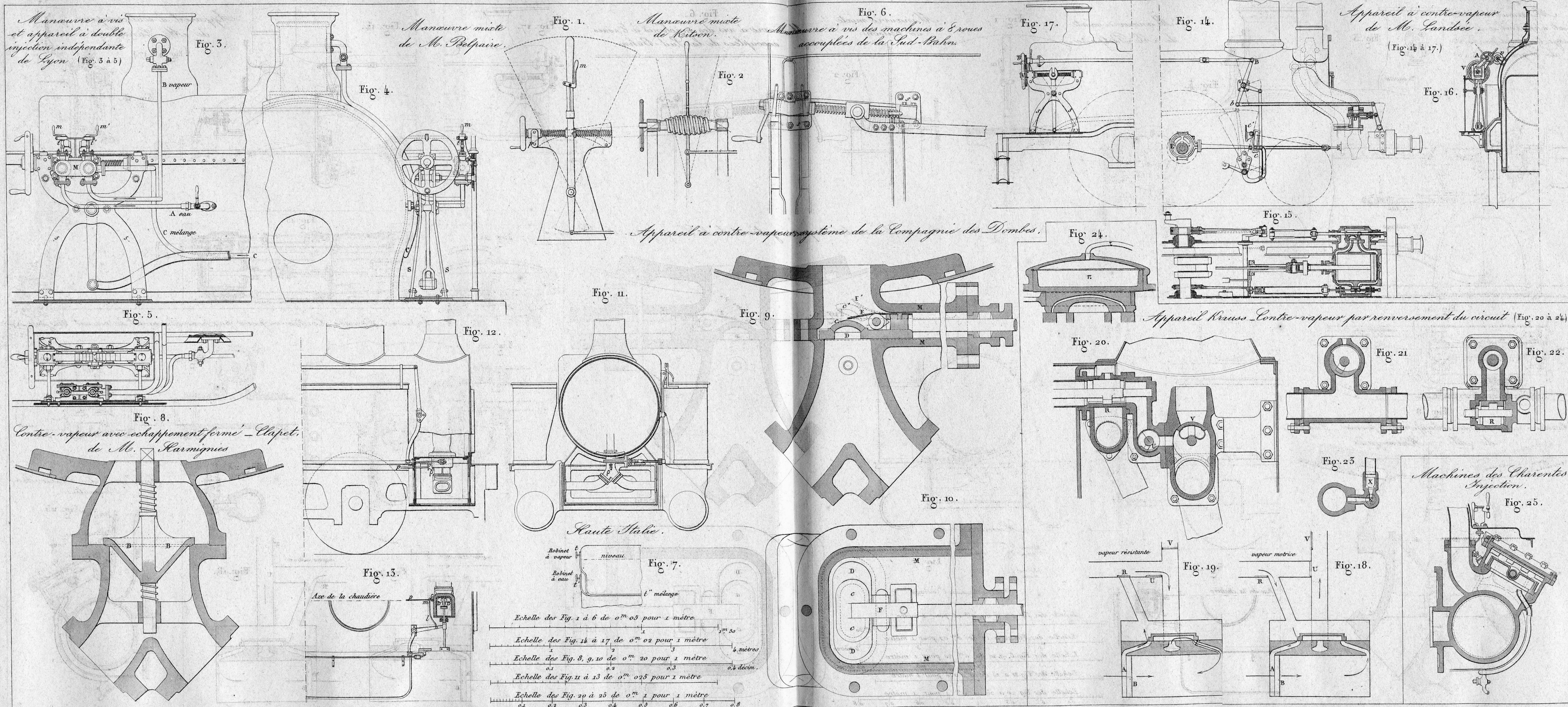


Fig. 1.

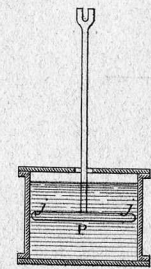


Fig. 5.

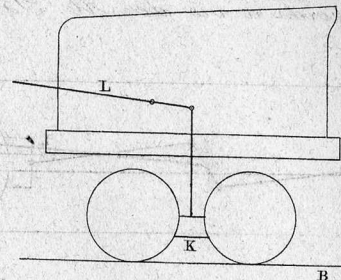


Fig. 10.

Frein à cabestan de Cologne à Minden.

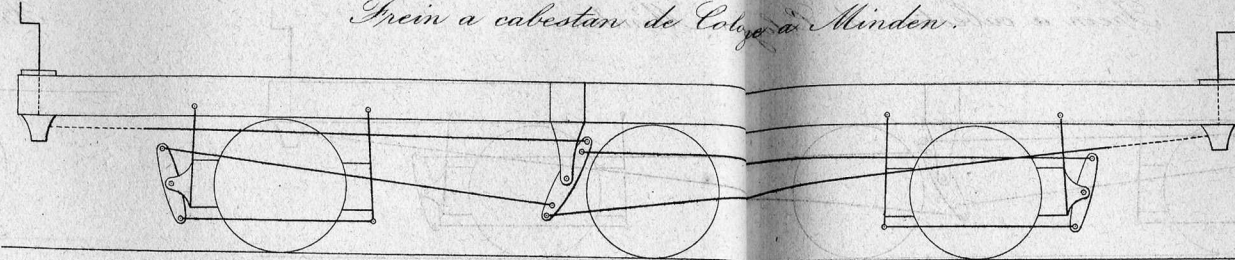


Fig. 11.

Frein à contrepoids à vis de M. Bricogne.

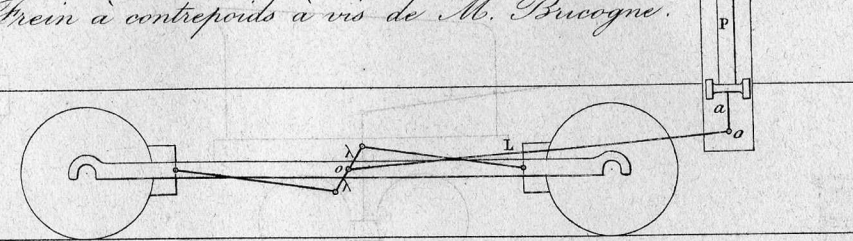


Fig. 2.

Frein de la machine Steierdorf.

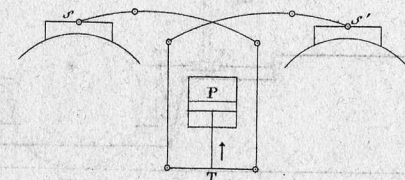


Fig. 6.

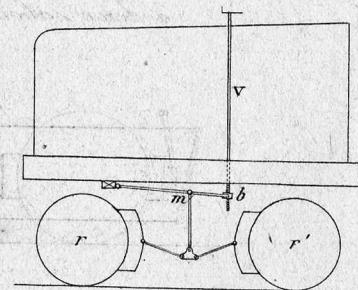


Fig. 15.

Frein Laignel.

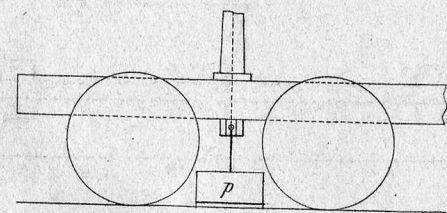


Fig. 12.

Frein à contrepoids et à vis de M. Bricogne.

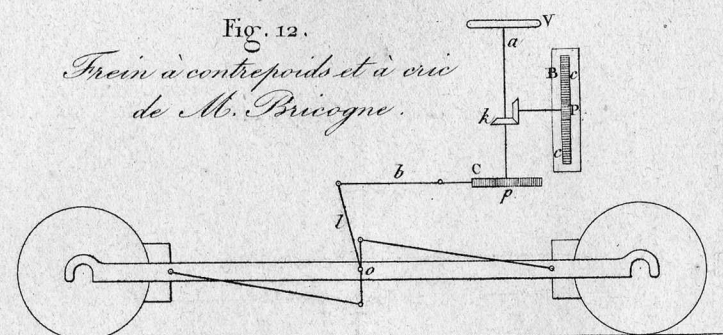


Fig. 13.

Frein de M. Bricogne à deux sabots sur chaque roue.

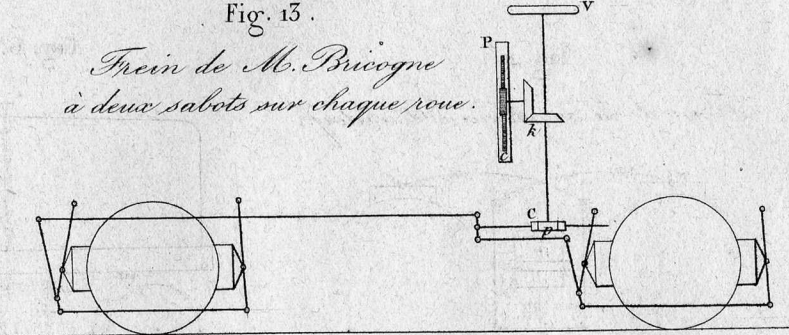


Fig. 7. Frein à entraînement de M. Courasse.

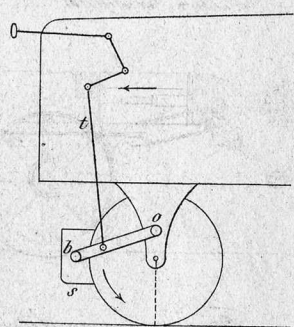


Fig. 17.

Frein automoteur de M. Guérin.

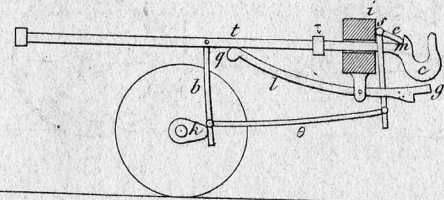


Fig. 18.

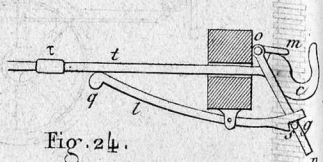


Fig. 20.

Frein du North-London.

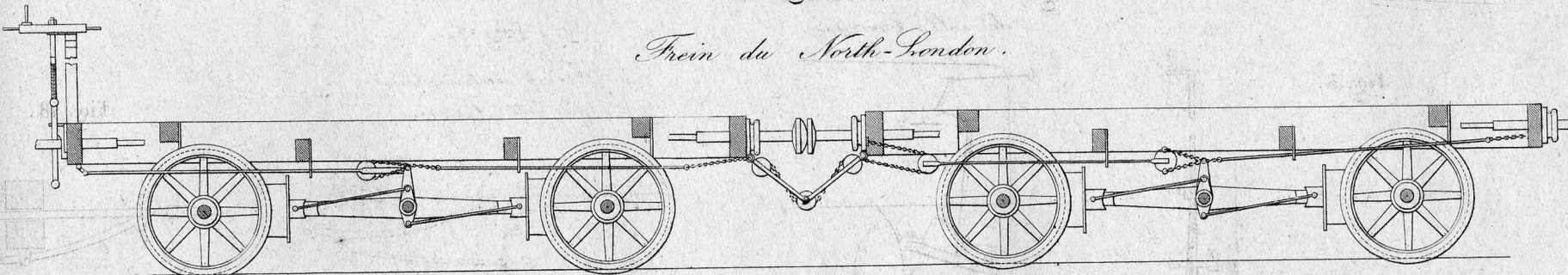


Fig. 3.

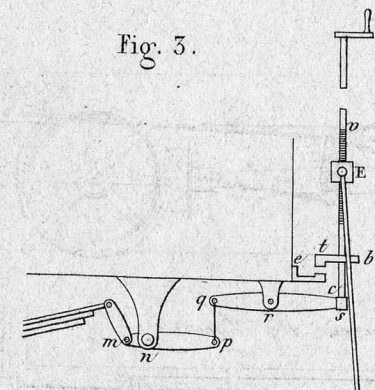


Fig. 14.

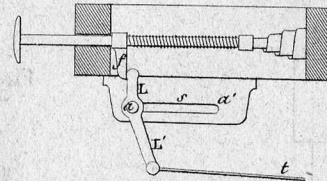


Fig. 9.

Frein des voitures à six roues de Lyon.

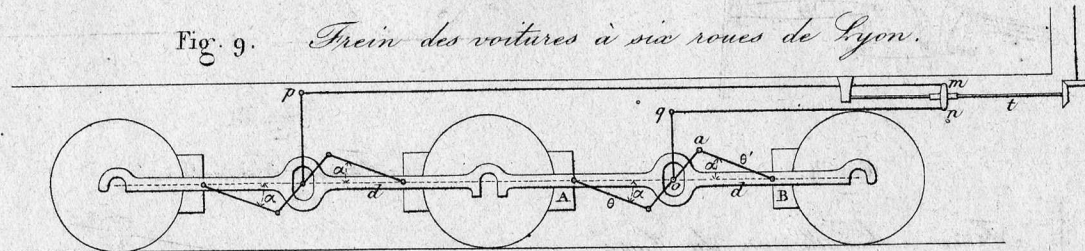


Fig. 8.

Frein Cabuteau.

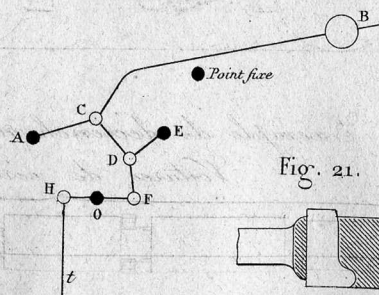


Fig. 19.

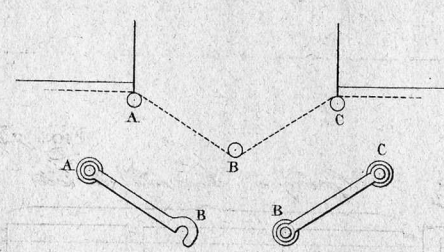


Fig. 22.

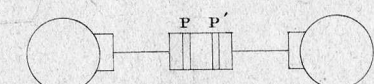


Fig. 23.

Exemple de déclenchement à distance.

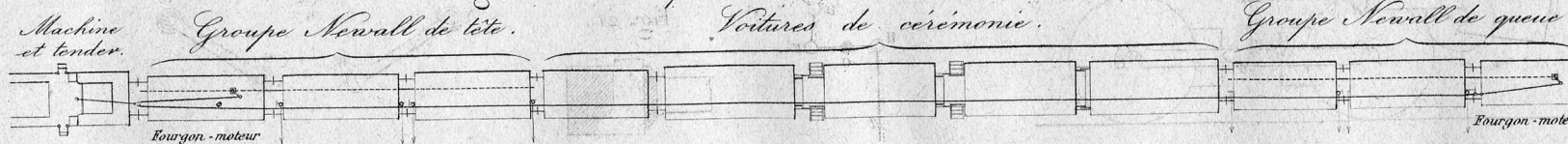


Fig. 4.

Frein Nosedu ou du Curé.

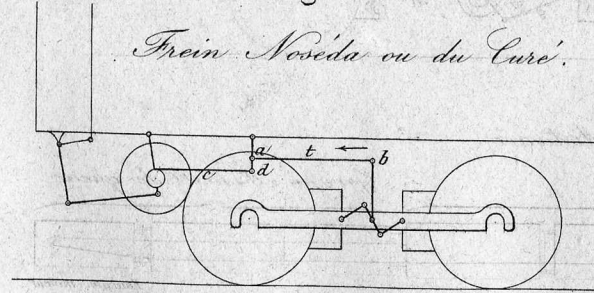
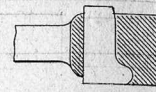


Fig. 21.



Freins des machines de l'Ouest français. (Fig. 1 à 6.)

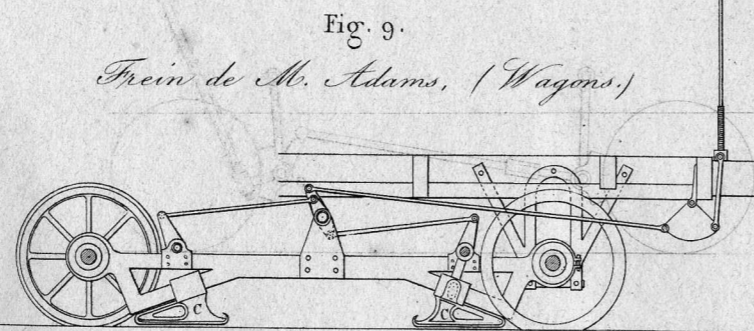
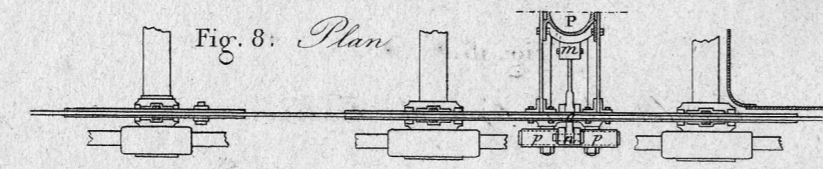
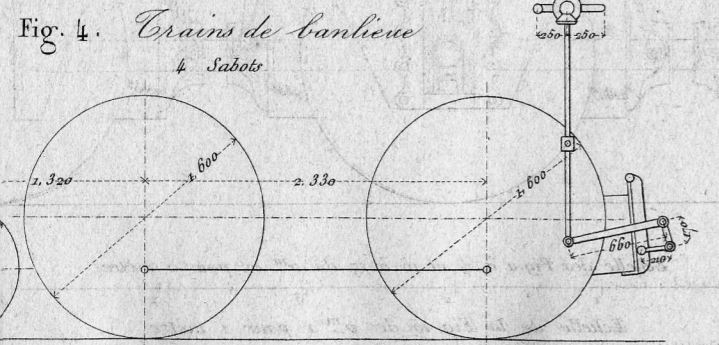
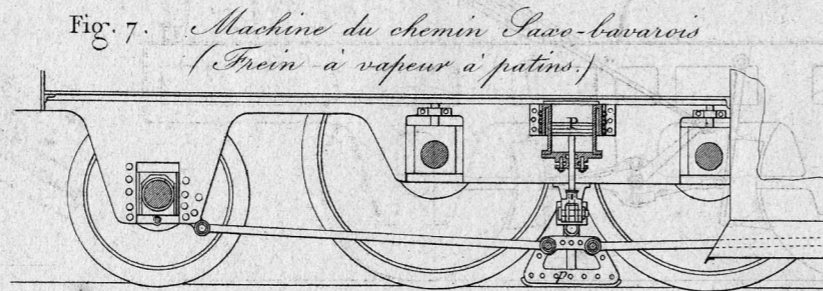
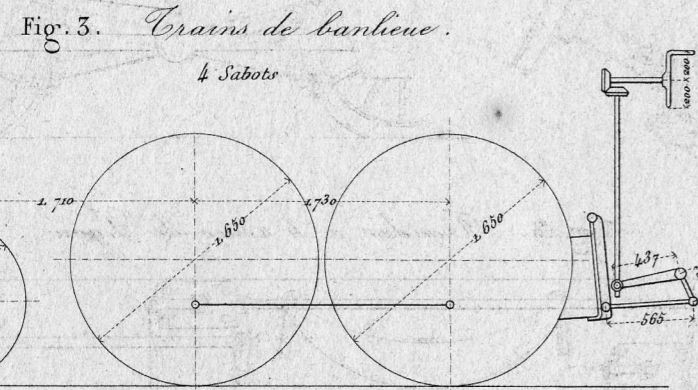
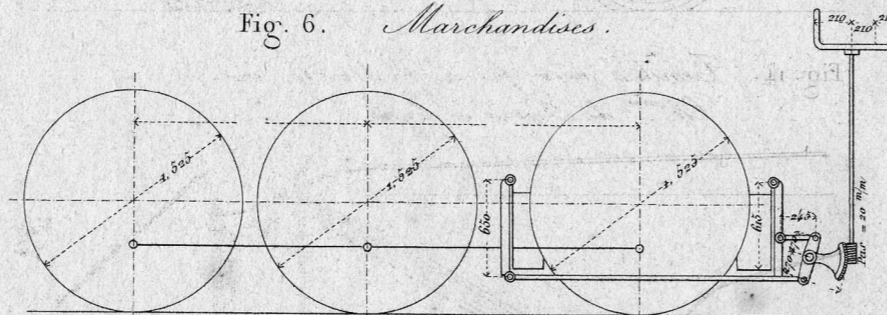
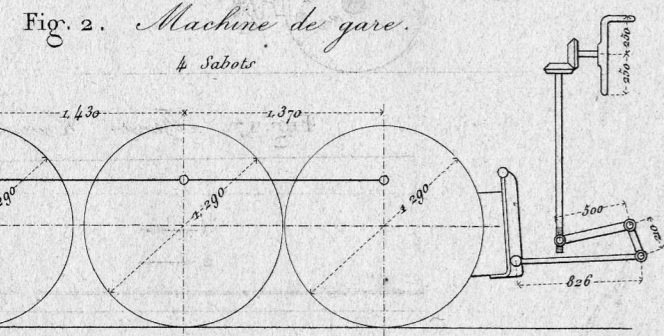
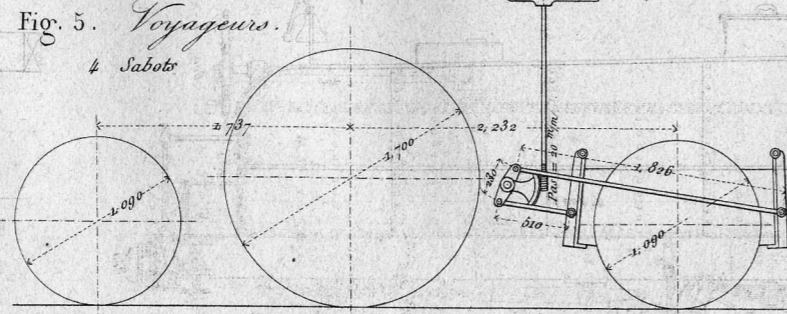
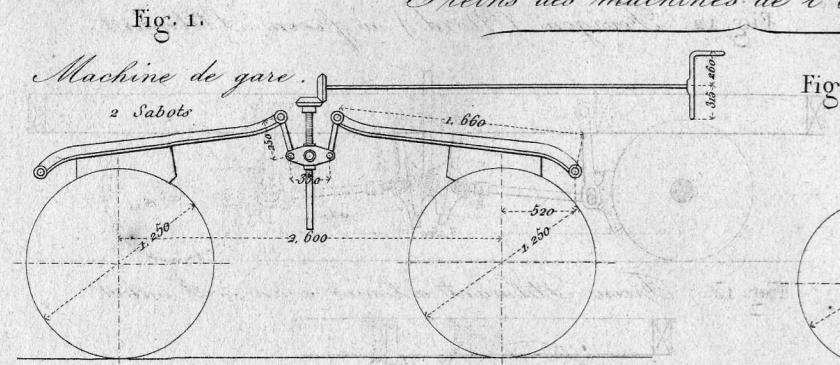


Fig. 10.

Fig. 11. Tender à frein Stilmant à vis.

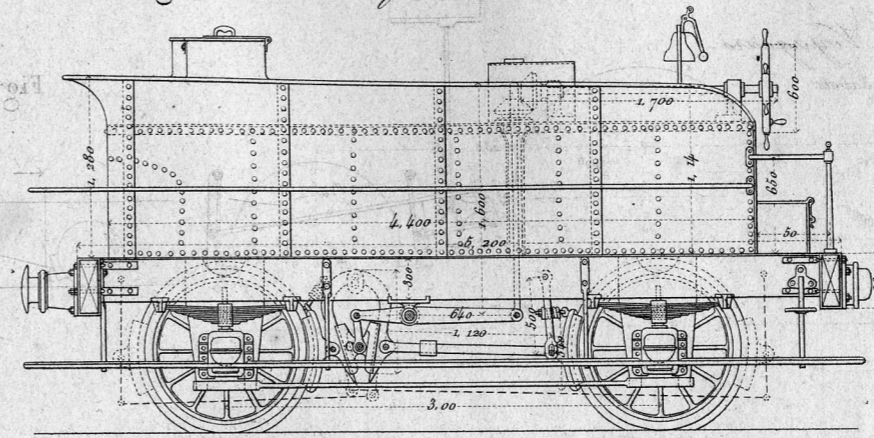


Fig. 12. Fourgon (Nord) à frein Stilmant.

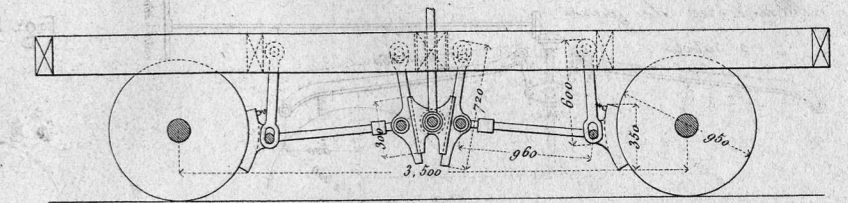


Fig. 14. Tender avec frein à double vis. Chemin de Paris à Lyon.

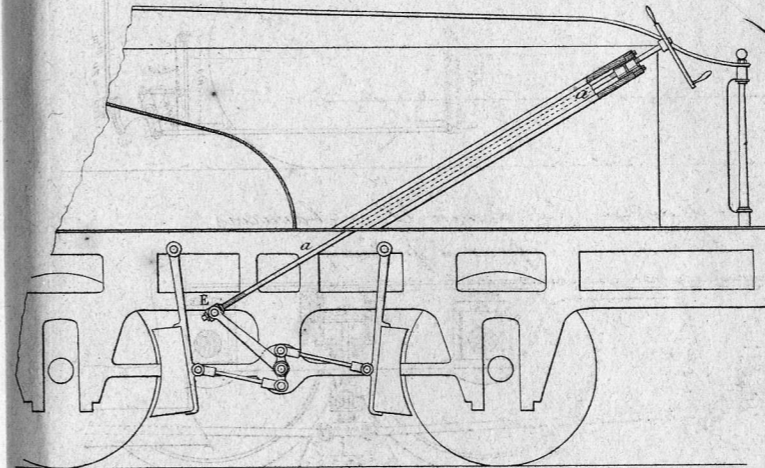


Fig. 15. Frein Stilmant à levier à un seul sabot.

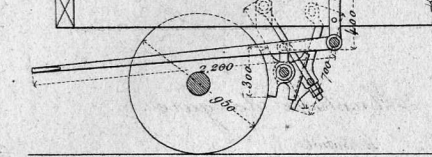


Fig. 17. Frein Courasse.

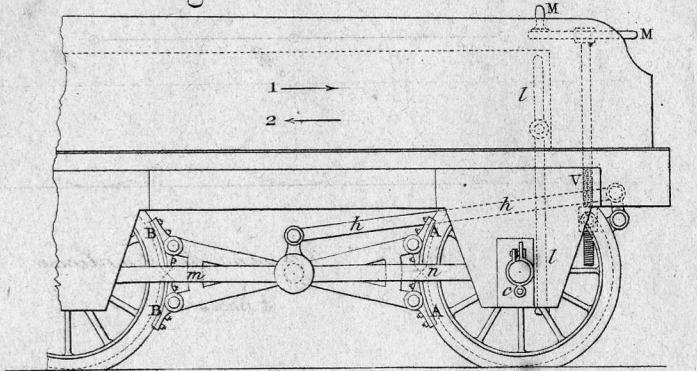


Fig. 16.

Tender de la ligne de Cubize.

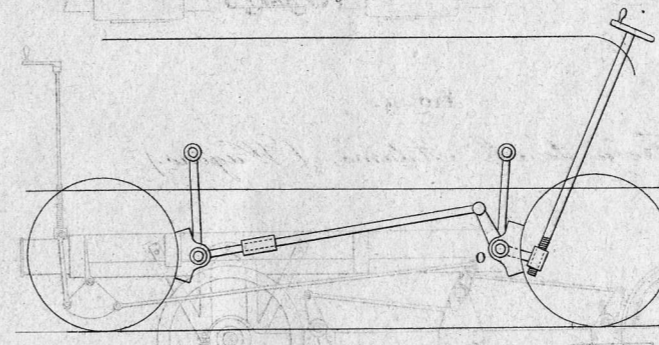
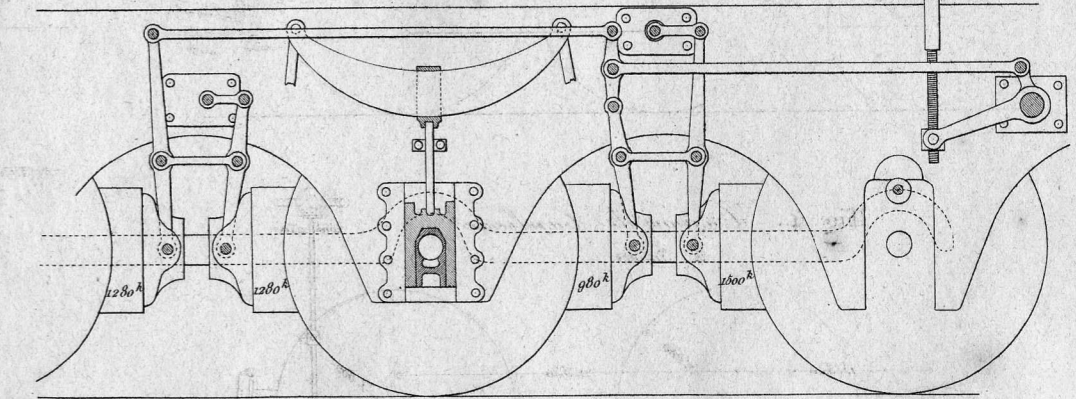


Fig. 18. Tender à 6 roues de Lyon.

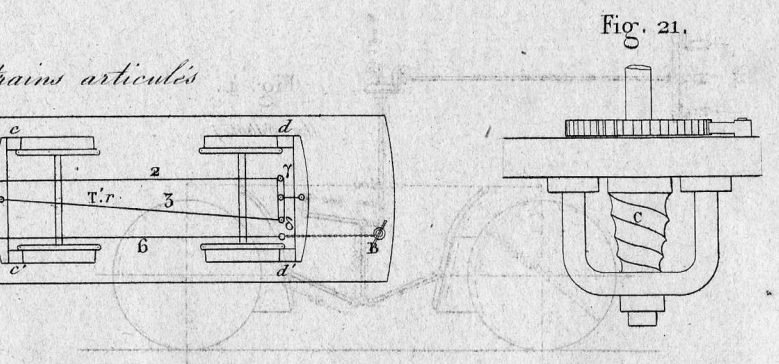
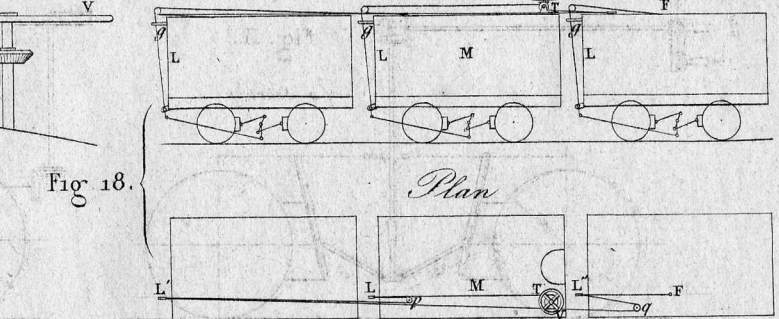
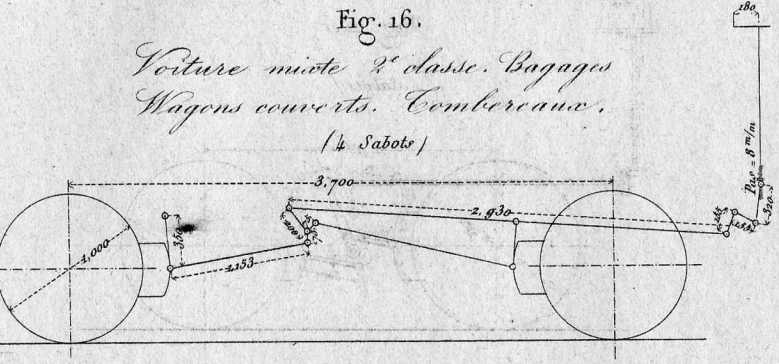
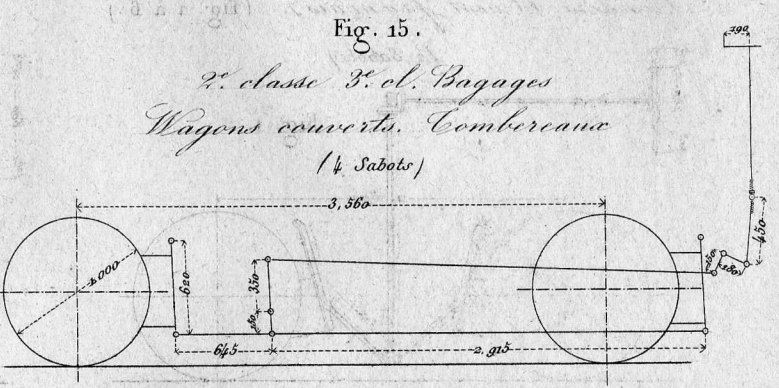
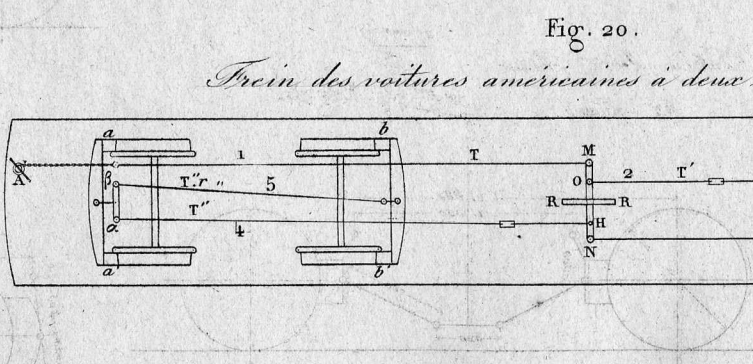
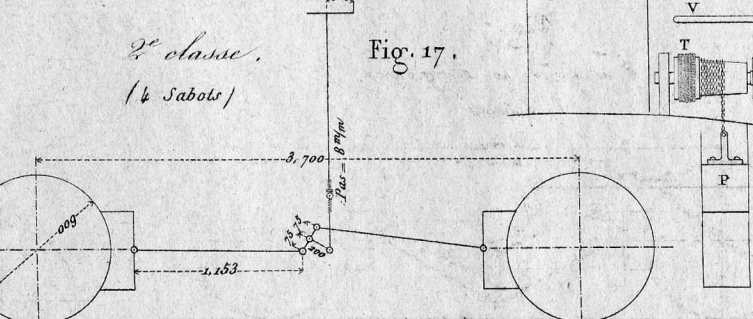
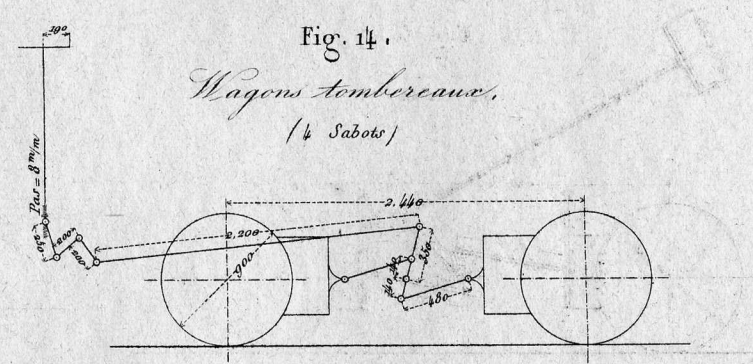
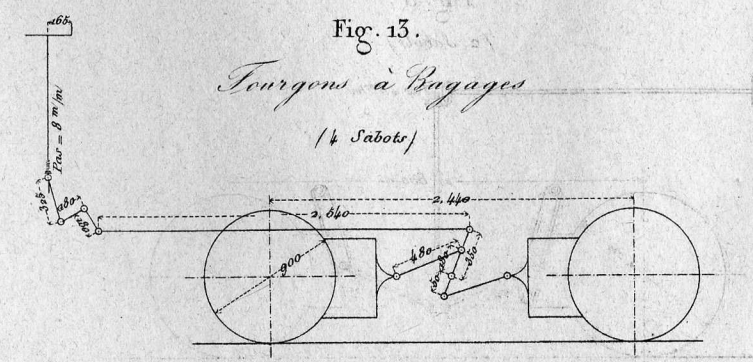
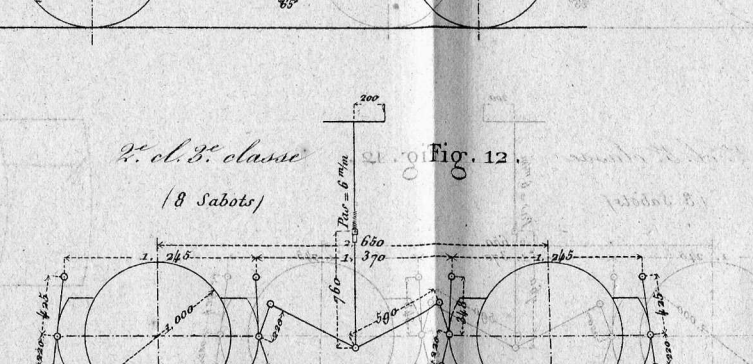
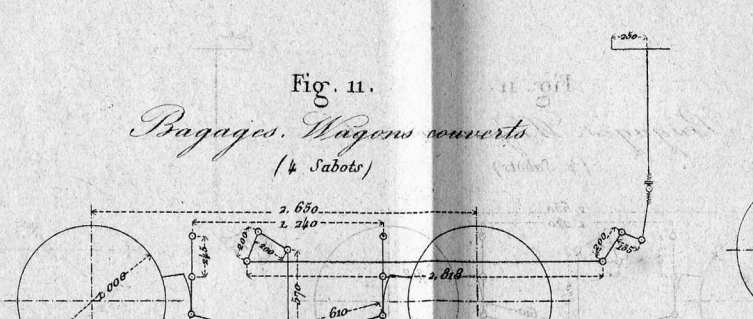
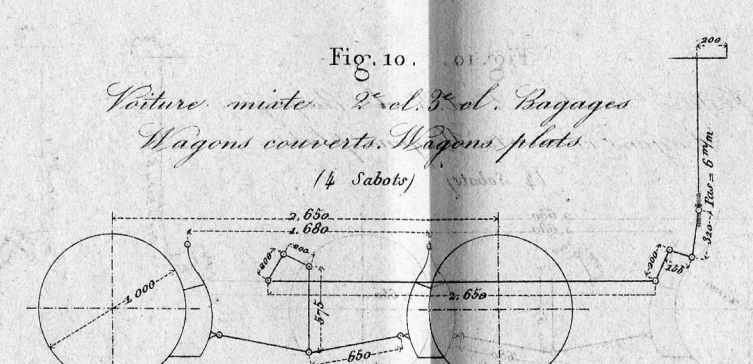
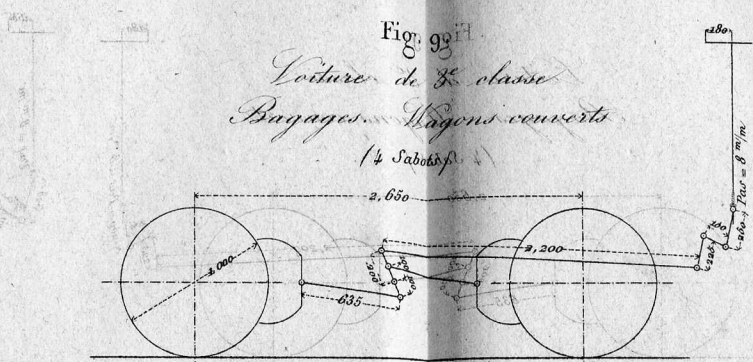
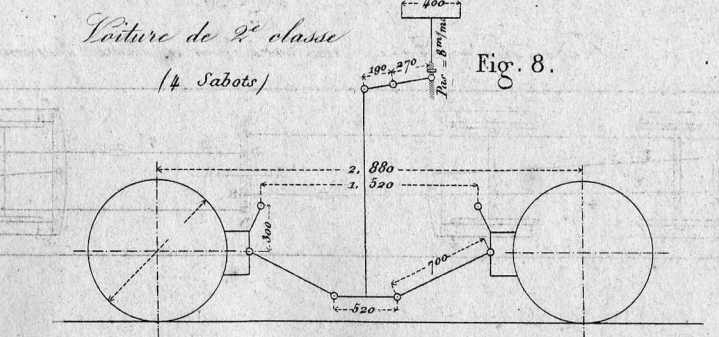
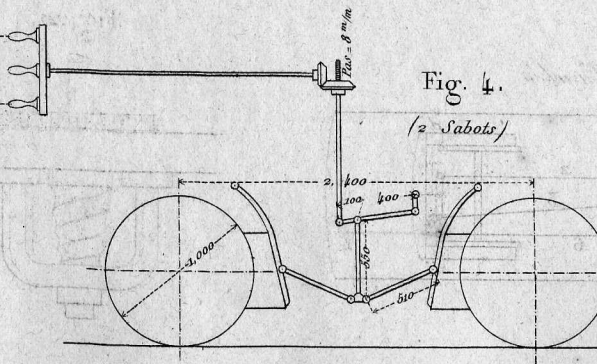
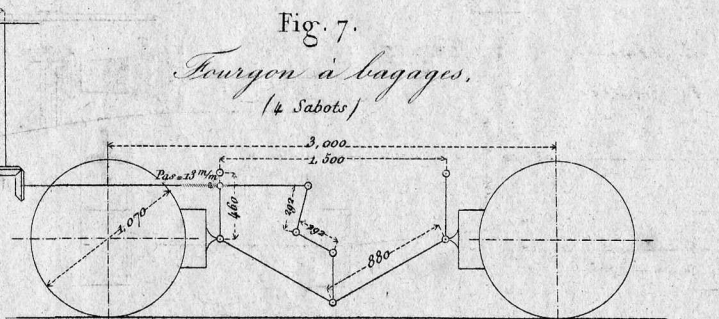
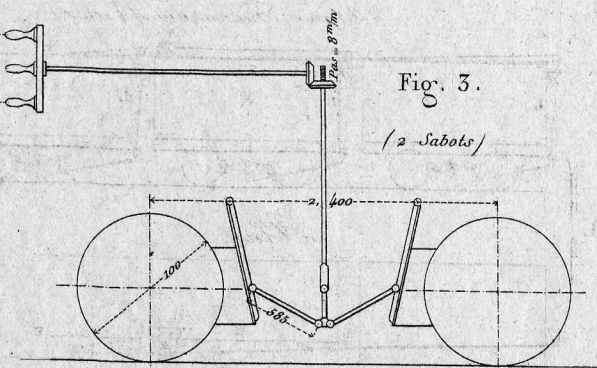
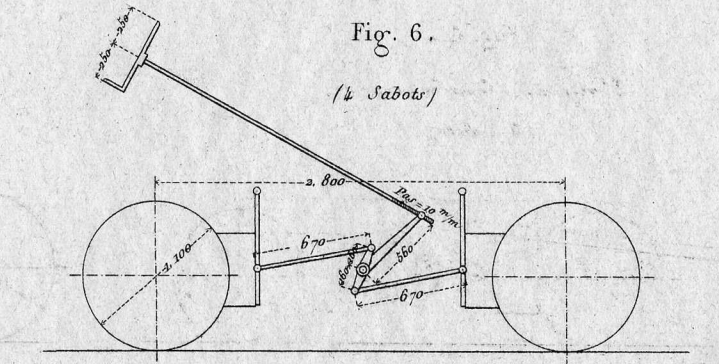
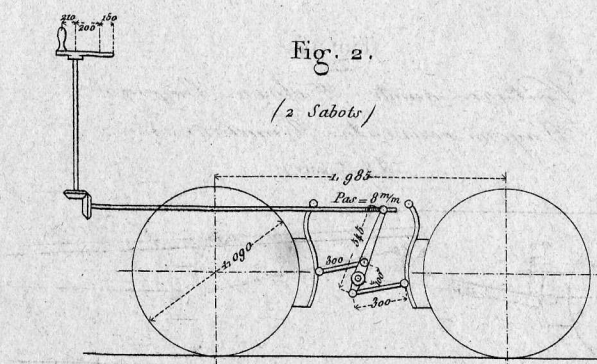
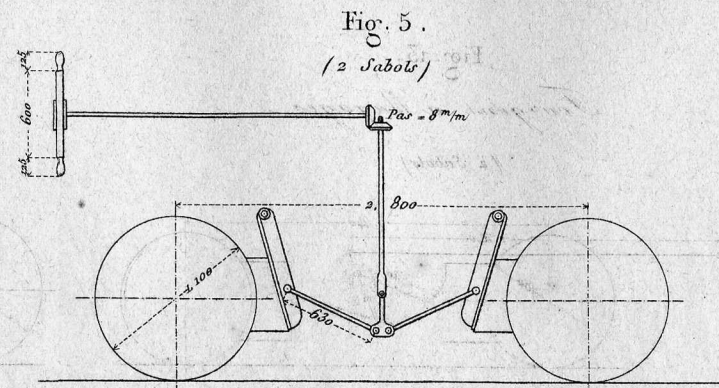
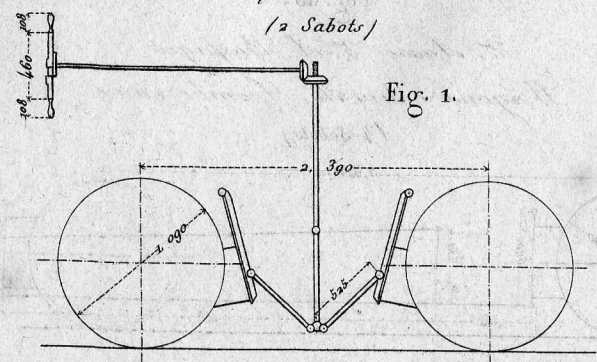


Echelle des Fig. 1 à 14 et 16 à 17 de 0<sup>m</sup>.02 pour 1 mètre

Echelle de la Fig 15 de 0<sup>m</sup>.1 pour 1 mètre

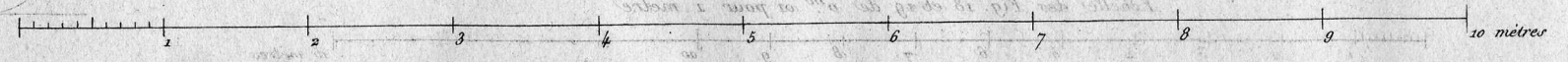
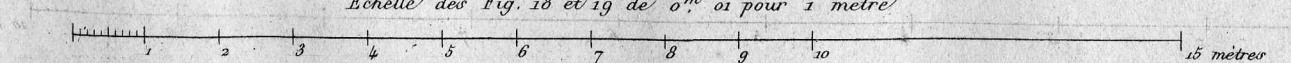
Echelle de la Fig 18 de 0<sup>m</sup>.04 pour 1 mètre

Tenders (Ouest français). (Fig. 1 à 6.)

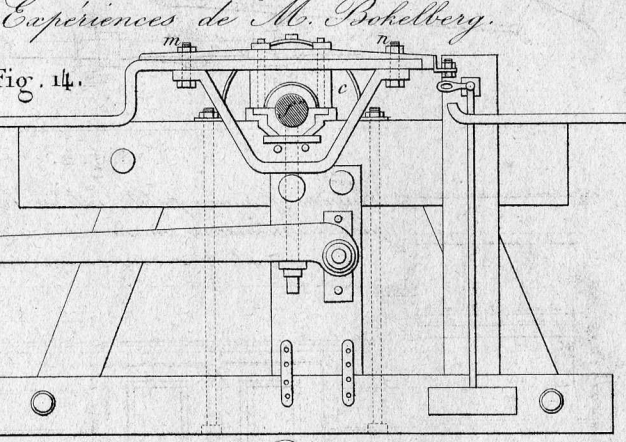
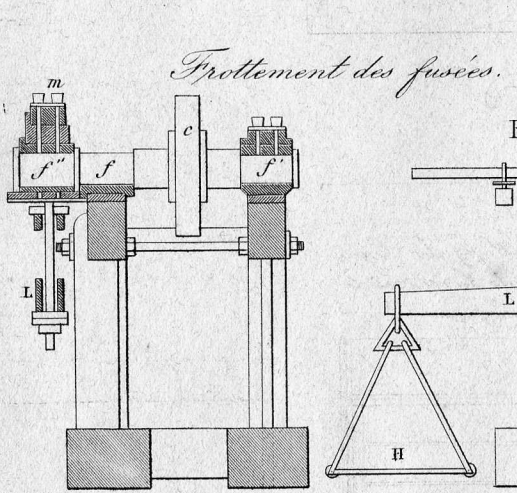
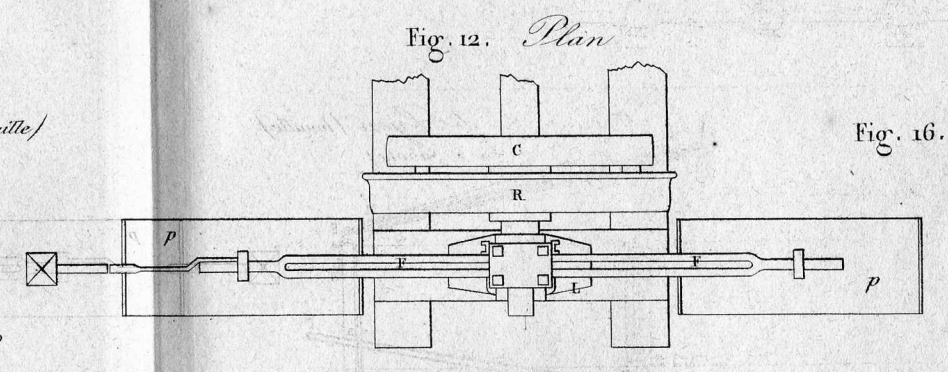
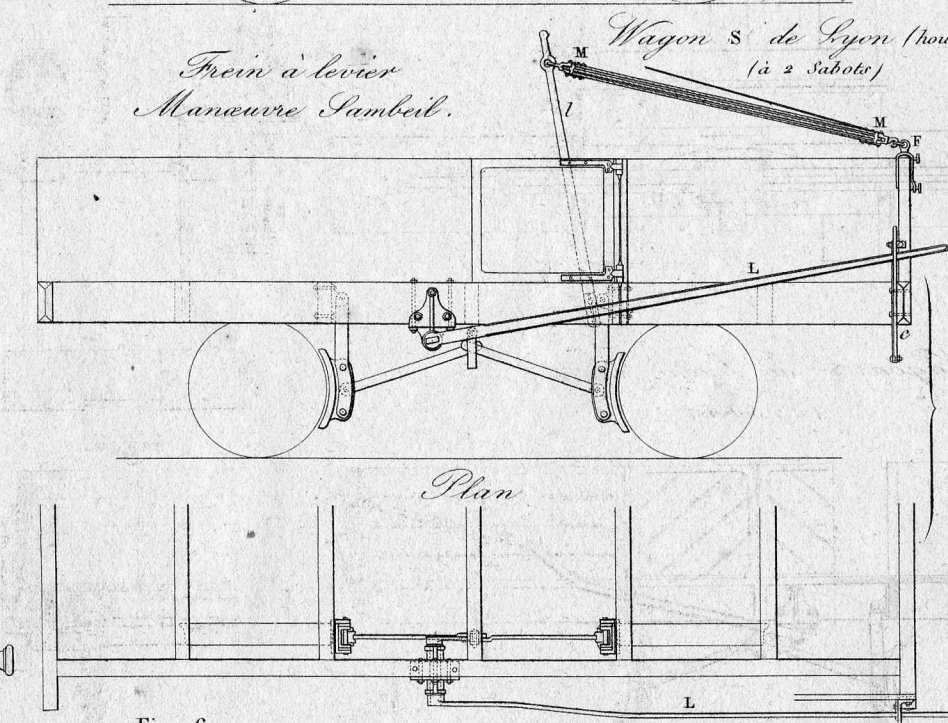
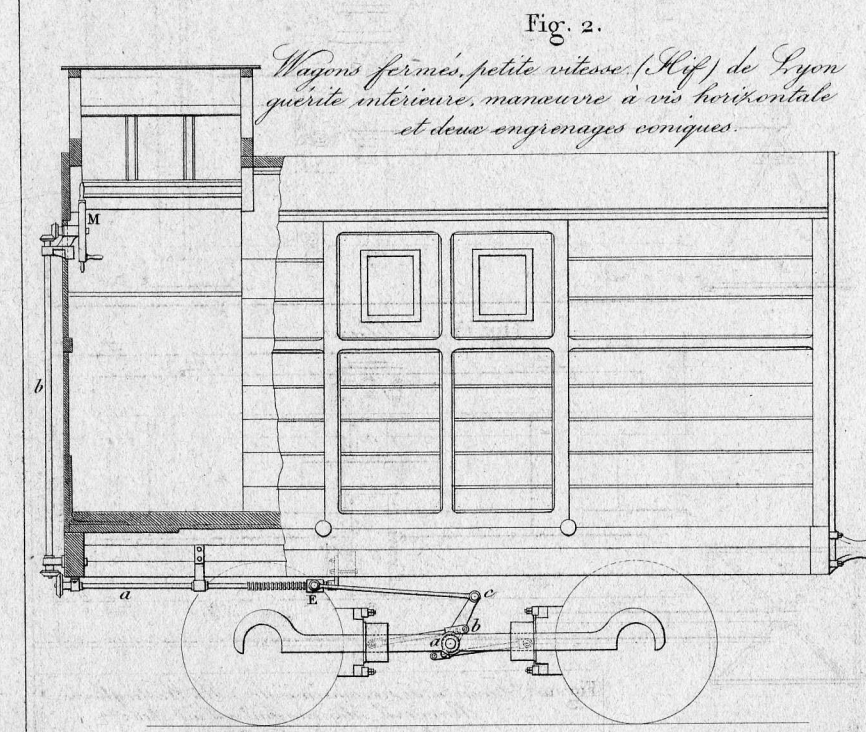
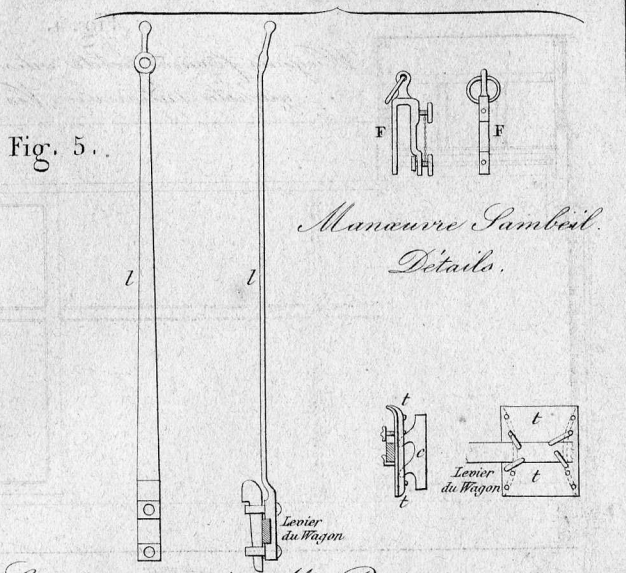
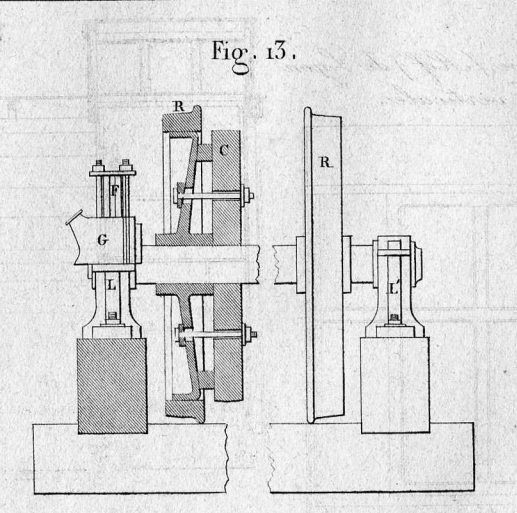
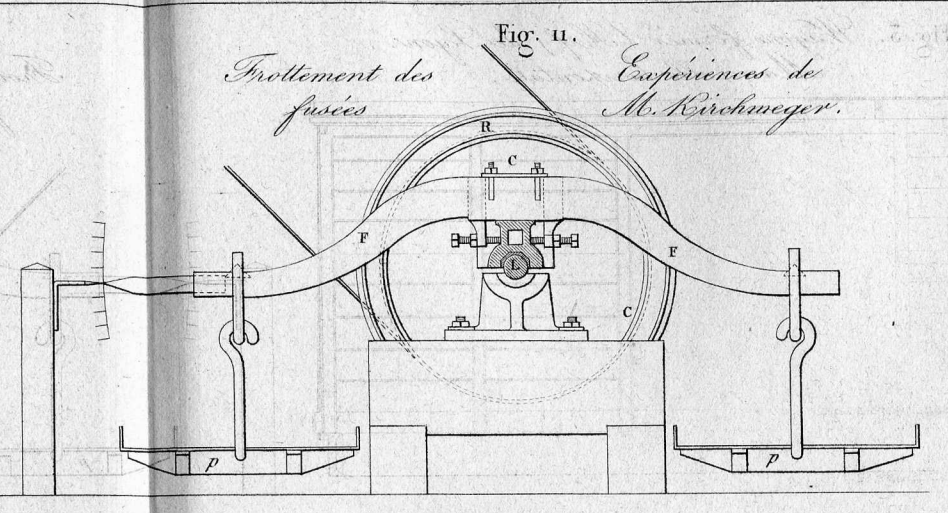
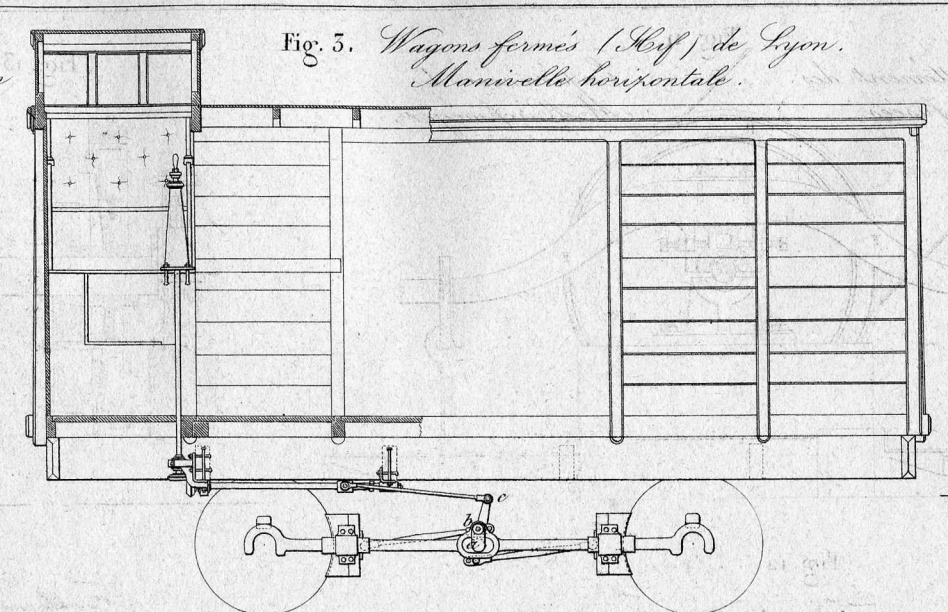
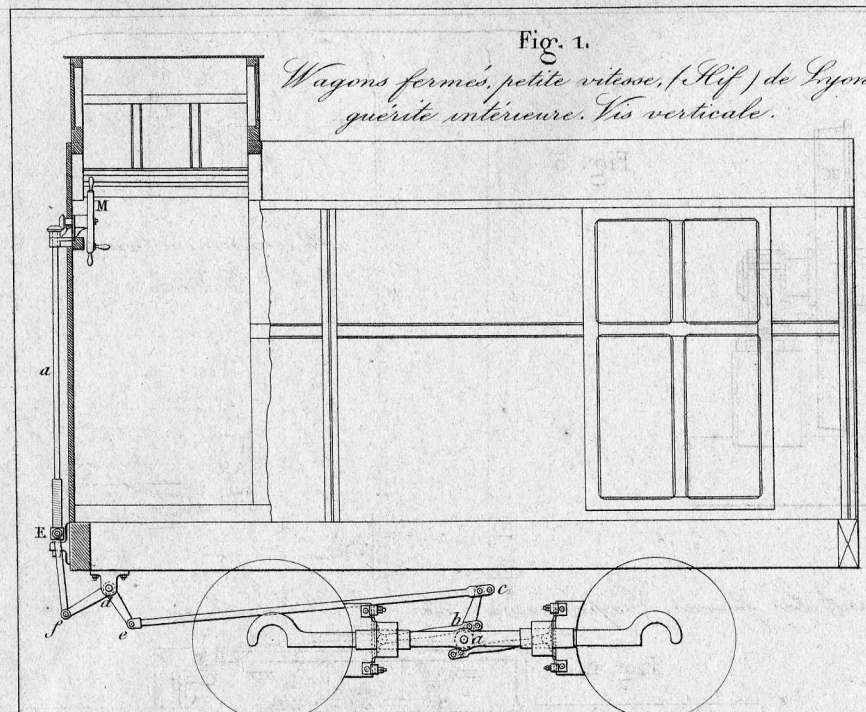


Echelle des Fig. 18 et 19 de 0<sup>m</sup> 01 pour 1 mètre

Echelle des Fig 1 à 17 de 0<sup>m</sup> 02 pour 1 mètre



C. COUCHE. Chemins de Fer.



Echelle des Fig. 1 à 4 et 7 et 8 de 0<sup>m</sup>.02 p<sup>r</sup>. 1 mètre  
 Echelle des Fig. 6 et 10 de 0<sup>m</sup>.1 pour 1 mètre  
 Echelle des Fig. 5 et 11 à 16 de 0<sup>m</sup>.04 pour 1 mètre  
 Echelle de la Fig. 10 de 0<sup>m</sup>.25 pour 1 mètre

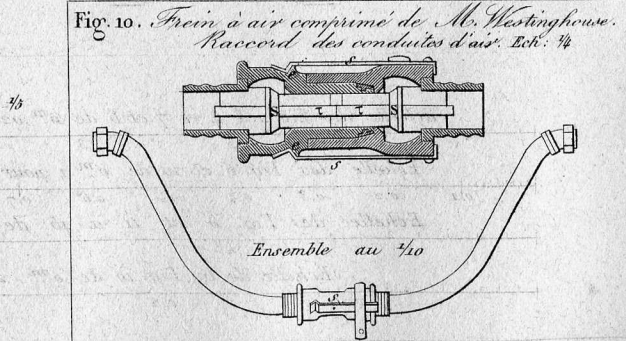
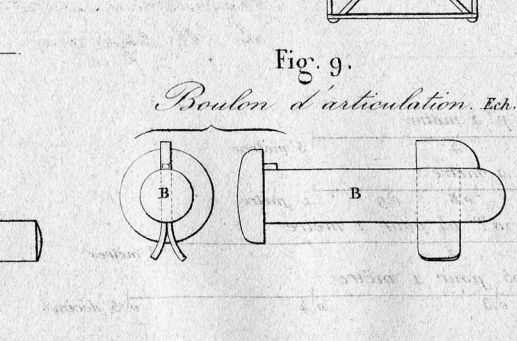
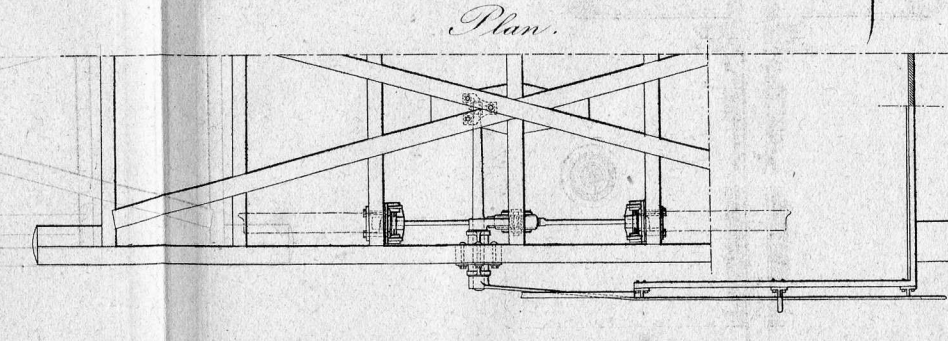
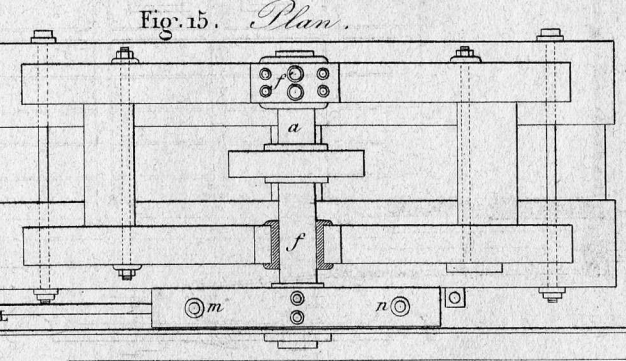
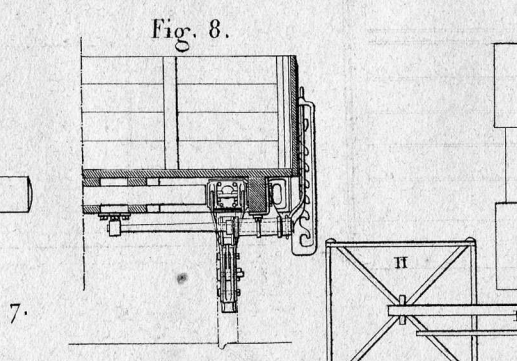
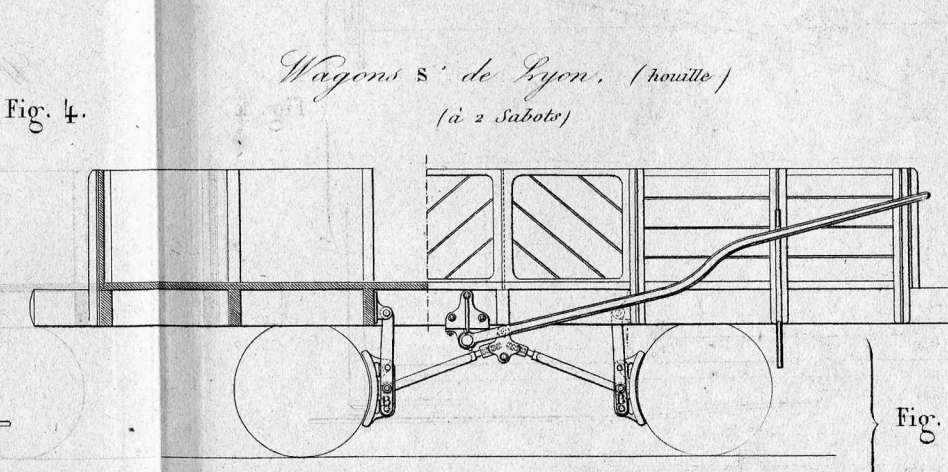
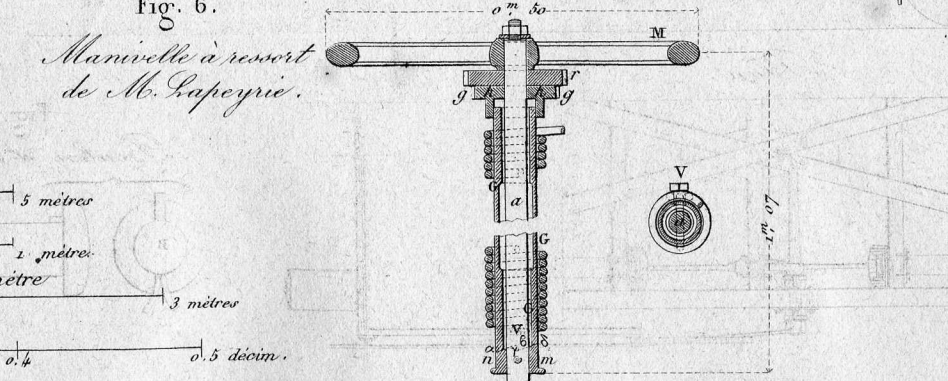




Fig. 1. Frein hydraulique des locomoteurs, Système Agulio, pour très fortes inclinaisons.

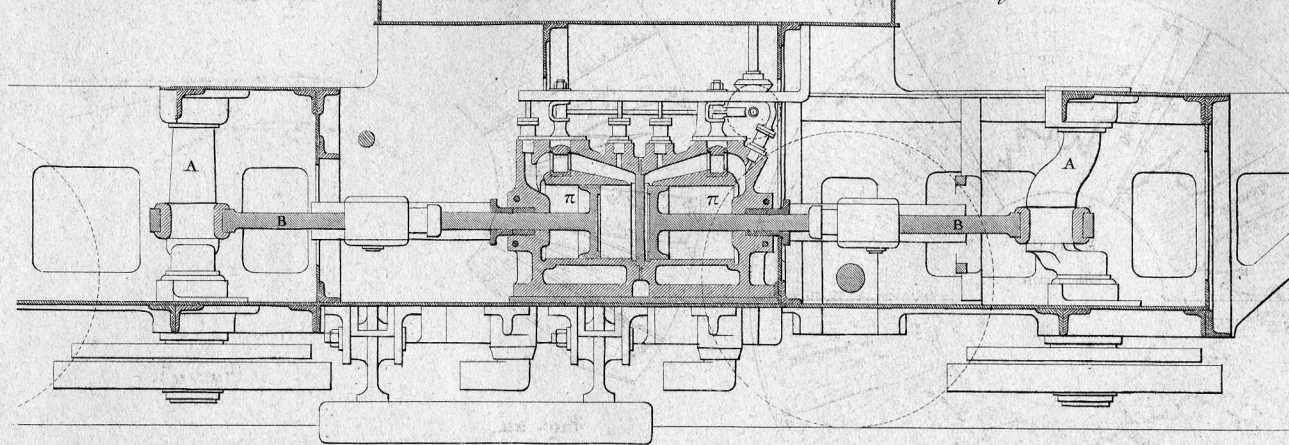


Fig. 2. Plan

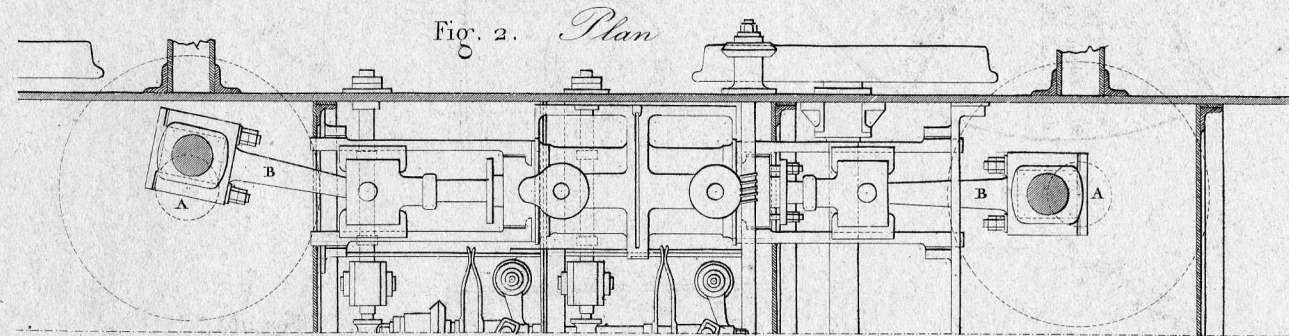


Fig. 3.

Fig. 3 à 8. Tachomètre de M. M. Deniel et Guillet.

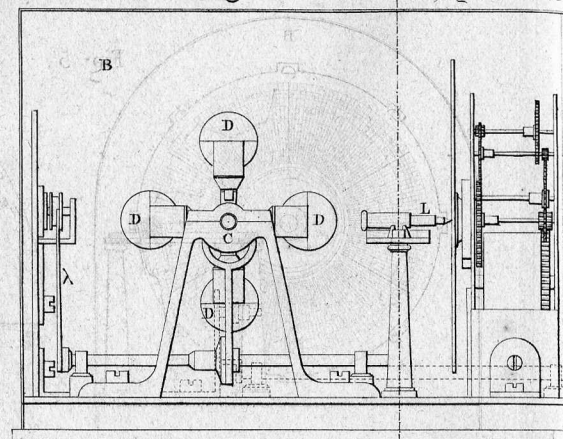


Fig. 4.

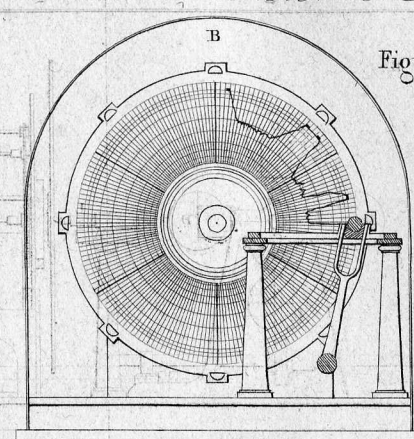
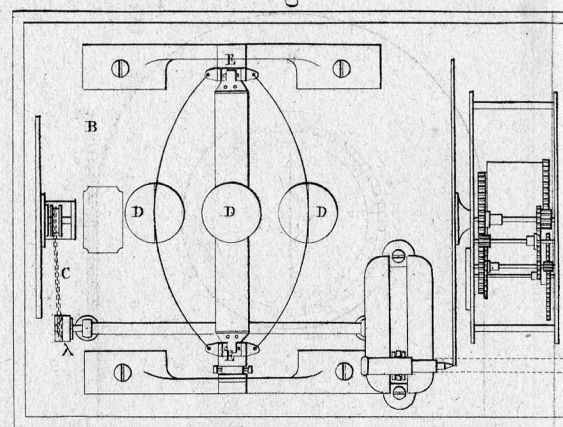


Fig. 5.

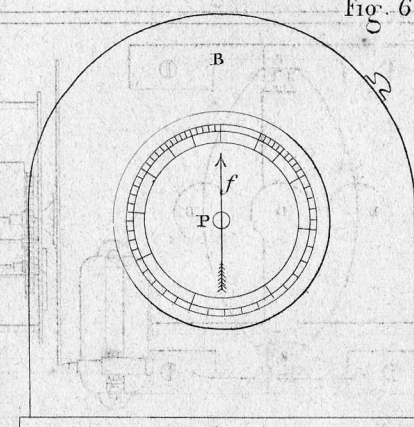


Fig. 6.

Fig. 7.

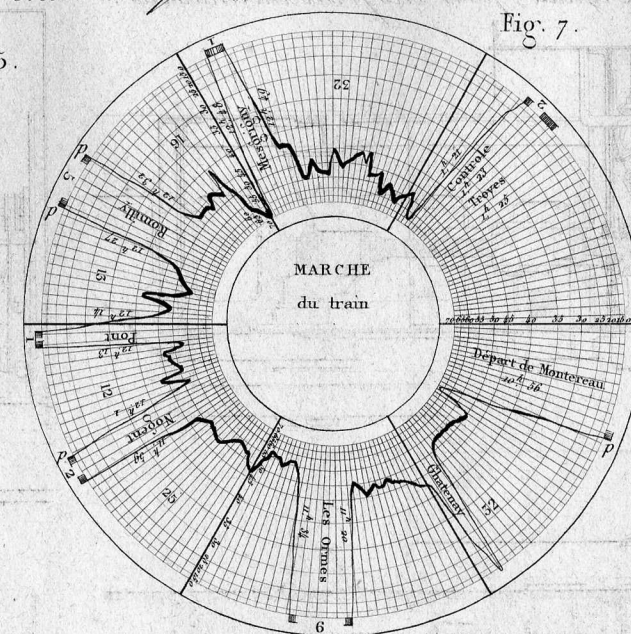


Fig. 20

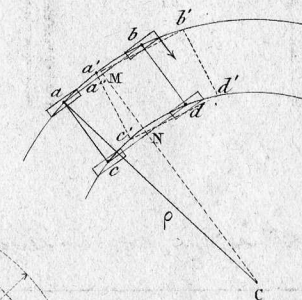


Fig. 8.

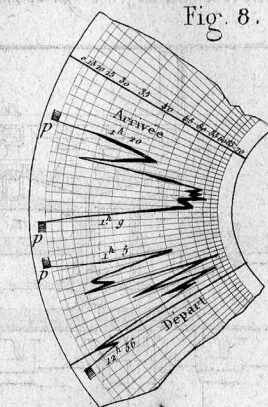


Fig. 22.

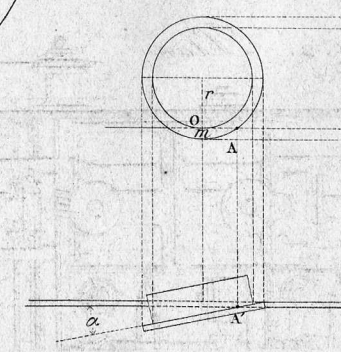


Fig. 24.

Fig. 21.

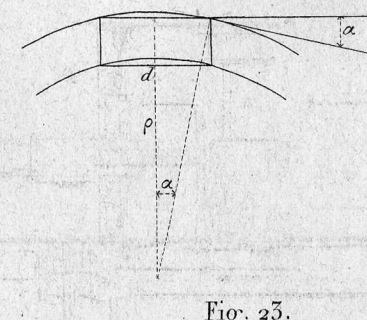


Fig. 23.

Fig. 25.

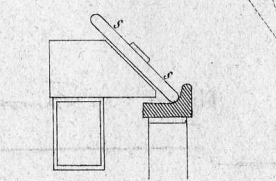


Fig. 7. Frein à air de M. Westinghouse. — Application aux véhicules à deux trains articulés.

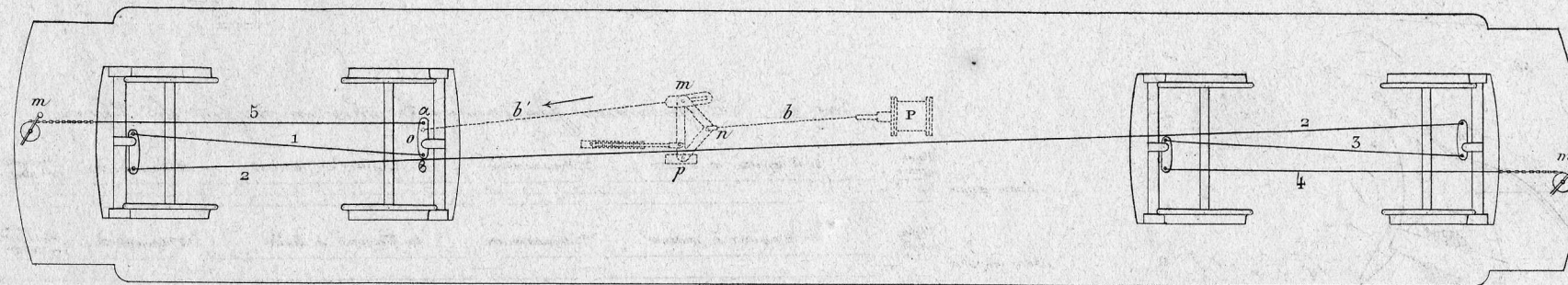


Fig. 9. Déclenchement des freins à contre-poids de M. Bricogne.

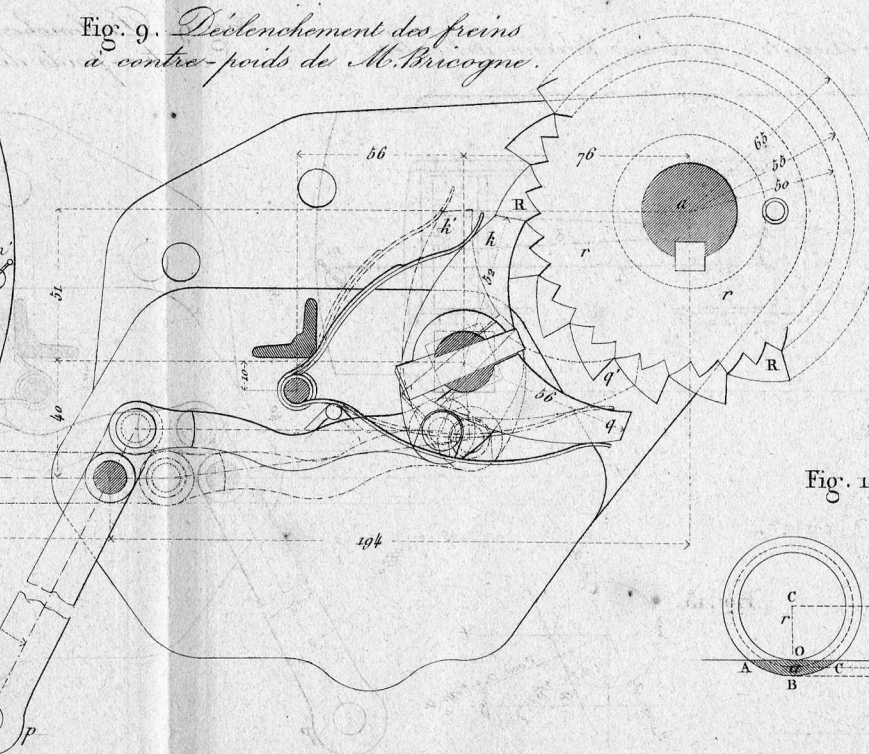


Fig. 19. Expériences faites sur le chemin de fer de Lyon.

Wagon à frein	10 Wagons à huile	2 <sup>e</sup> Dynamomètre	10 Wagons à graisse	1 <sup>er</sup> Dynamomètre	Machine et tender
Jours pairs	→				
Wagon à frein	10 Wagons à graisse	2 <sup>e</sup> Dynamomètre	10 Wagons à huile	1 <sup>er</sup> Dynamomètre	Machine et tender
Jours impairs	←				

Fig. 10.

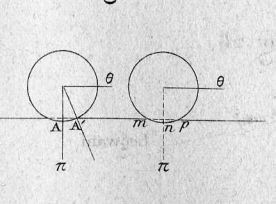


Fig. 11.

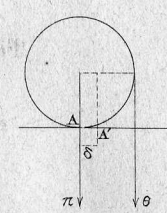


Fig. 12.

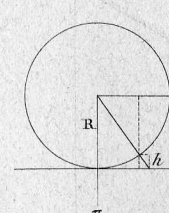


Fig. 16.

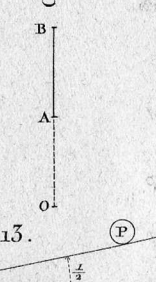


Fig. 13.

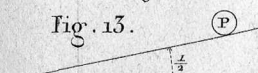


Fig. 14.

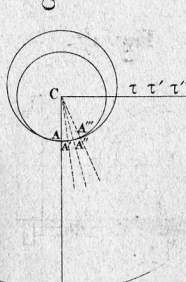


Fig. 15.

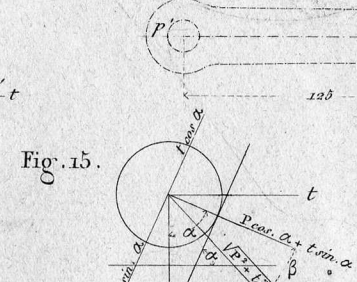


Fig. 17.

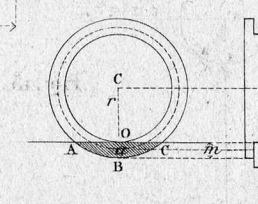
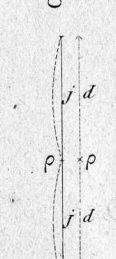


Fig. 18.



Poni (976<sup>m</sup> au-dessus du niveau de la mer)

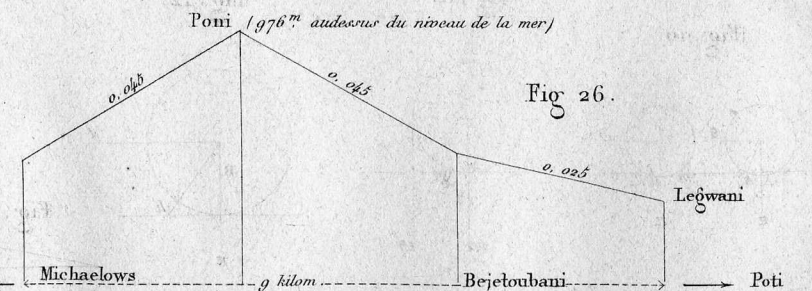
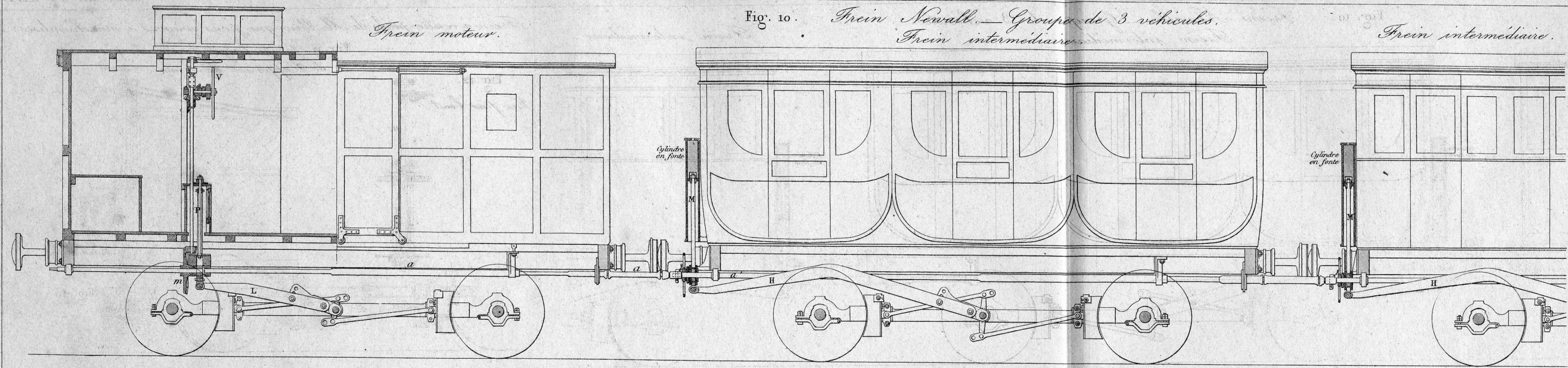
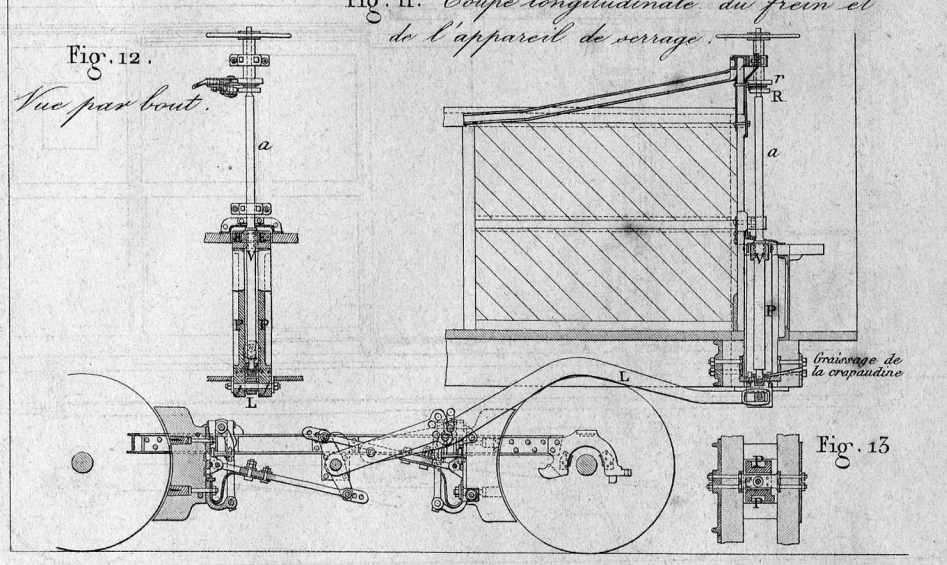


Fig. 26.



Frein à contre-poids de M. Briogne pour wagons à marchandises.



Fourgon moteur (Fig. 1 à 3.)

Fig. 1. Coupe longitudinale suivant AB.

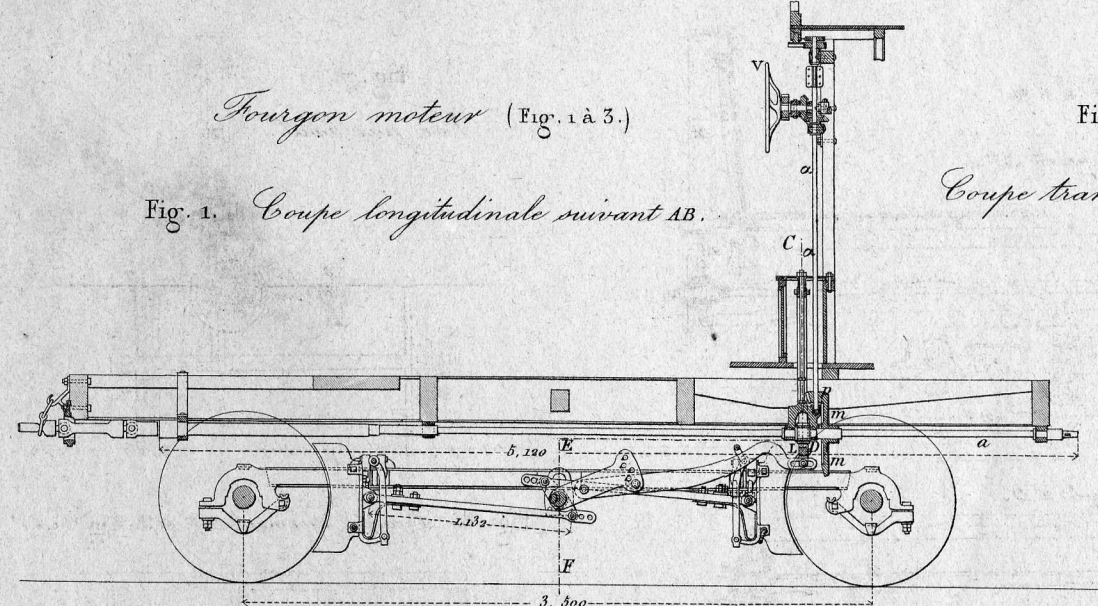
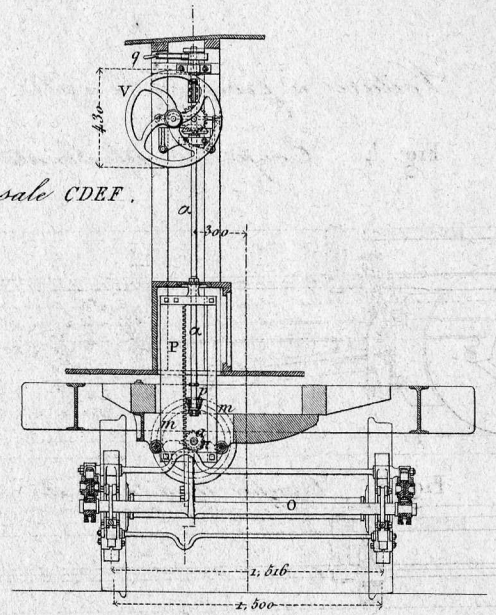


Fig. 3.

Coupe transversale CDEF.



Voiture à frein Newall. (Fig. 4 à 9.)

Fig. 4. Coupe longitudinale suivant AB.

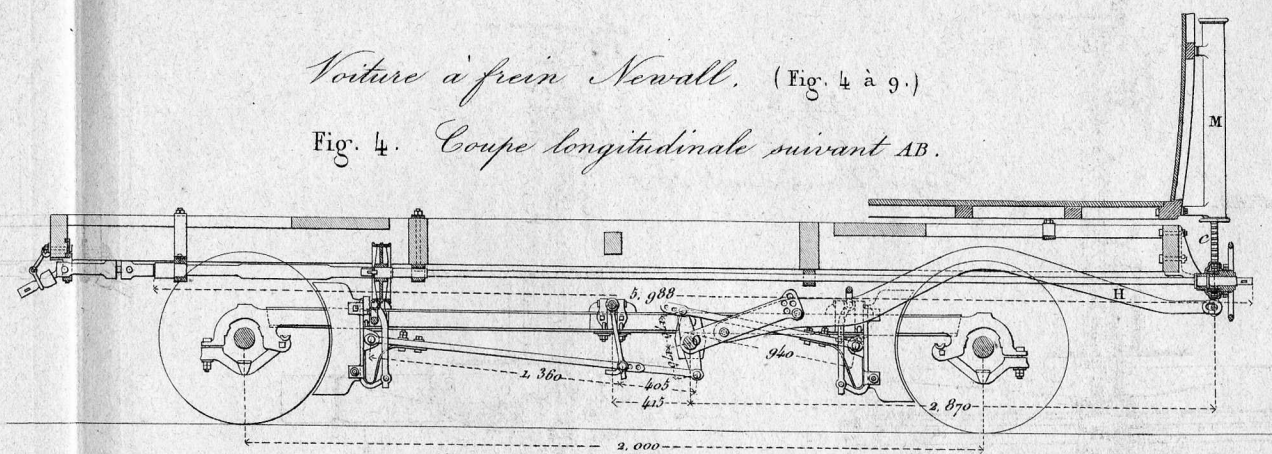


Fig. 6. Coupe longitudinale suivant C.D.

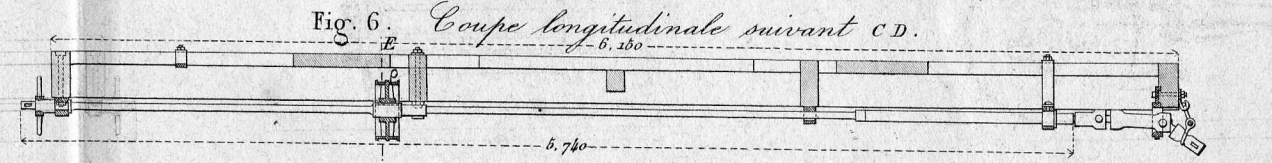


Fig. 5. Plan.

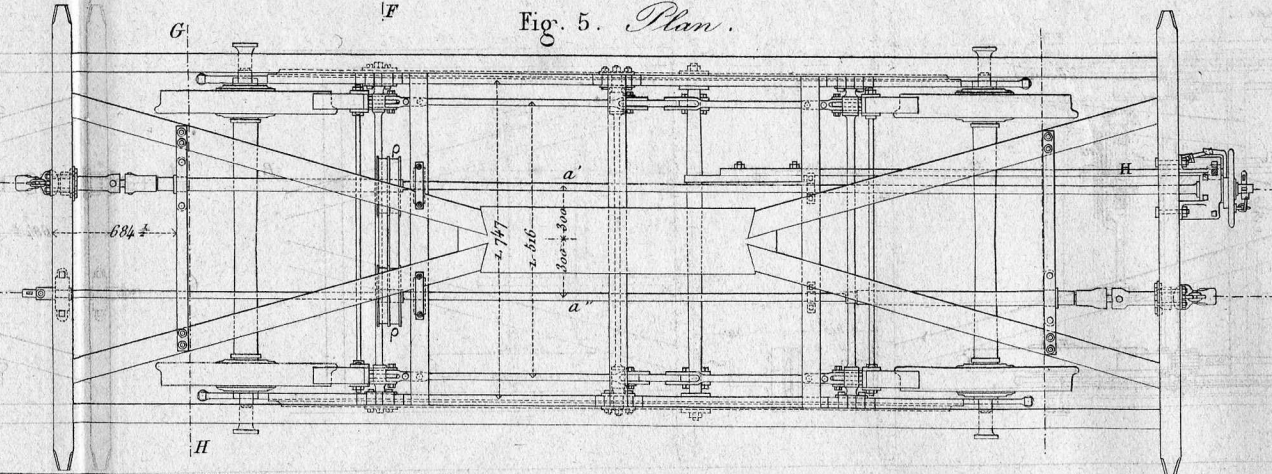


Fig. 7.

Vue par bout.

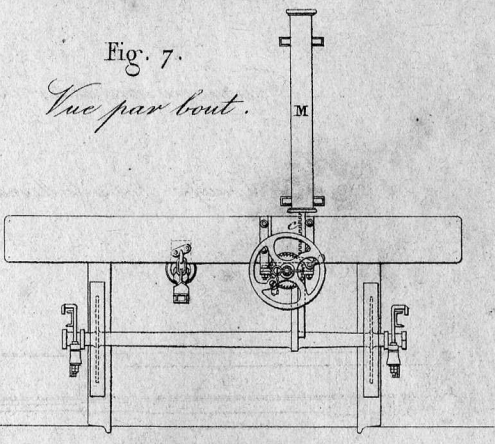


Fig. 8. Coupe suivant EF de la Fig. 6.

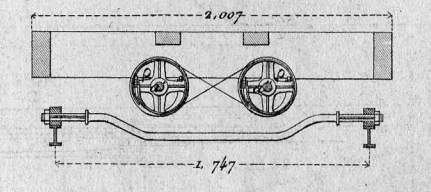
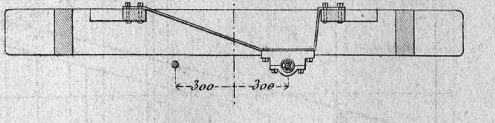


Fig. 9. Coupe suivant GH du plan.



Echelle de 0<sup>m</sup> 025 pour 1 metre

# VOIE MATÉRIEL ROULANT

ET  
EXPLOITATION TECHNIQUE

DES  
CHEMINS DE FER

OUVRAGE SUIVI D'UN APPENDICE SUR LES TRAVAUX D'ART

PAR  
M. CH. COUCHE,

Inspecteur général des mines, Professeur du cours de construction et de chemins de fer à l'École des mines.

TOME TROISIÈME.

PRODUCTION ET DISTRIBUTION DE LA VAPEUR.  
MOYENS DE DÉTRUIRE ET DE MODÉRER LA VITESSE. — RÉSISTANCE DES TRAINS.  
PUISSANCE ET EFFET UTILE DE LA LOCOMOTIVE.  
SUPPLÉMENT: RÉVISION, ADDITIONS.

ATLAS

(21 PLANCHES)

PARIS  
DUNOD, ÉDITEUR,

Précédemment Carilian-Gœury et V<sup>o</sup> Dalmont,  
LIBRAIRE DES CORPS DES PONTS ET CHAUSSÉES, DES MINES ET DES TÉLÉGRAPHES,

QUAI DES AUGUSTINS, N° 49.

1876

(Tous droits de traduction et de reproduction réservés.)

# PLANCHES

DU

TOME TROISIÈME.

- Pl. I. — Locomotives. — Chaudières. — Vaporisation. — Détails divers.  
Pl. II. — Locomotives. — Chaudières. — Armatures. — Appareils fumivores. — Condensation.  
Pl. III. — Locomotives. — Chaudières. — Armatures. — Appareils fumivores. — Érosions.  
Pl. IV. — Locomotives. — Chaudières. — Régulateurs. — Soupapes. — Souffleurs.  
Pl. V. — Locomotives. — Échappement. — Cheminées. — Distribution.  
Pl. VI. — Locomotives. — Distributions diverses.  
Pl. VII. — Locomotives. — Distributions diverses.  
Pl. VIII. — Locomotives. — Quelques détails du mécanisme.  
Pl. IX. — Locomotives. — Effort de traction au point mort et jusqu'à une certaine limite d'admission inverse. — Contre-vapeur. — Diagrammes.  
Pl. X. — Moyens d'arrêt. — Emploi de la vapeur. — Renversement de la distribution. — Injection. — Fermeture de l'échappement. — Ligne des Dombes. — Systèmes Landsée, Krauss, etc., etc.  
Pl. XI. — Freins divers.  
Pl. XII. — Freins divers.  
Pl. XIII. — Freins de tenders et de wagons.  
Pl. XIV. — Freins divers. — Résistance des trains.  
Pl. XV. — Frein hydraulique pour très-fortes rampes à machines fixes. — Tachomètre. — Résistance. — Influence des courbes.  
Pl. XVI. — Frein à contre-poids et à transmission du Nord français. — Frein Newall.  
Pl. XVII. — Effet utile des locomotives. — Supplément.  
Pl. XVIII. — Travaux de la détente et de la compression. — Vapeur et eau. — Supplément.  
Pl. XIX. — Supplément.  
Pl. XX. — Supplément.  
Pl. XXI. — Supplément.

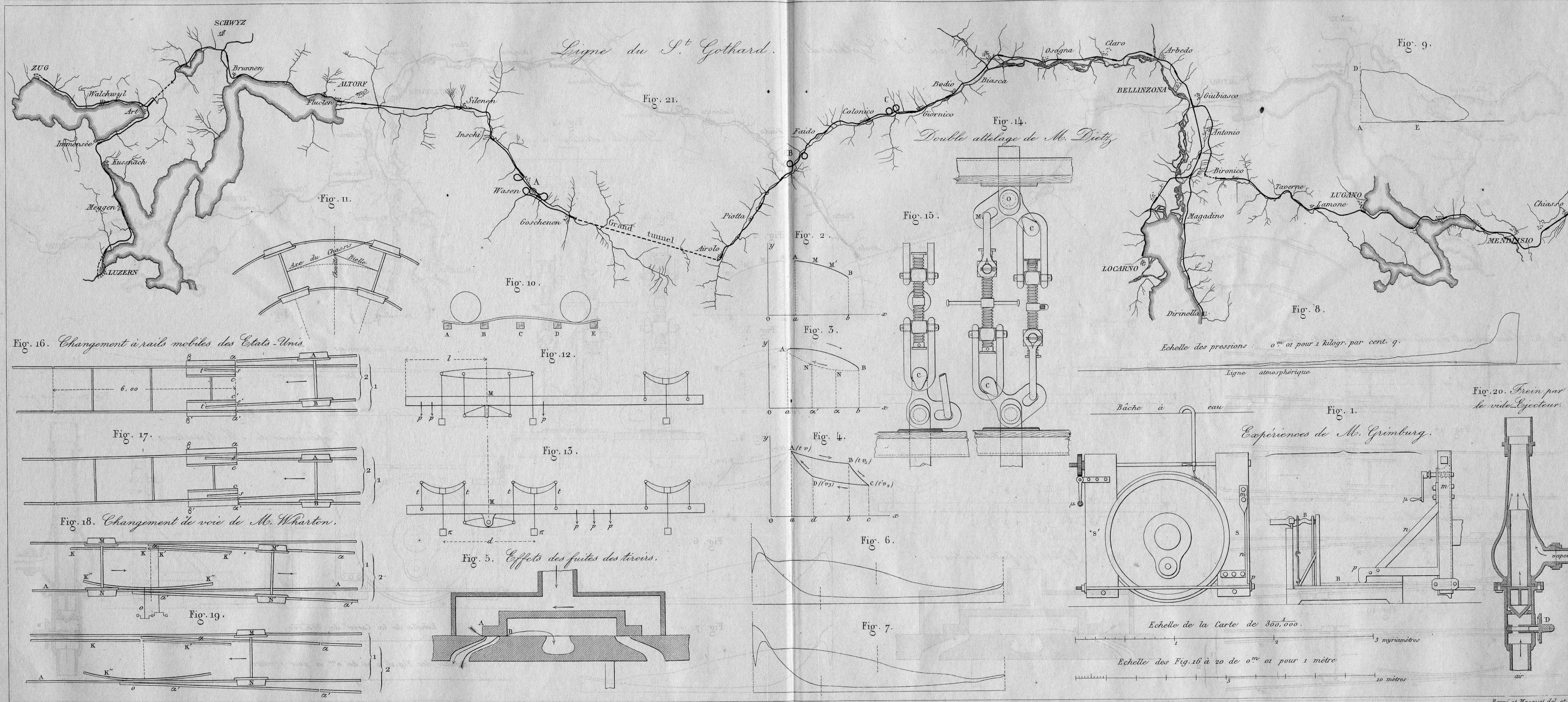


Fig. 4. Plan

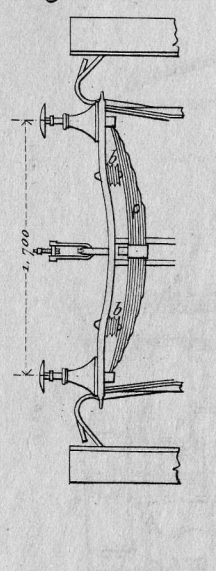
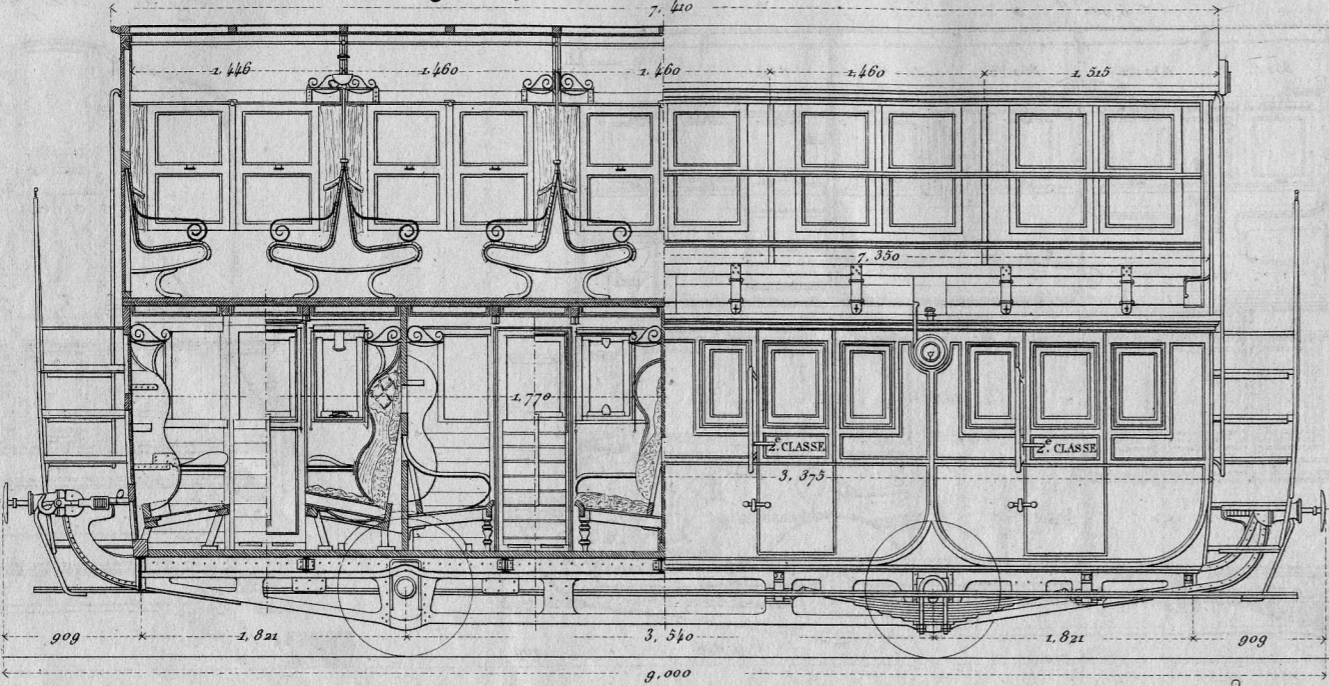


Fig. 1. Lignes de banlieue.



Nouvelles voitures de M. Vidard. (fig. 1 à 4.)

Fig. 2. Grandes lignes.

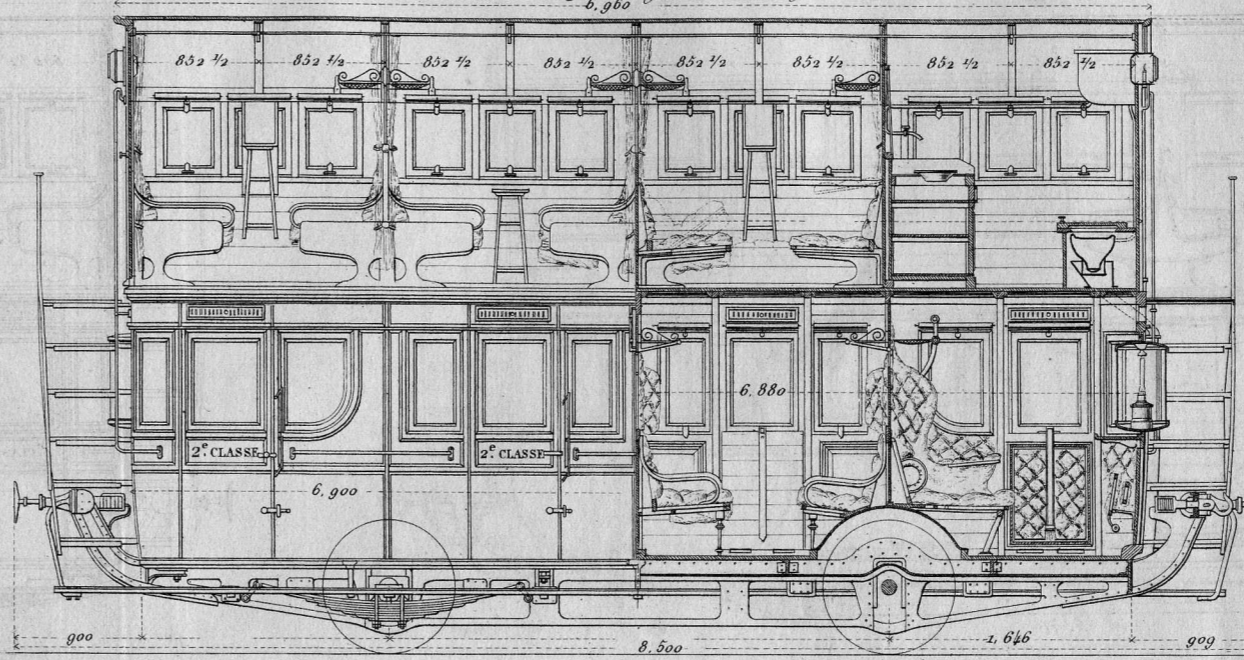


Fig. 3. Vue par bout.

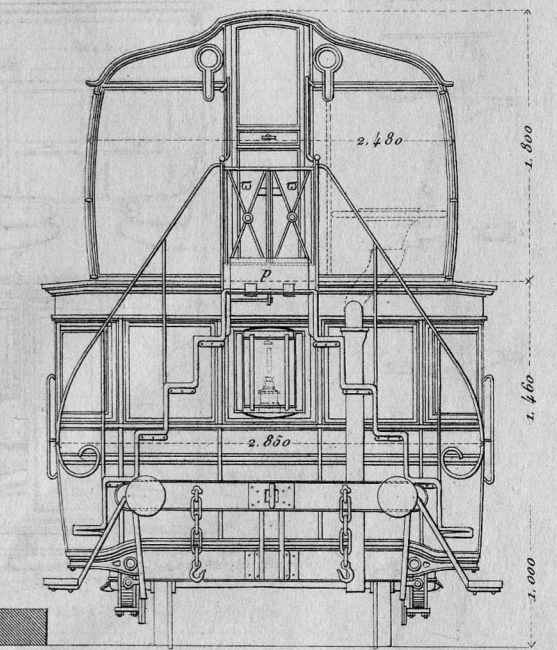
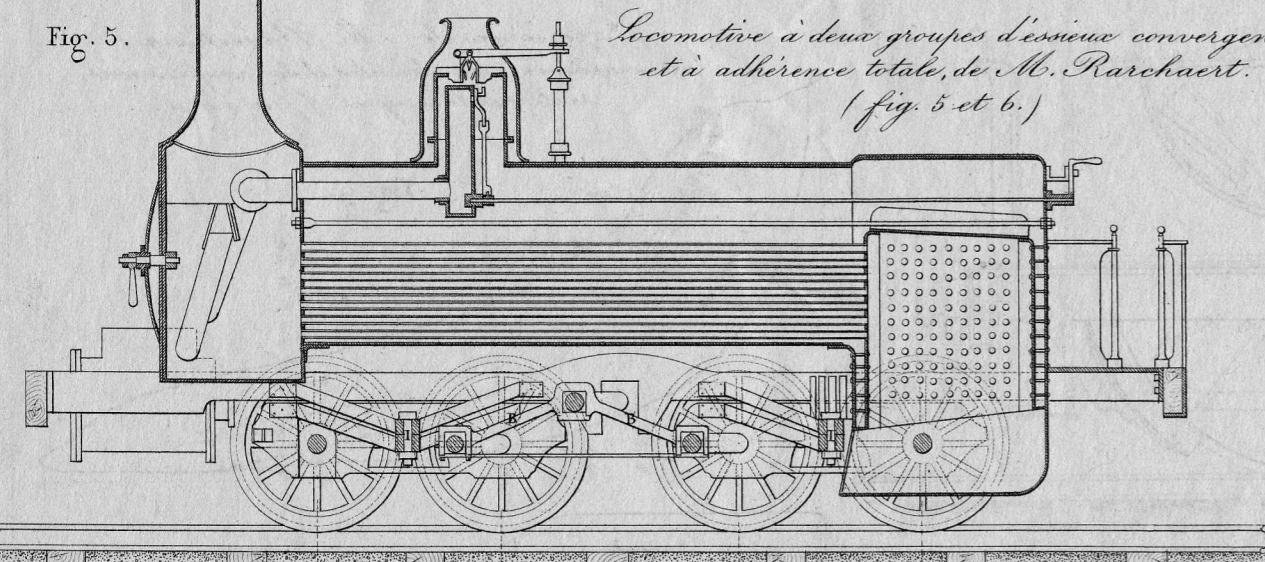
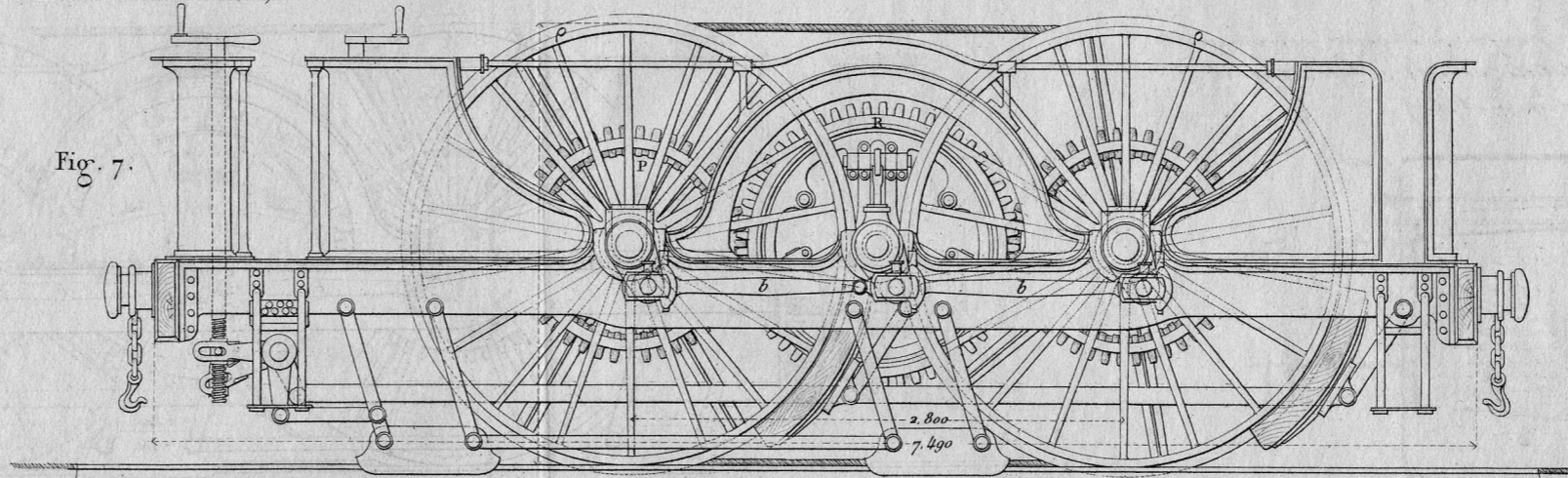


Fig. 5.



Locomotive à deux groupes d'essieux convergents et à adhérence totale, de M. Rarchaert. (fig. 5 et 6.)

Fig. 7.



Locomoteur pour faibles inclinaisons, agissant par l'adhérence. (Système Ayudis.) (fig. 7 et 8.)

Fig. 6. Plan

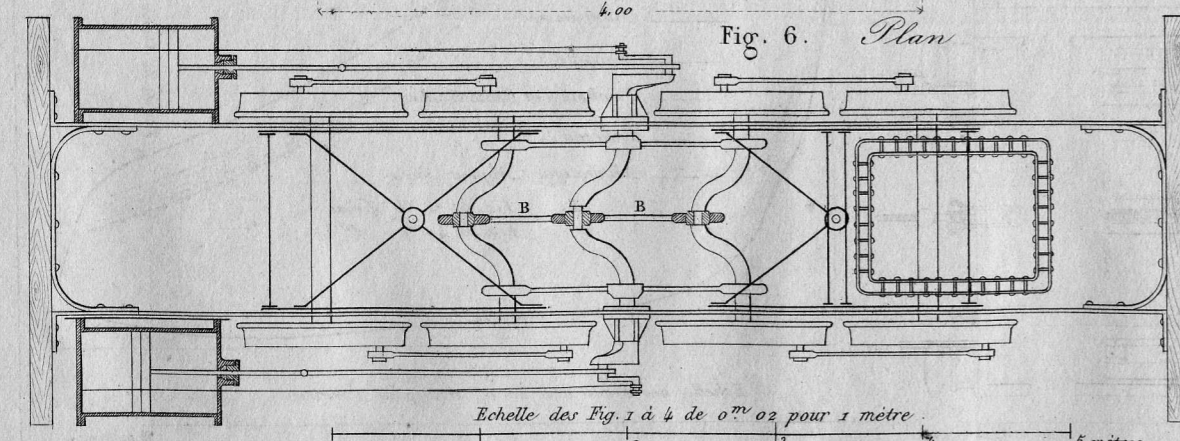
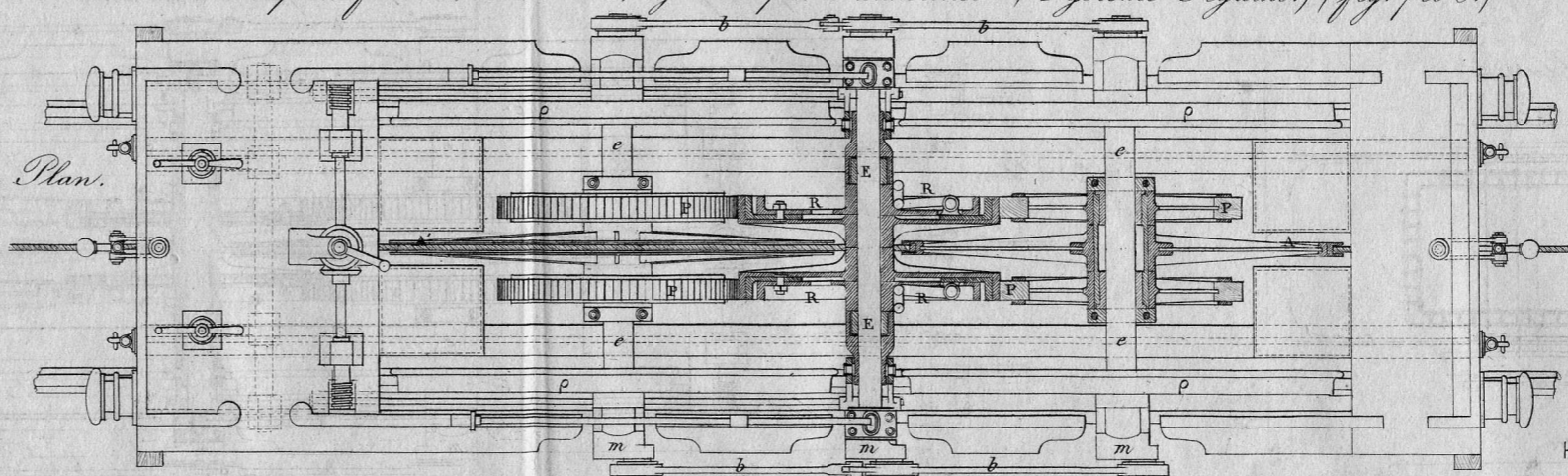


Fig. 8. Plan.



Expériences de M. Pauschinger comparaison des détente et des compressions, réelles et théoriques. (fig. 9 et 10.)

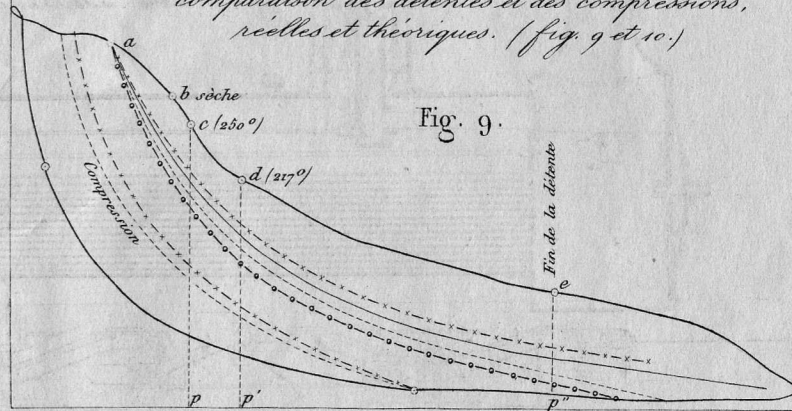


Fig. 9.

Légende des Fig. 9 et 10.

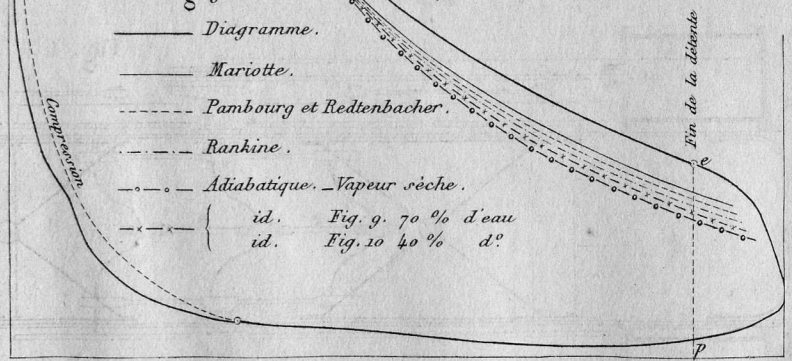


Fig. 10.

Echelle des Fig. 1 à 4 de 0<sup>m</sup> 025 pour 1 mètre

Echelle des Fig. 5 à 8 de 0<sup>m</sup> 025 pour 1 mètre

Fig. 1. Locomoteur à 6 pignons et à changement de marche. (figs à 4.)

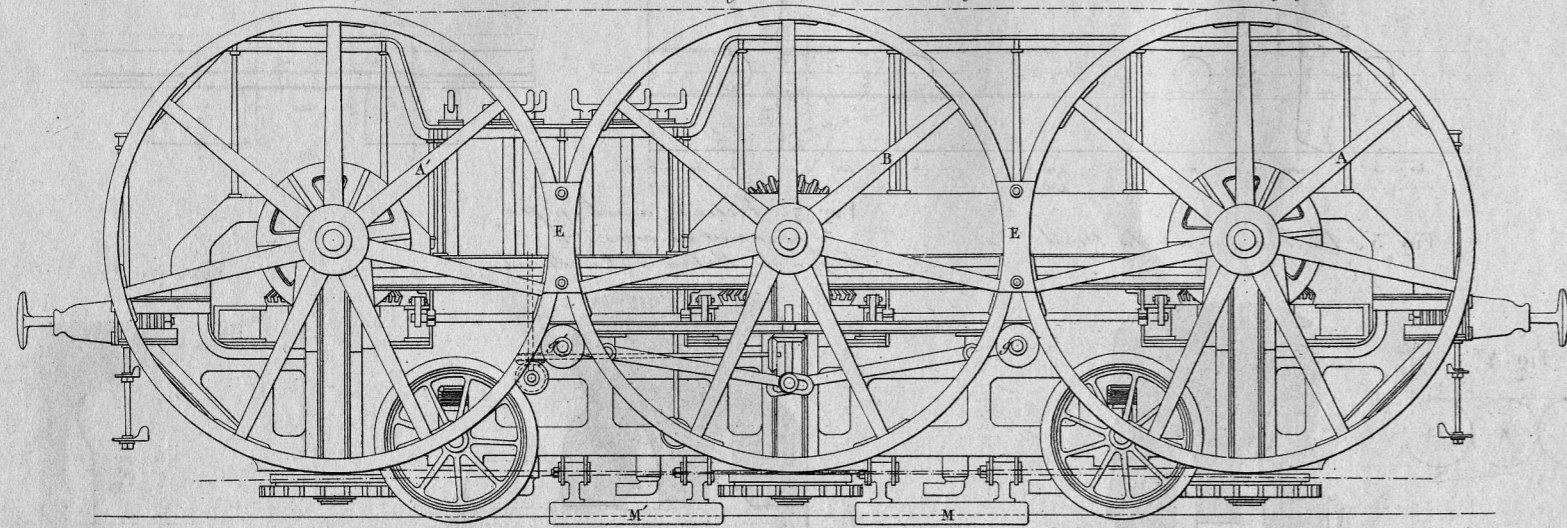


Fig. 2. Coupe transversale.

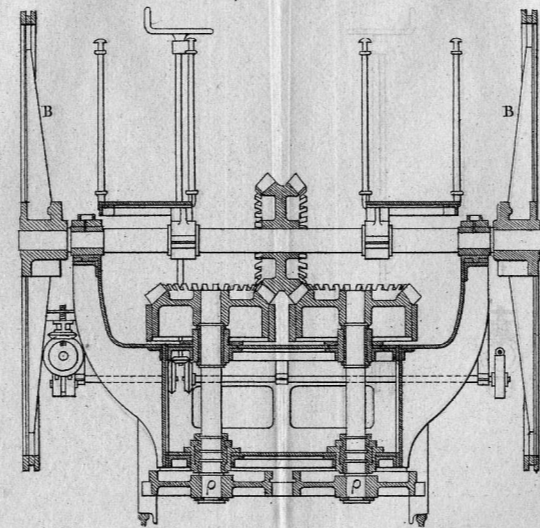


Fig. 6. Colisse sans rainure. Colisse avec rainure.

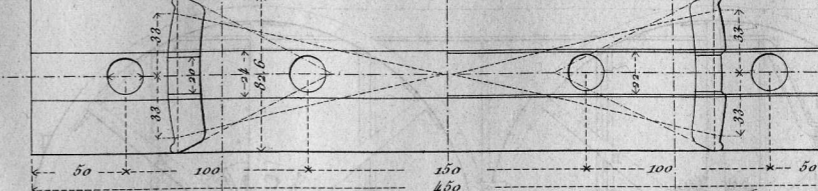


Fig. 8.

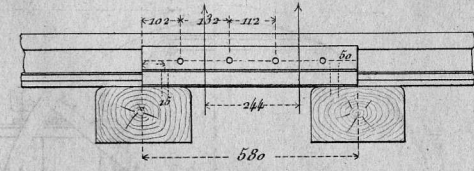


Fig. 3. Plan.

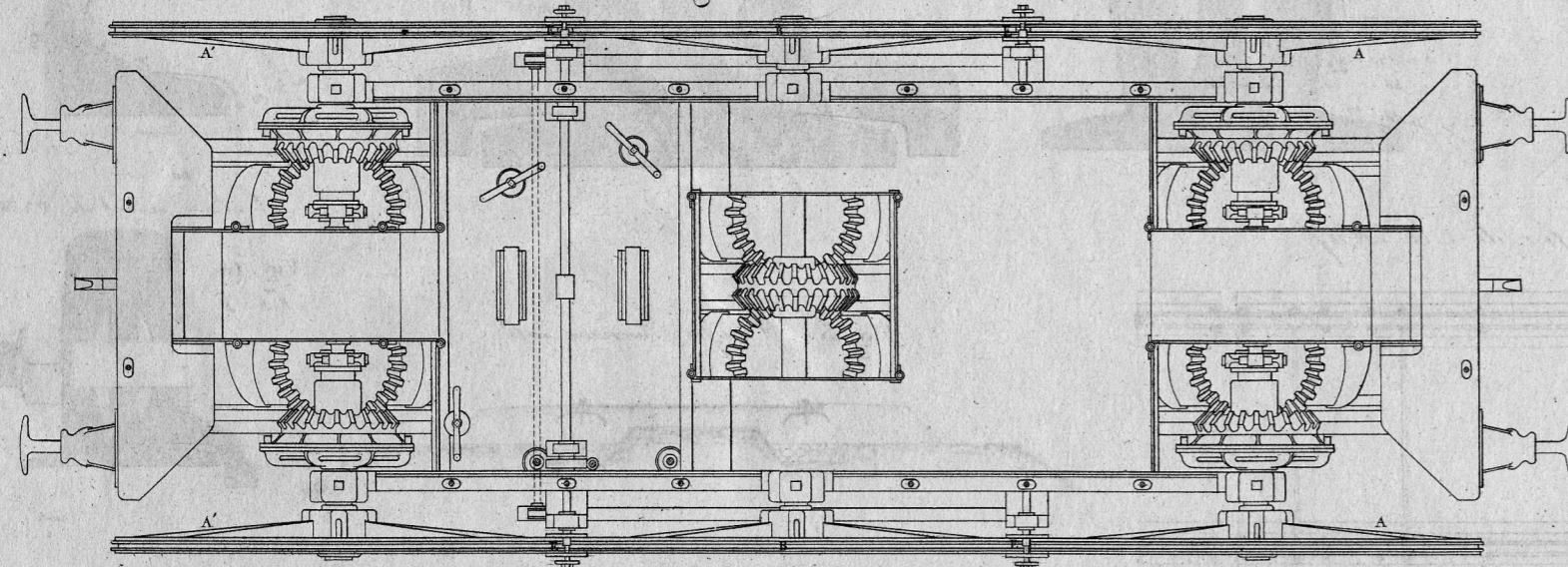


Fig. 4. Commande du changement de marche.

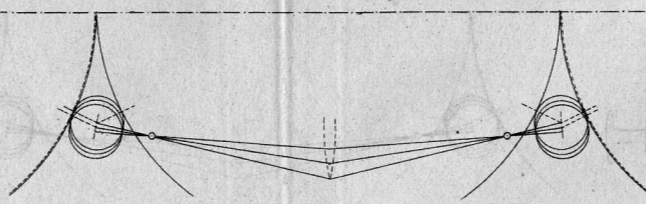


Fig. 5. Rail en acier du Nord (1/2)

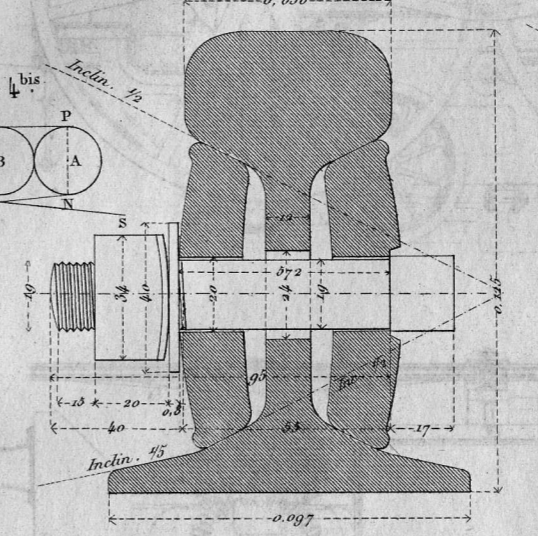


Fig. 7. Colisse arrêt en fer pour rail en acier (1/2) Ligne de Sébra à Friedland.

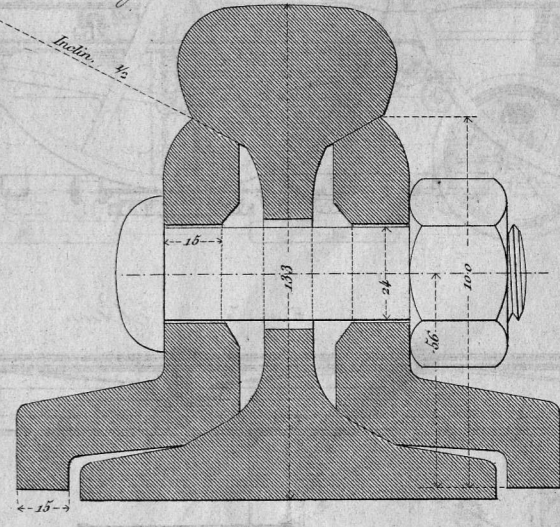


Fig. 9. (1/2)

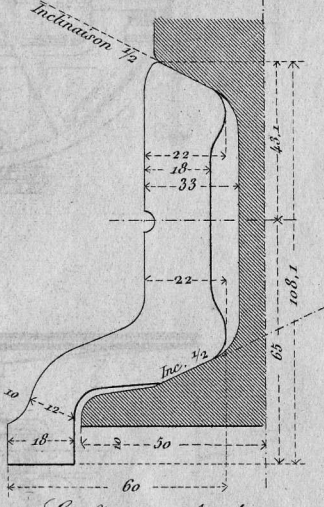


Fig. 12. Nouvelle voie en fer de M. Kilg.

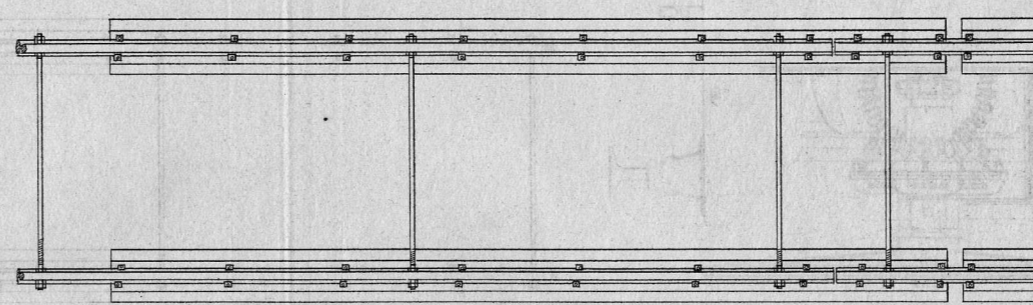


Fig. 13. Coupe transversale.

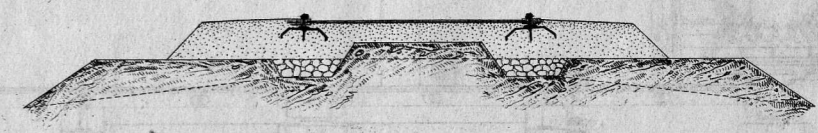


Fig. 10. Ech. 1/4

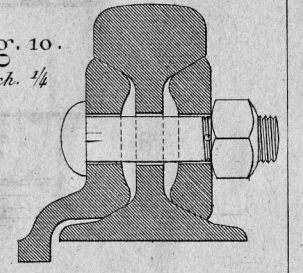


Fig. 11. Traversée de voies dite: Englische Weiche, d'Allemagne.

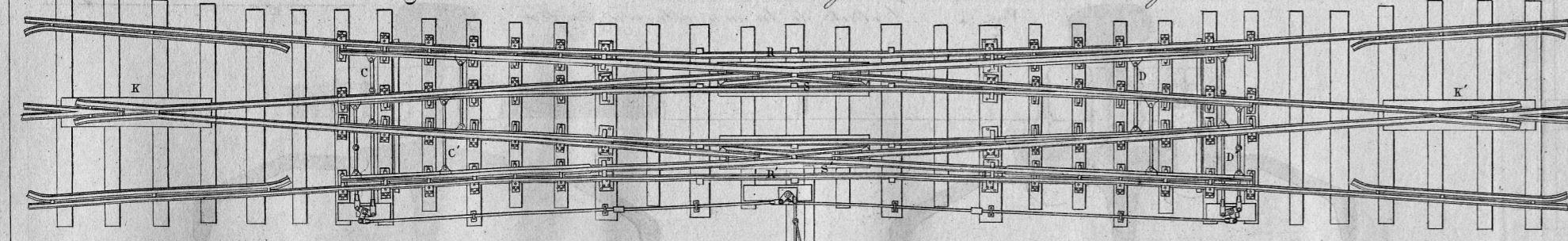
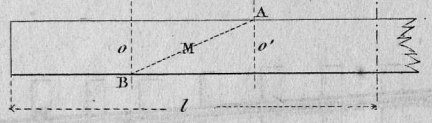
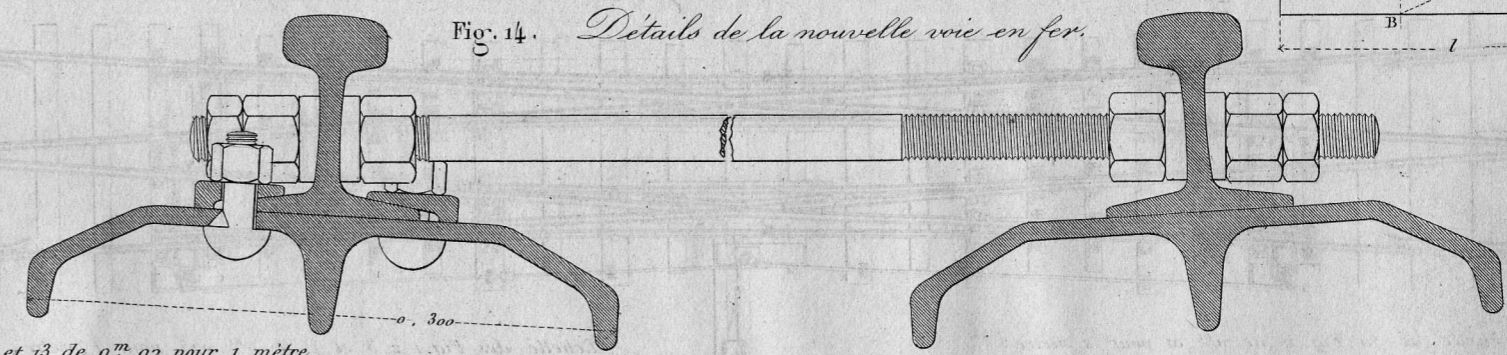


Fig. 14. Détails de la nouvelle voie en fer.

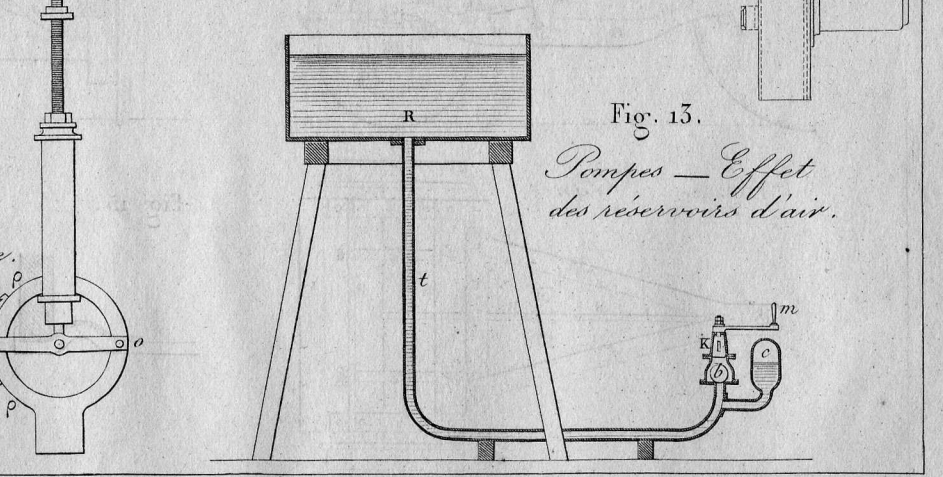
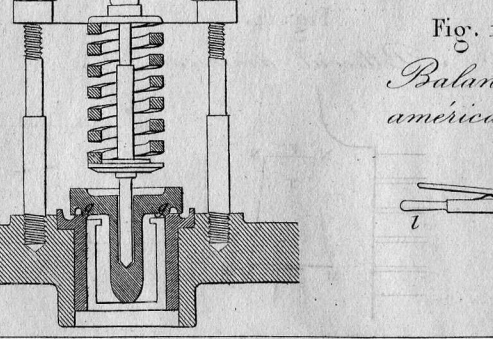
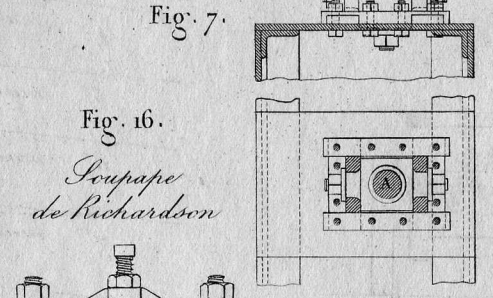
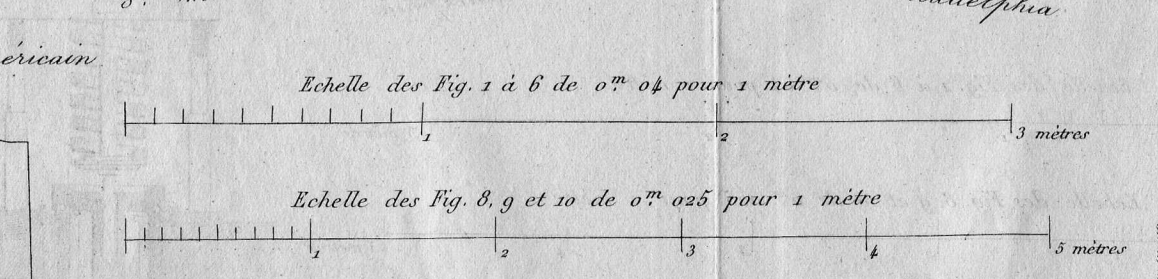
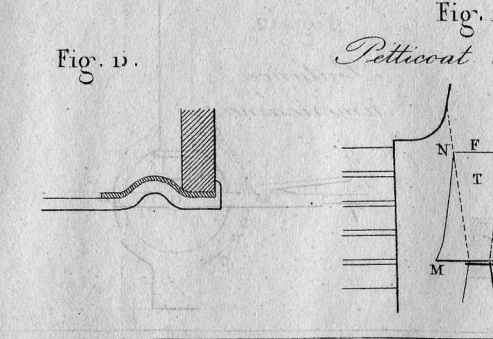
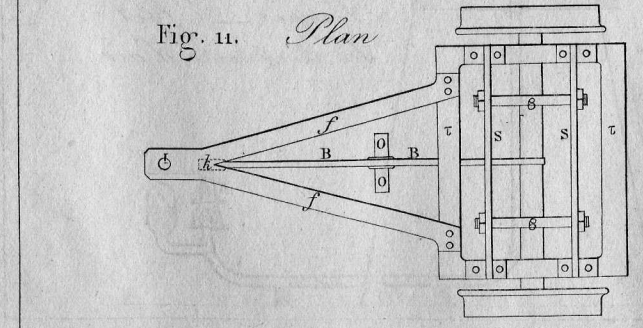
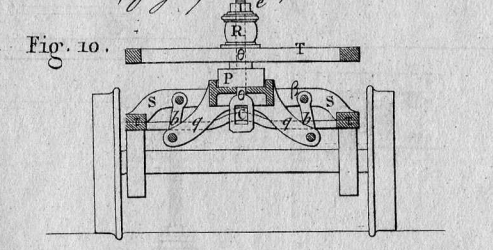
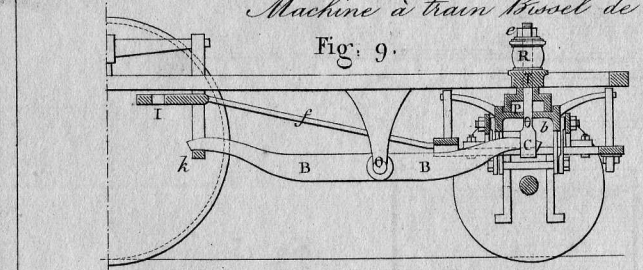
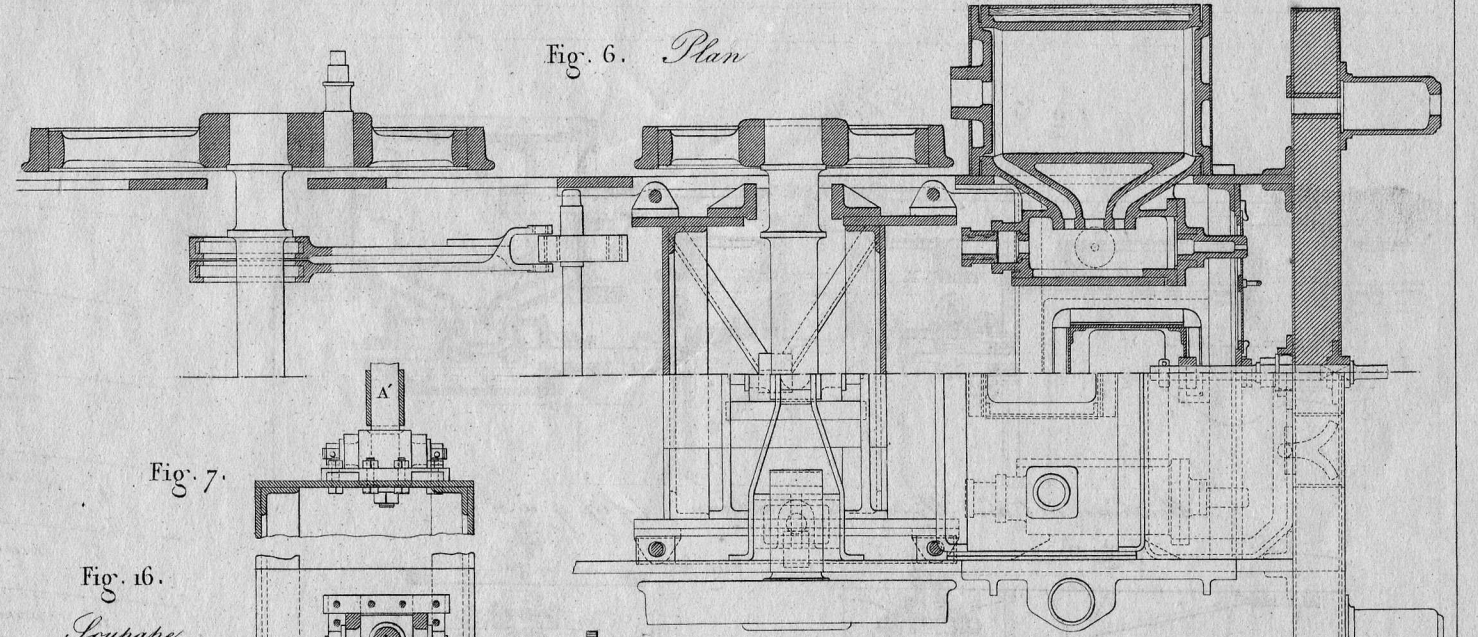
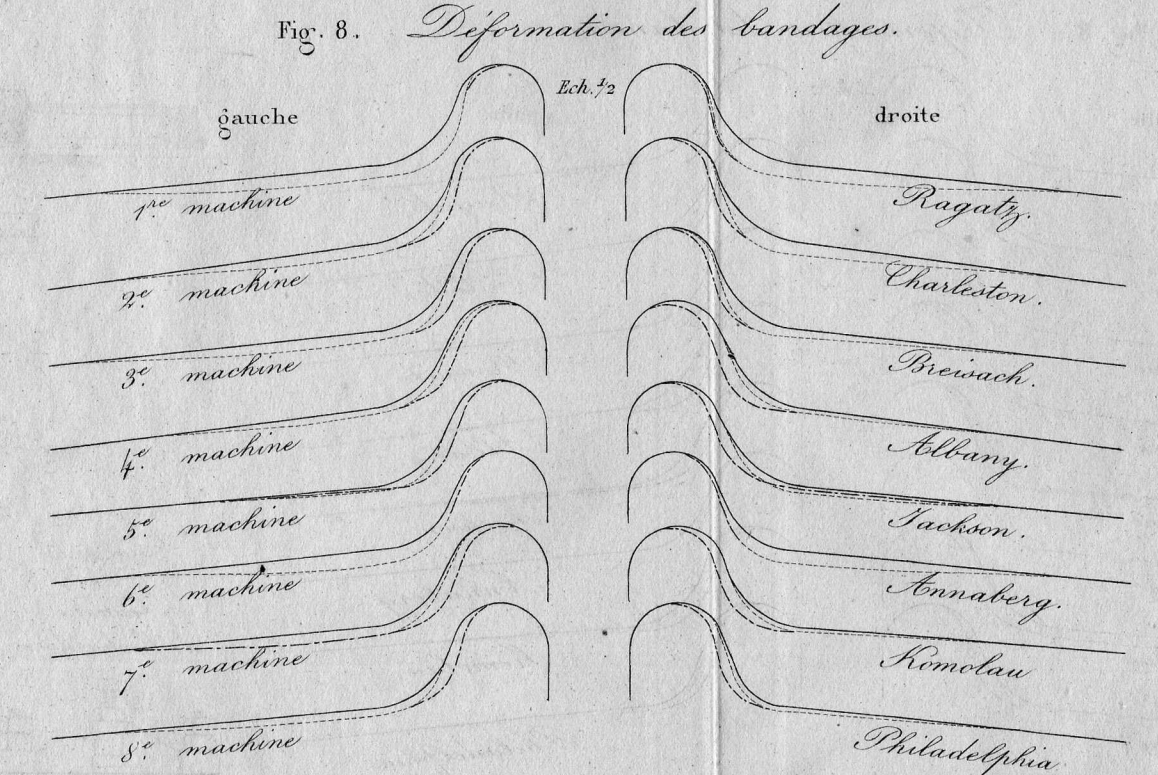
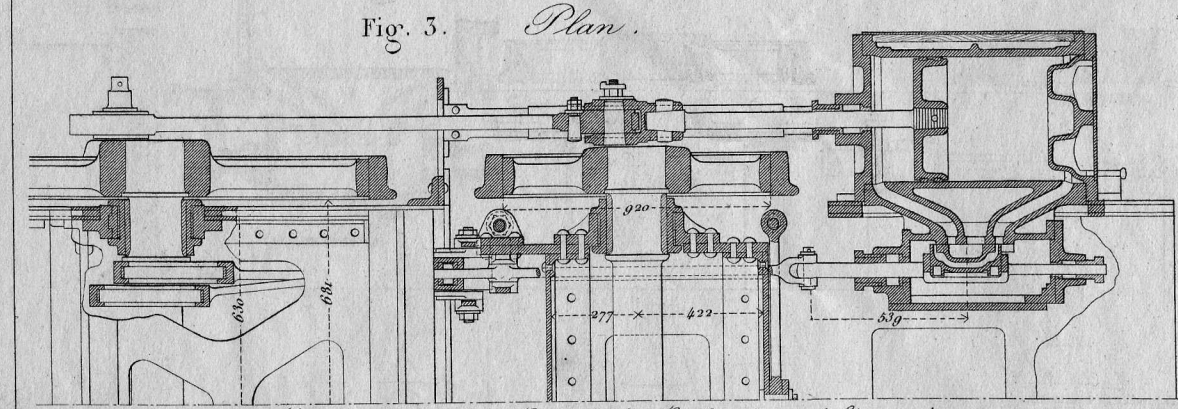
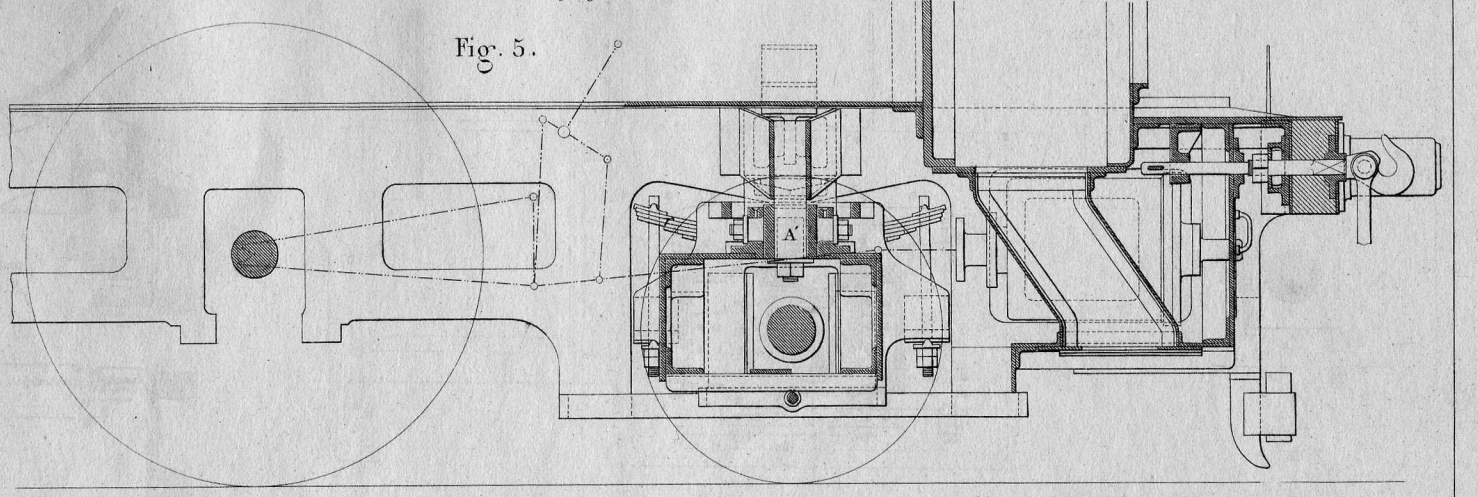
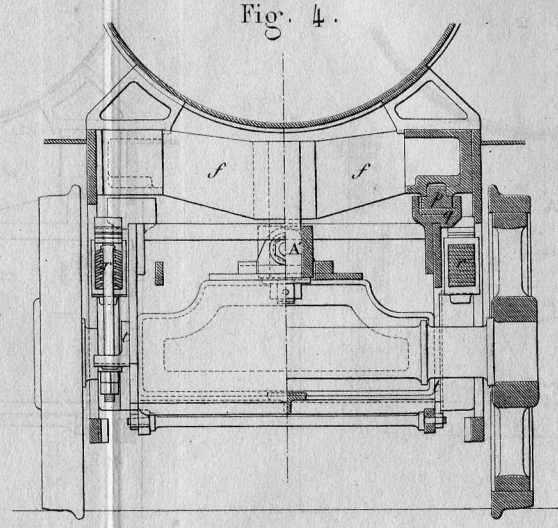
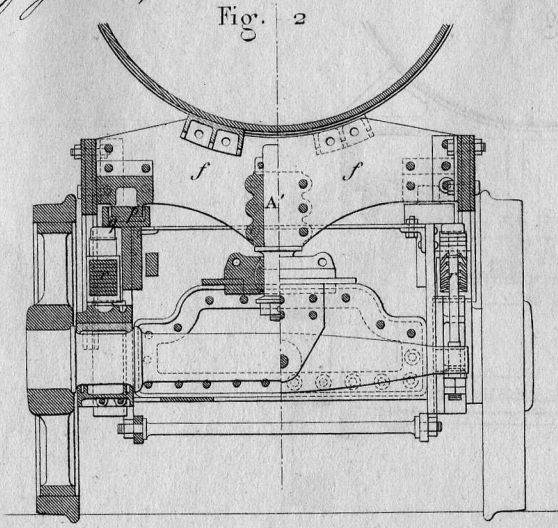
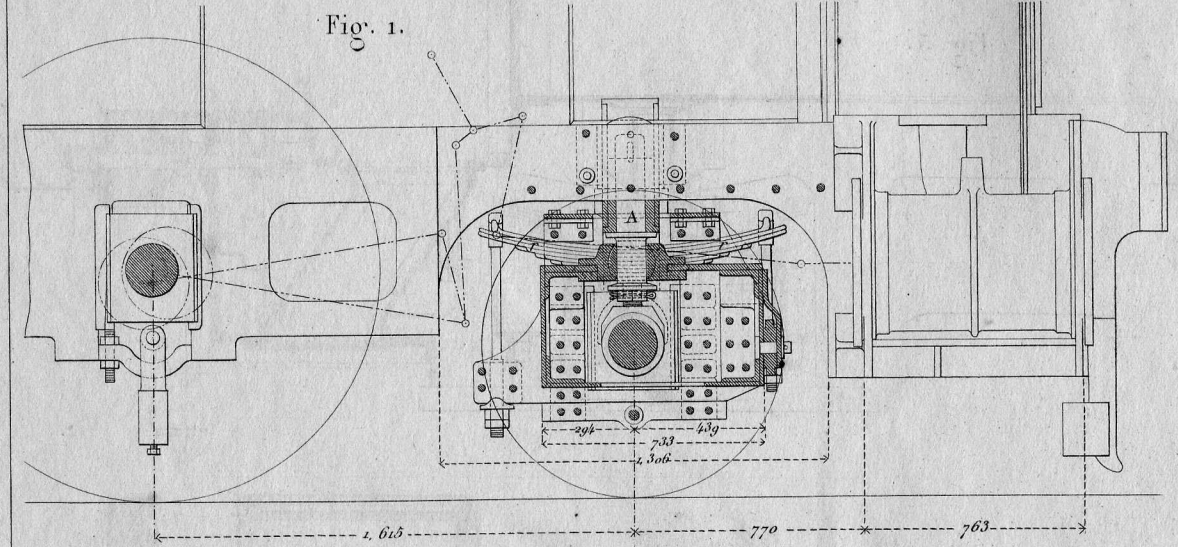


Echelle de la Fig. 11 de 0<sup>m</sup> 01 pour 1 mètre

Echelle des Fig. 1, 2, 3 et 4 de 0<sup>m</sup> 025 pour 1 mètre

Echelle des Fig. 12 et 13 de 0<sup>m</sup> 03 pour 1 mètre

*Courbes. — Machine de M. Novotny. — Avant-train articulé à un seul essieu à cheville-courrière médiane. (fig. 1 à 7.)  
Machines du chemin de Chemnitz à Komolan. (fig. 1 à 3.)  
Machines à voyageurs (fig. 4 à 6.)*



Chauffage des voitures par circulation d'air chaud; chemin de l'Est (figs. 1 à 6.)

Echelle des Fig. 1 à 4 et 7 à 9 de 0<sup>m</sup> 025 pour 1 mètre

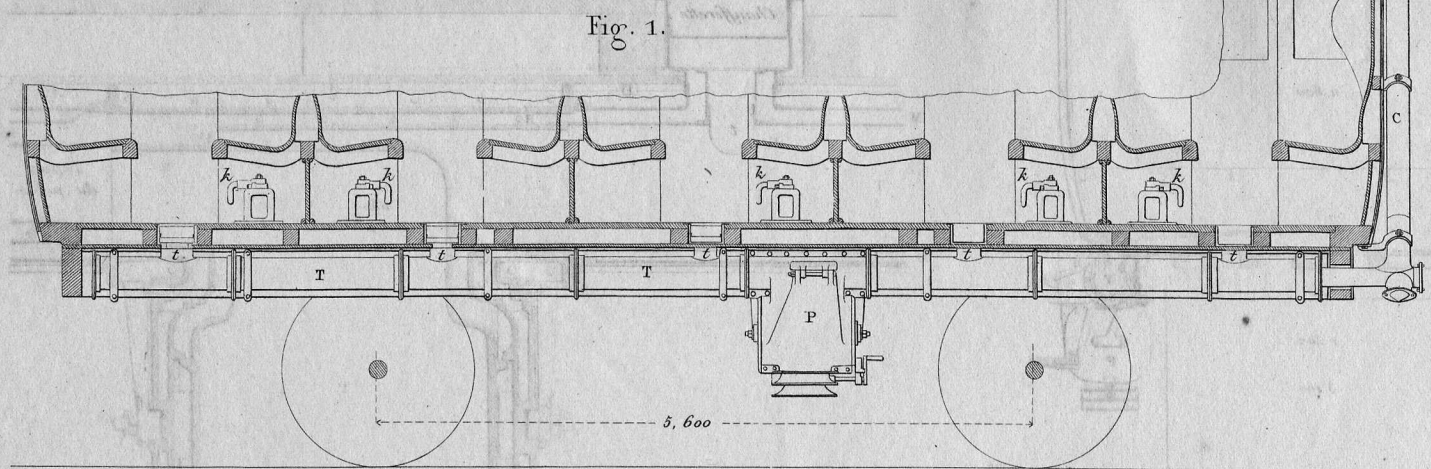


Fig. 1.

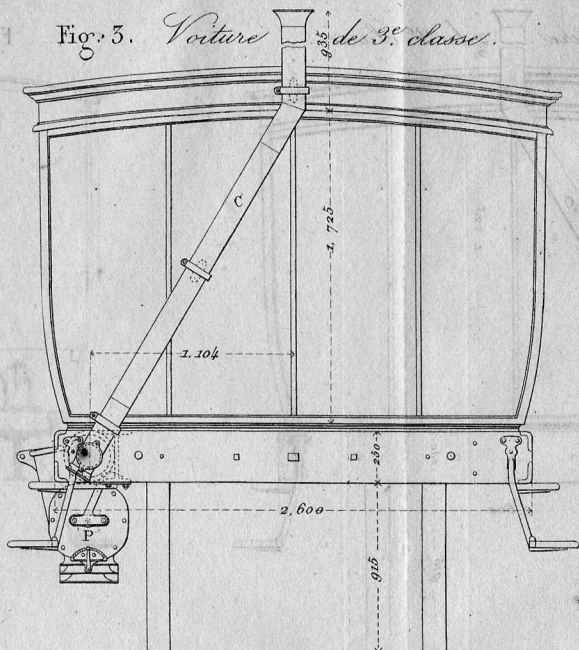


Fig. 3. Voiture de 3<sup>e</sup> classe.

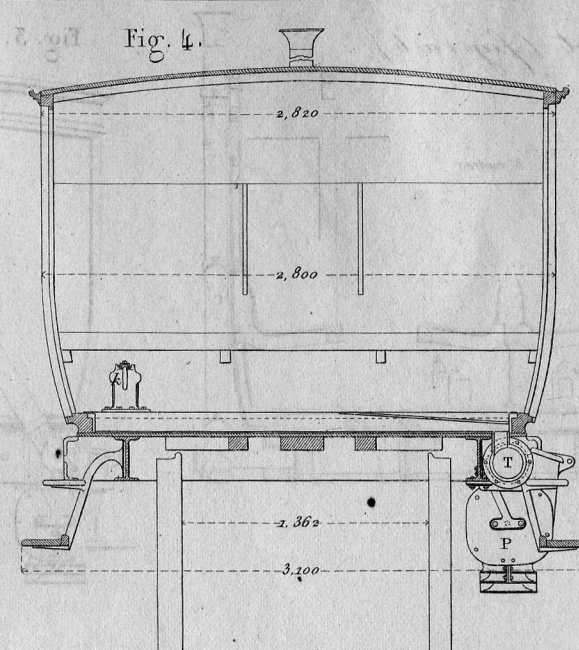


Fig. 4.

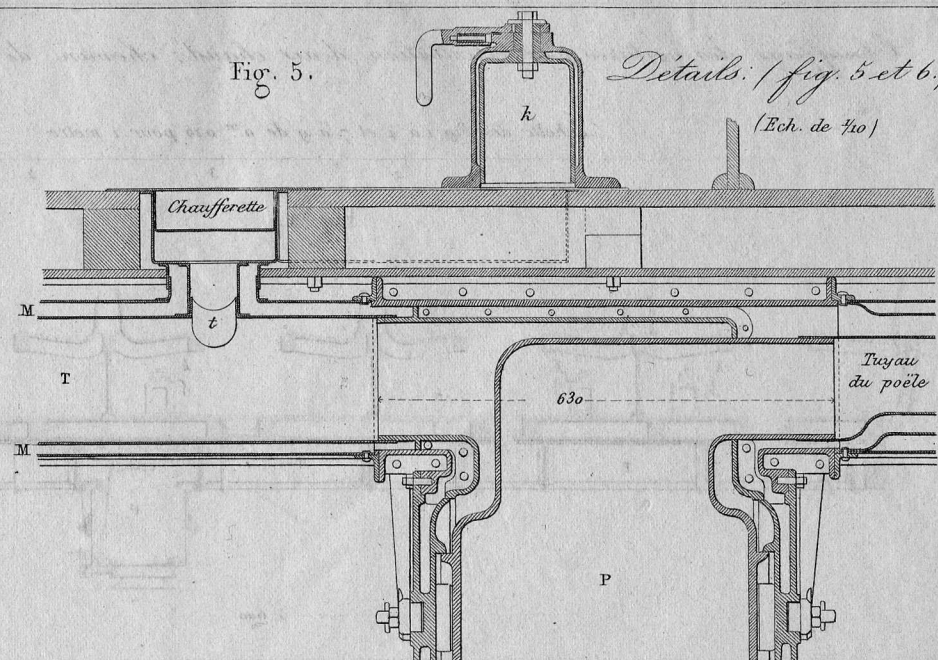


Fig. 5.

Détails (fig. 5 et 6.)  
(Ech. de 1/20)

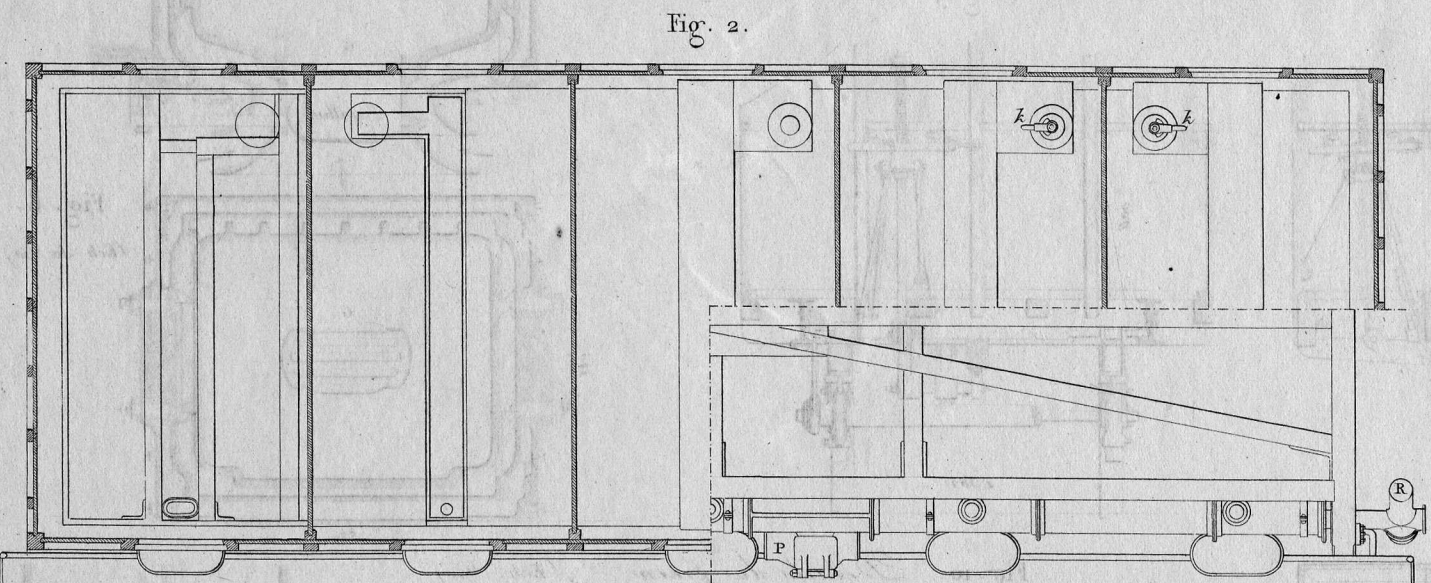


Fig. 2.

Frein à compensation automatique et périodique, de l'usure des sabots, de M. Dietz. (fig. 7 à 11.)

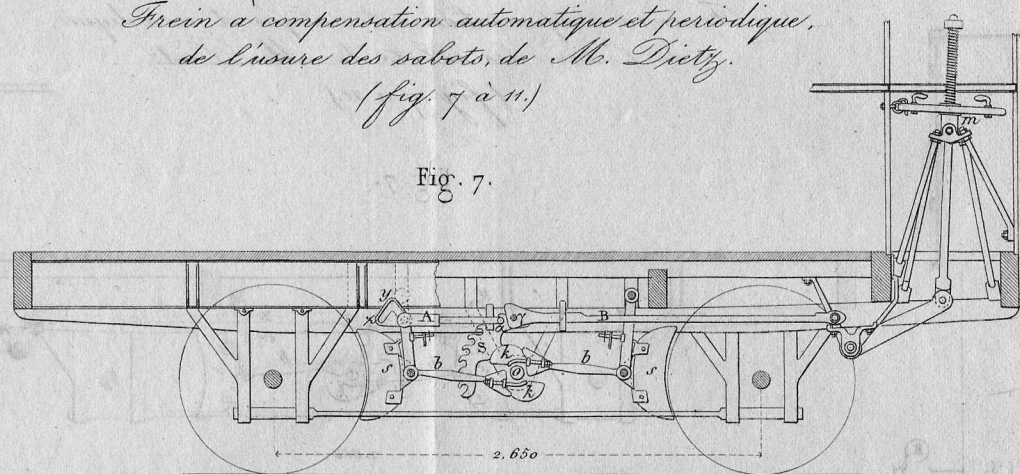


Fig. 7.

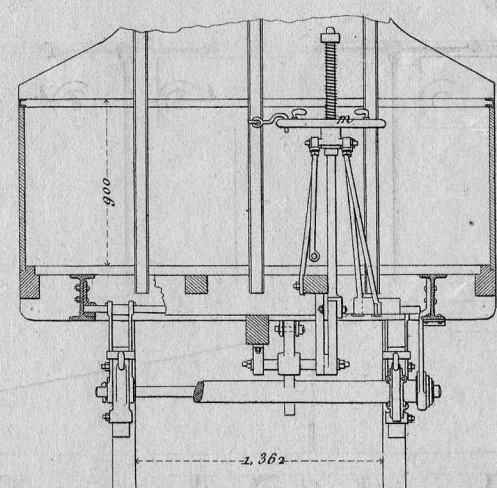


Fig. 9.

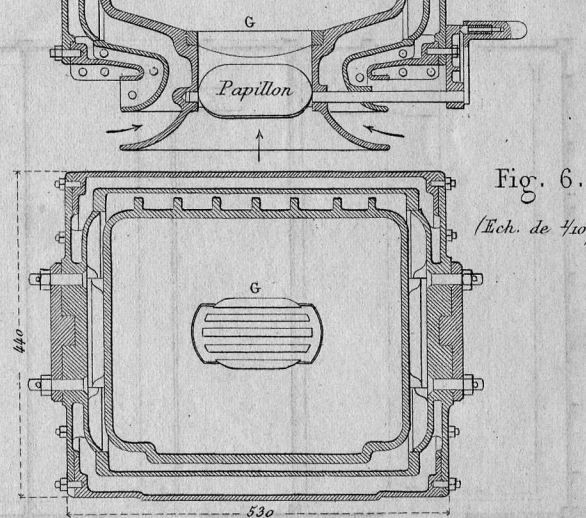


Fig. 6.

(Ech. de 1/20)

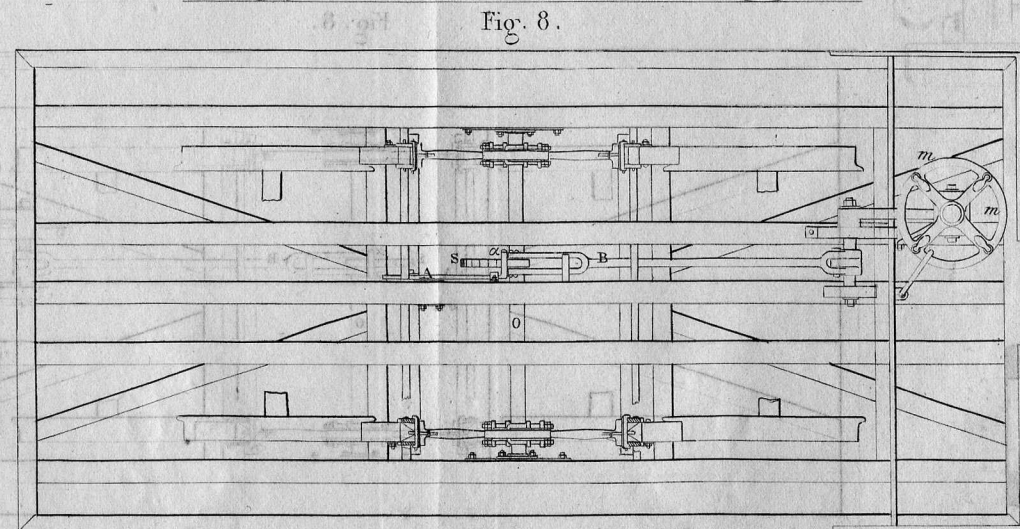


Fig. 8.

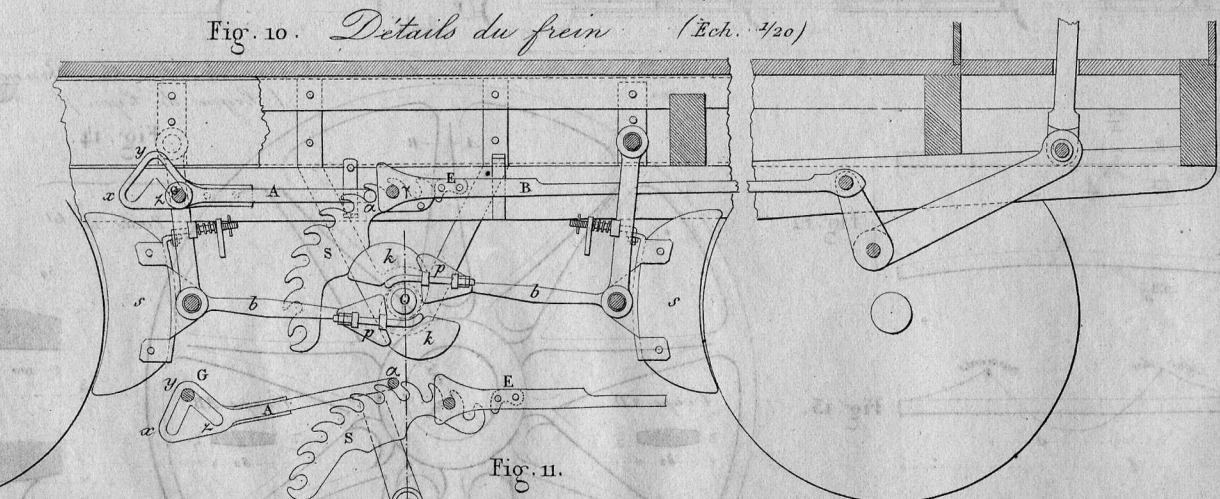


Fig. 10. Détails du frein (Ech. 1/20)

Fig. 11.

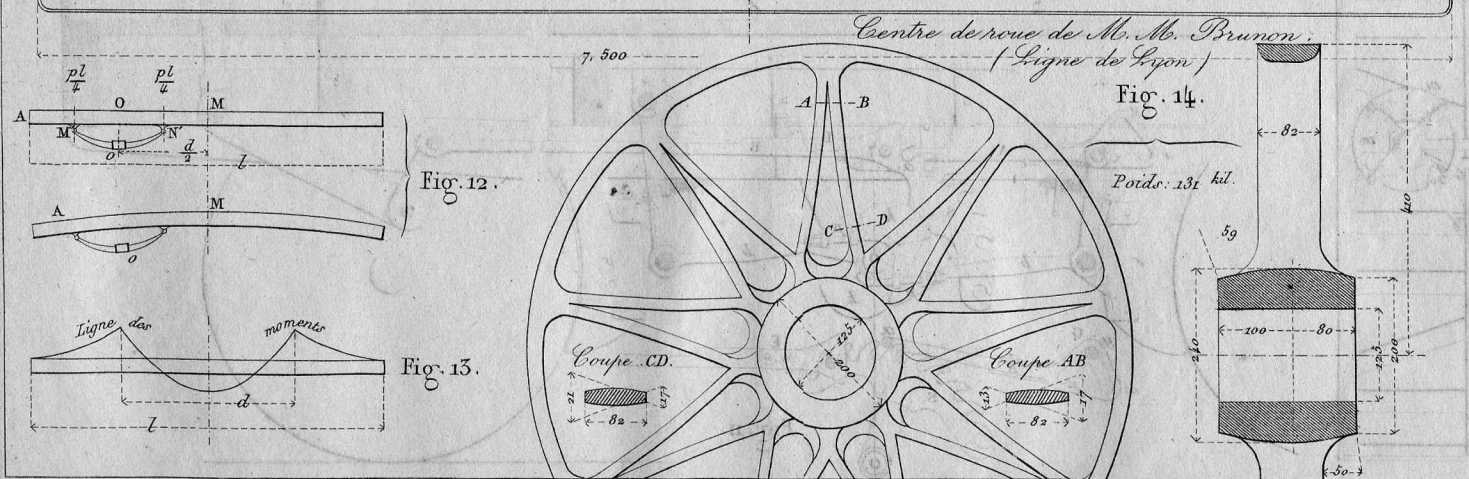


Fig. 12.

Fig. 13.

Fig. 14.