N° 13,505 A.D. 1899

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COMPLETE SPECIFICATION.

[Communicated from abroad by CRISPINO BONAGENTE, of Turin, in the Kingdom of Italy, Captain 7ª Brigata d'Artiglieria di Fortezza a Turin.]

Improvement in Mountings for Ordnance.

I, HENRY HARRIS LAKE, of the Firm of Haseltine, Lake & Co., Patent Agents, 45, Southampton Buildings, in the County of Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The mounting for siege guns which forms the subject of this invention consists of a number of arrangements which, when applied to the ordinary carriages of siege-guns, enables these latter to travel over uneven soft roads, while being in proper position for firing, so that on arriving near a fortress the ordnance can open fire immediately, such as is the case with field guns.

My improved mounting consists of the following parts, *viz.*:—

1. A pair of sectional endless rails mounted upon the gun carriage wheels, to form a firm bearing surface for the carriage both while travelling, as also during firing.

2. A recoil track for supporting the tail end of the gun-carriage during firing.

In addition to these main parts the following subordinate parts are provided, *viz.*:—

3. Two brake wedges for counteracting the recoil due to the firing and for effecting the immediate return of the gun.

4. Two longitudinal beams serving for supporting the recoil plank and the brake beam during travelling and also as a fulcrum to the lever bar when it is required to insert the same in the wheel-spokes.

5. Two cheeks or shoe-plates applied to the tail end of the gun carriage to render this part parallel.

6. A carriage brake in place of the ordinary wheel brake which had to be abandoned through the adoption of the endless rail on the wheels.

The improved gun mounting is particularly intended for use in connection with siege-guns but it may also be used for lighter ordnance. Although this improved transportable mounting renders the ordinary stationary mounting for heavy guns unnecessary, yet it may if desired be used in conjunction with a stationary mounting, which latter then may be of lighter construction than in ordinary cases.

I will now proceed to describe my invention by reference to the accompanying drawings, in which

Figure 1 is a side elevation, of my improved gun mounting in position for firing.

Figures 2 and 3 are a side elevation and an end-view respectively of my improved gun mounting ready for travelling on the road.

Figures 4 to 18 are detail views hereinafter referred to.

In the drawings the numerals 2 and 1 denote respectively the sections of the endless rail and the contact blocks attached thereto, which together form the

main parts of my travelling rail. 3 denotes the plank or track on which the tail end of the gun-carriage slides, and 4 denotes the wedge brake for checking the recoil.

In Figures 2 and 3 the numeral 5 shows the longitudinal beams, and 6 are the cheeks or shoe-plates provided at the tail end of the carriage beam.

The numerals 8, 9, 10 and 11 relate to parts of the carriage brake hereinafter described.

The endless rail according to this invention consists of a rail in the form of a polygon mounted upon the periphery of the carriage wheel and composed of hinged sections 2, 2, Figures 1 and 2. To each pivot pin 14 of the sections there is connected a block 1, and said blocks project beyond or surround the endless rail and are intended to come into contact with the ground.

This endless girdle rail is distinguished from those heretofore constructed not only by the adoption of the blocks 1 which impart to the rail great stability even when the wheel reposes on the joint between two rail-sections, but also by the form and arrangement of the joints, as well as by the form of the sections forming the rail, which parts are all so arranged as to reduce friction.

The more rail-segments there are, the smoother will be the motion of the wheel, but at the same time the supporting surface will be proportionately small. When the sections are formed straight it is necessary, that when the wheel comes to the end of one section, for the next following section to lay flat on the ground so as to obviate resistance to the motion of the wheel during its passage over the joint between such sections. With shorter sections, the wheel in passing over the joint receives a shock due to the next section having to move through an angle. This may be remedied either by bevelling the adjacent edges of the sections, or by concentrically curving the ends of the sections.

This bevelling or curving of the ends of the sections facilitates the passage of the wheel from one to the next section, and also the turning of the sections upon the pivots, while moreover preventing to some extent at least, the rattling noise caused by the sections, as also by the blocks, while in contact with the ground.

By providing these blocks 1, 1 (Figures 1 and 2) which are carried centrally on the pins 14 of the inner link-polygon 2, 2 the rail-sections are supplied with a convenient support, while at the same time provision is made to prevent, during the travel of the wheel from one section on to the other, one end from rising and the adjacent end from lowering.

The length of the blocks is advantageously a little shorter than that of the rail-sections or sides of the polygon.

The rail sections are by preference made in the form of channel irons adapted to receive the wheel rim.

The sides of the channel sections should be at an incline to the rolling surface.

The detail construction of the rail sections are shown in Figures 3, 4 and 5.

1^1 is a channel shaped body of steel plate engaging the wheel rim, which is thus caused to run on the bottom portion thereof. 2^1 is a wooden sole connected to the channel-section by bars 3^1 fixed by rivets 4^1 and by a rivet-headed bolt 5^1 respectively. 6^1 (Fig. 4) are iron stirrup pieces attached to the sole 2^1 by a bolt 7^1 and wood screw 8^1 and attached to the channel section 1^1 by means of rivets 9^1 in the flaps 10^1. One of the two stirrup pieces 6^1 is formed with eye pieces 11^1 fitted with bushes 12 of hardened steel kept in position by pins 13.

The opposite stirrups are formed with forks 15, 16, Fig. 5 provided with pins 14 which screw into the parts 16.

When the rail is mounted together, the eyes 11^1 of one section engage in the forks 15, 16, of the next section and assist in carrying the pins 14.

The protruding portions of the pins 14 enter into the eyes of the blocks 1 (Figure 1).

These pins 14 are prevented from unscrewing by means of an inserted rod 17 secured by cotter or split pin 18 Figure 4 and secured by its other end in a U shaped piece 19 by means of a spring cotter 20 see detail view Figure 6.

In order to obviate the noise occasioned by the rattling of the wheel rim in the rail sections I provide each rail section centrally with a two part rubber bolster 21 enclosed in an iron casing 22 see Figure 7. The two portions 26 and 27 of the rubber bolster have interposed between them an iron plate 28 furnished with guide pins 29.

The iron casing 22 is formed with two projections, one 23 of which bears against the lower side of the channel section, while the other 24 is held by the head of the safety bolt 25.

The details of the blocks connected to the rail sections are shown in Figures 8 to 12 of which Figure 12 is drawn to a larger scale.

In these figures 1^{11} is the wooden block, 2^{11} a steel plate taking the wear at the top, and 3^{11} are steel bands taking the wear and strengthening the block at the bottom.

4^{11} are wooden cheeks fixed to the block by screws 5^{11}. 6^{11} are the bearings for the pins 14 (Figure 5), provided with a cover 7^{11} adapted to turn on the bolt 5^{11}, which latter are provided with a safety device 8^{11} for securing the screw nuts 9^{11} of the covers 7^{11}. Springs 10^{11} are provided to press the head 11^{11} against the pin 14 when mounted in the bearing 6^{11}. 12^{1} are two rubber cushions secured to the upper side at both ends of the blocks by iron plates 13^{1} with wood screws 14^{1}. This cushion 12^{1} together with the springs 10^{11} are for the purpose of preventing noise between the rail-sections 2, 2, (Figure 1) and the blocks 1, 1; the noise being chiefly produced through the sudden tipping of the blocks while passing the top of the wheel.

Figure 13 shows how the blocks are mounted upon the rail.

Obviously the rail may be constructed entirely of iron and without any wood.

The plank or track for the tail end of the gun-carriage is shown in Figures 1 and 2, and 14 and 15 in which 1^{111} denotes the bottom plank protected at its underside by a steel plate 2^{111} and furnished at its upper side with a steel plate 3^{111} which takes the tail of the gun-carriage during firing. 4^{111} are the side cheeks and 5^{111} the ends of this track. 6^{111} are buffers at the rear end to brake the recoil, while 7^{111} are buffers at the front end which come into action on the return of the gun.

8^{111} and 9^{111} are bolts or studs at front and rear of the plank for the levers to act upon when training the gun.

10^{111} are similar bolts or studs for use in adjusting the plank towards the front or rear.

11^{11} and 12^{11} are eye-links and rings respectively for suspending the plank or track below the gun carriage during travelling, 13^{11} and 14^{11} are a bent piece and a ring respectively serving to manipulate the track.

15^{1} are connecting bolts and 16^{1} strengthening clamps.

When firing the gun with unusually heavy charges the tail of the gun-carriage slides on the track until it strikes against the rear buffers, whereupon the track is caused to participate in the rearward movement of the gun. At the return movement of the gun the carriage slides forward upon the track until it strikes against the front buffers and then takes the track along with it to its initial position.

The relative movement of the tail of the carriage upon the track can be variously adjusted as may be desired by placing the tail more or less towards the front of the track, or to the rear thereof as the case may be. The relative movement may also, if desired, be nought, so that the plank participates in the entire carriage movement.

As already stated, the longitudinal beams 5 Figure 2 of the gun-carriage, support during travelling the carriage-track as shown at Figures 2 and 3, and when it is desired to shift the gun in a forward direction by the aid of levers, such levers may be applied against the beams and between the wheel-spokes.

For the purpose of guiding the gun-carriage end between the sides of the track during recoil it is necessary for the end of the gun-carriage to have parallel

sides, and this may be effected by wooden or iron cheeks 6 (Figure 2) which are fixed to the tail end of the carriage.

The wedge-shaped recoil brakes 4 (Figures 1, 2 and 16), are made with a broader base 1^4 than usual, and at the rear end are provided with double spurs 2^4 to prevent the brake moving. At the upper end they are formed with a projection 3^4 which stops the carriage-wheels in their upward motion.

The special arrangement of brake for travelling, replacing the ordinary wheel brake which is useless in connection with the endless rail, is shown in Figures 2 3, 17 and 18.

To each of the carriage wheels is secured a ring 8 the flange of which is adapted to be acted upon by brake blocks 9^a fixed to hollow cross beams 9, 9, one of which is fast to the guide 10 while the other is adapted to slide therein by turning a brake screw 11 so as to either apply or to loosen the brake. The brake is suspended from the beams 5 of the gun-carriage.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, as communicated to me by my foreign correspondent, I declare that what I claim is:—

1. A movable track for gun-carriages, and particularly for heavy ordnance, by the use of which ordinary wheel carriages are enabled to travel over uneven loose roads and take up any firing position without preliminary preparations, the said track comprising jointed endless rails mounted on the carriage-wheels and a plank for supporting the tail-end of the gun-carriage during firing, such plank being adapted to be suspended by means of eyes, rings and the like, from the front of the gun carriage.

2. In jointed endless rails for and rotating with the wheels of gun-carriages as claimed in Claim 1, the arrangement of blocks suspended to the pivots of the rail sections and forming an uninterrupted supporting plane for the wheels, when the latter are located upon the joint between any two rail sections.

3. In pivoted endless rails as claimed in Claim 2, arranging the axis of the pivots outside the rolling plane, and slotted eyes in the rail sections for the reception of these pivots, arranged in such a manner as to cause the rail sections to repose symmetrically upon the wheel rim and without sliding thereupon.

4. The use of sections having bevelled, or curved ends, for jointed rails as claimed in Claim 2, for facilitating the passage of the wheel from one to the next rail section.

5. Jointed rails as claimed in Claim 2 having sections which are wider at the top than at the base.

6. In jointed rails as claimed in Claim 2 the arrangement of channel shaped blocks applied to the joints of the rail sections.

7. In the movable track as claimed in Claim 1, the use of a jointed endless rail constructed in the manner set forth with reference to Claims 2 to 6, a safety locking device for securing the blocks to the pivots of the rail sections, and consisting of a bent wire (17) with split pin (18) at one end, and of a U-spring wire (20) passing through a slotted U-shaped piece (19) engaging the free end of such bent wire (17), so arranged as to allow of a speedy fastening or unfastening of the blocks.

8. In the movable track for ordnance as claimed in Claim 1, the use of endless jointed-rails constructed in accordance with Claims 2 to 7 with the arrangement for each rail section of a suitably protected fixed rubber cushion or bolster in the floor of said rail section for preventing noise between the wheel and rail.

9. In the movable track for ordnance as claimed in Claim 1, the use of endless jointed-rails constructed in acordance with Claims 2 to 7, with the arrangement of rubber cushions in the ends of the sliding track for preventing noise between the rail sections and blocks.

10. In the movable track for ordnance as claimed in Claim 1, the use of endless jointed-rails constructed in accordance with Claims 2 to 7 having blocks formed

with bearings adapted to engage the pivots of the rail sections, and having springs which press these pivots constantly against the swivelling cover of the bearing.

11. In the movable track for ordnance as claimed in Claim 1, a sliding track for the tail-end of the gun-carriage during firing, provided with studs serving for adjusting its position, and with buffers for the recoil of the gun carriage, and arranged to be suspended during travelling below the fore end of the gun carriage.

12. In a movable track for ordnance as claimed in Claim 1, the arrangement of longitudinal beams on the gun carriage for supporting the sliding track during travelling.

13. In a movable track for ordnance as claimed in Claim 1, the arrangement of parallel cheeks for the tail-end of the gun carriage to cause the latter to be properly guided in the sliding track.

14. In a movable track for ordnance as claimed in Claim 1, the arrangement of wedge-shaped recoil brakes having spurs at the rear to grip the ground, and projecting pieces or stops at the top for increasing the effect of braking.

15. In a movable track for ordnance as claimed in Claim 1, the arrangement of a wheel brake for travelling and acting upon special rings secured to the carriage wheels.

Dated this 29th day of June 1899.

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Agents for the Applicant.

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A.D. 1899. JUNE 29. N° 13,505.
LAKE'S COMPLETE SPECIFICATION.

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SHEET 1

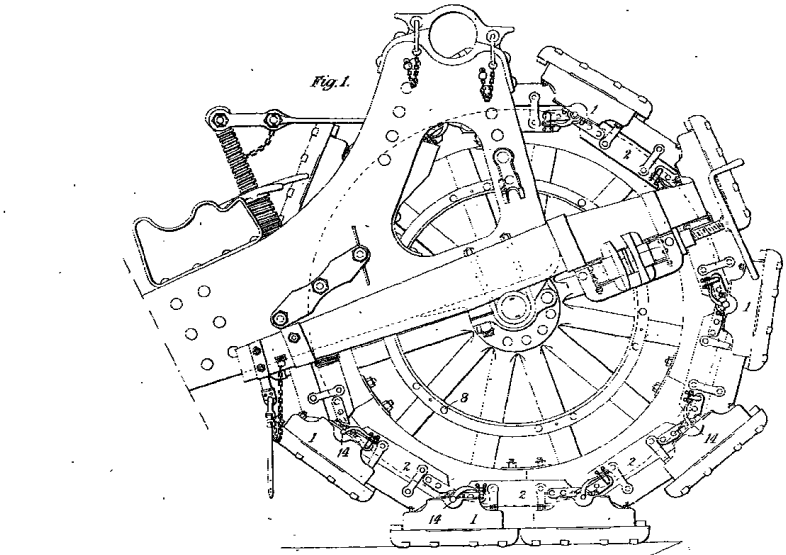

Fig. 1.

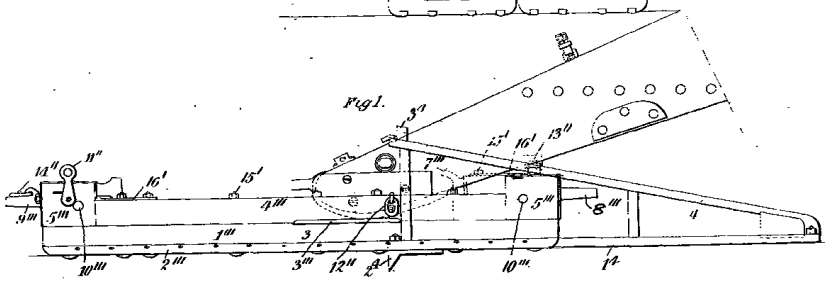

Fig 1.

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Fig. 1.

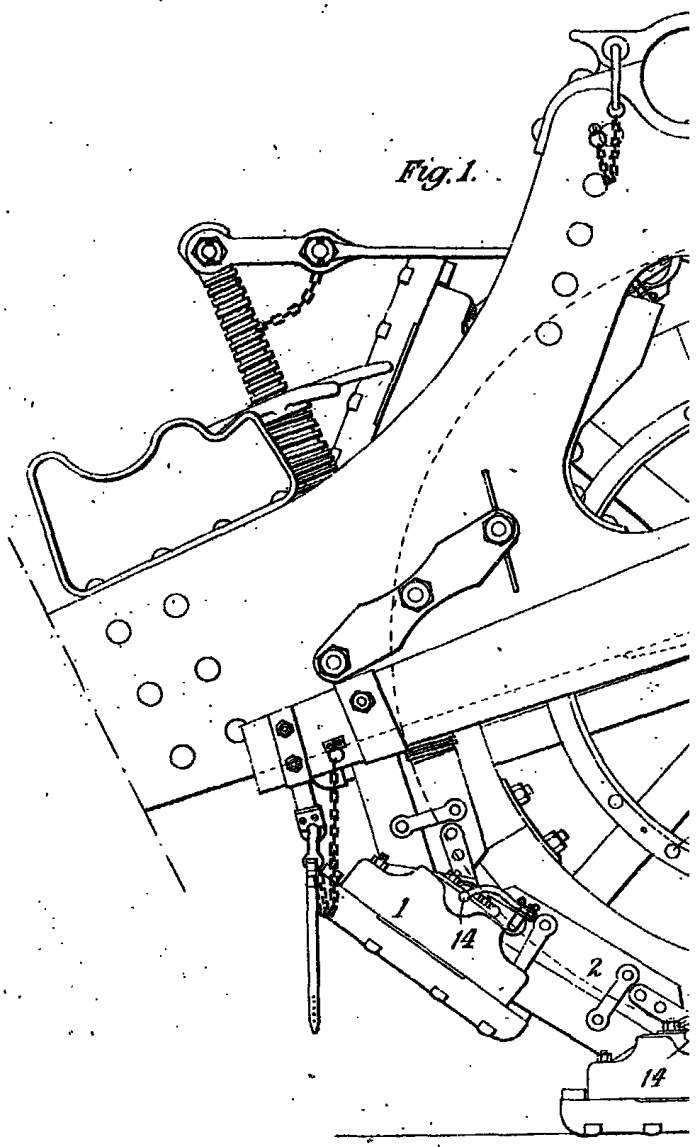
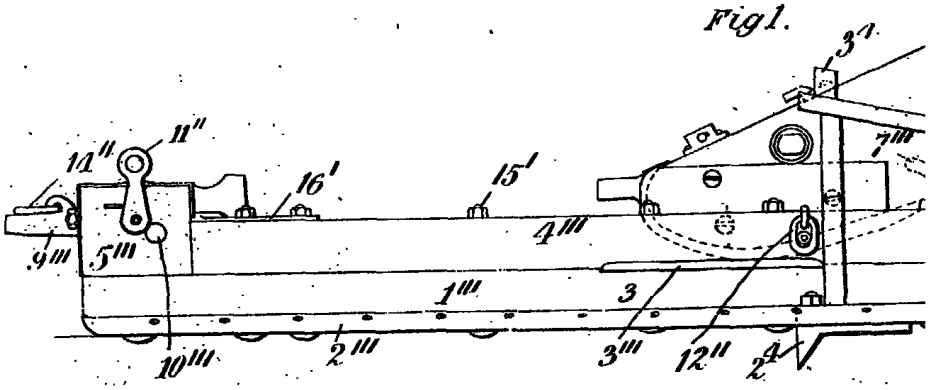
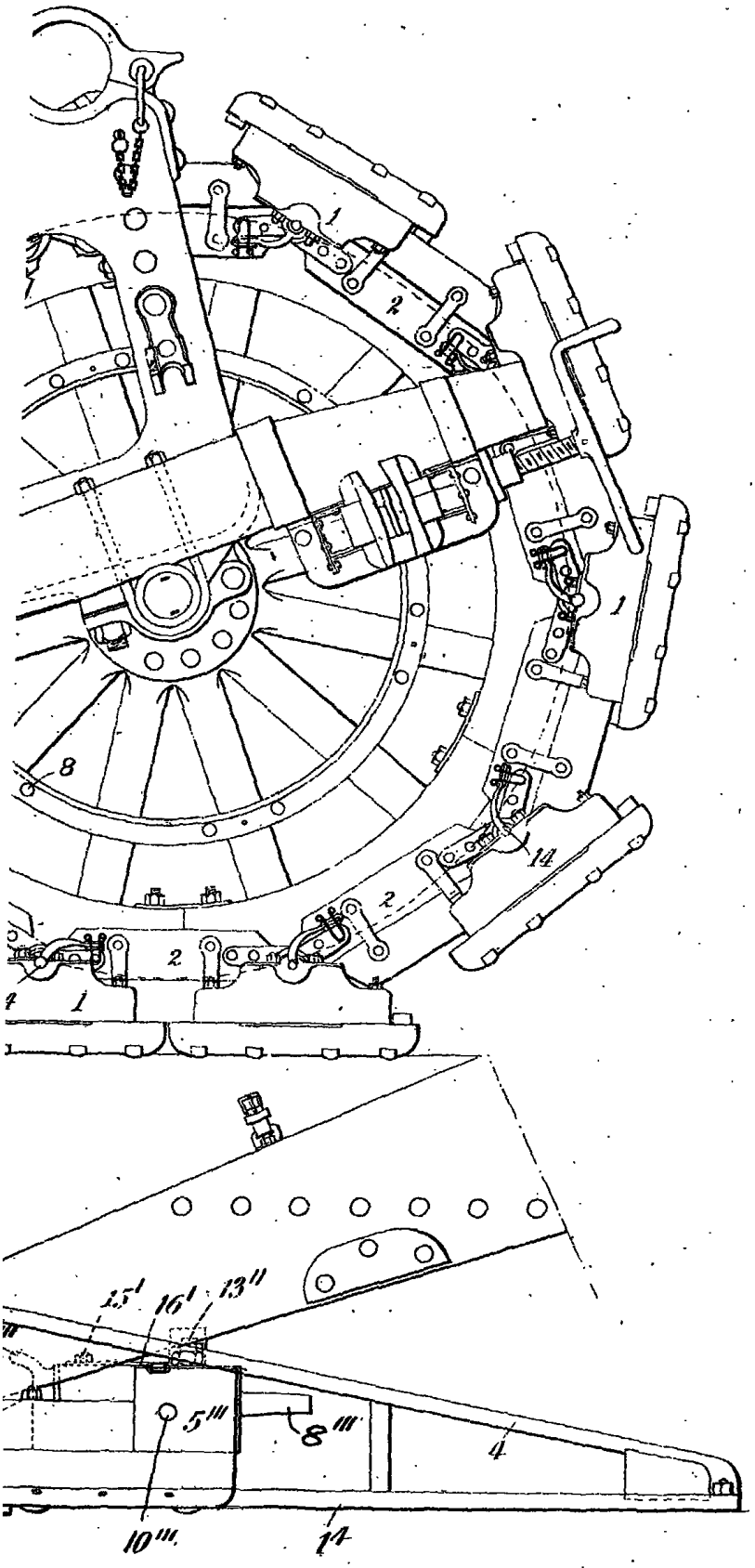


Fig 1.





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LAKE'S COMPLETE SPECIFICATION.

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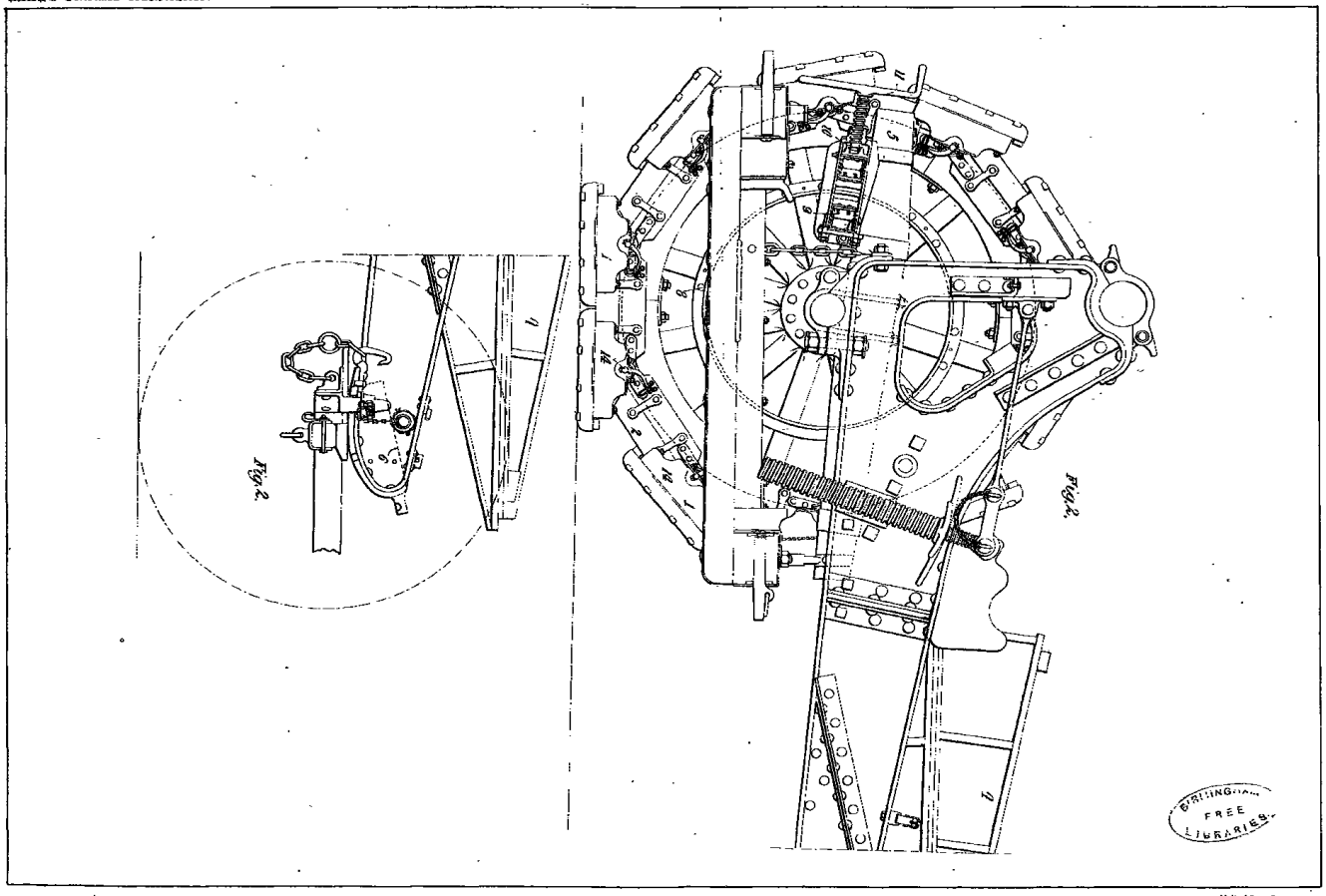

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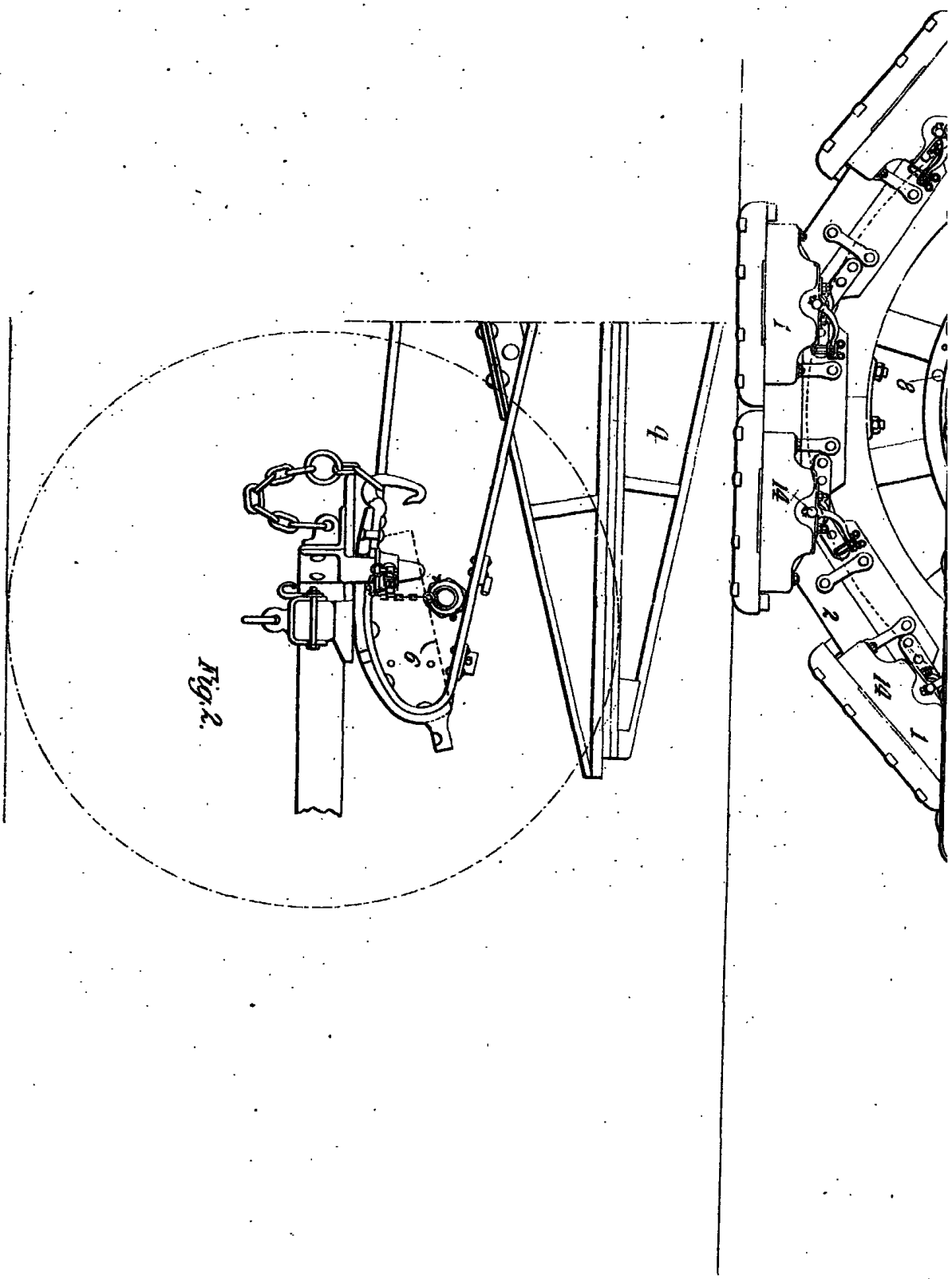

Fig. 2.

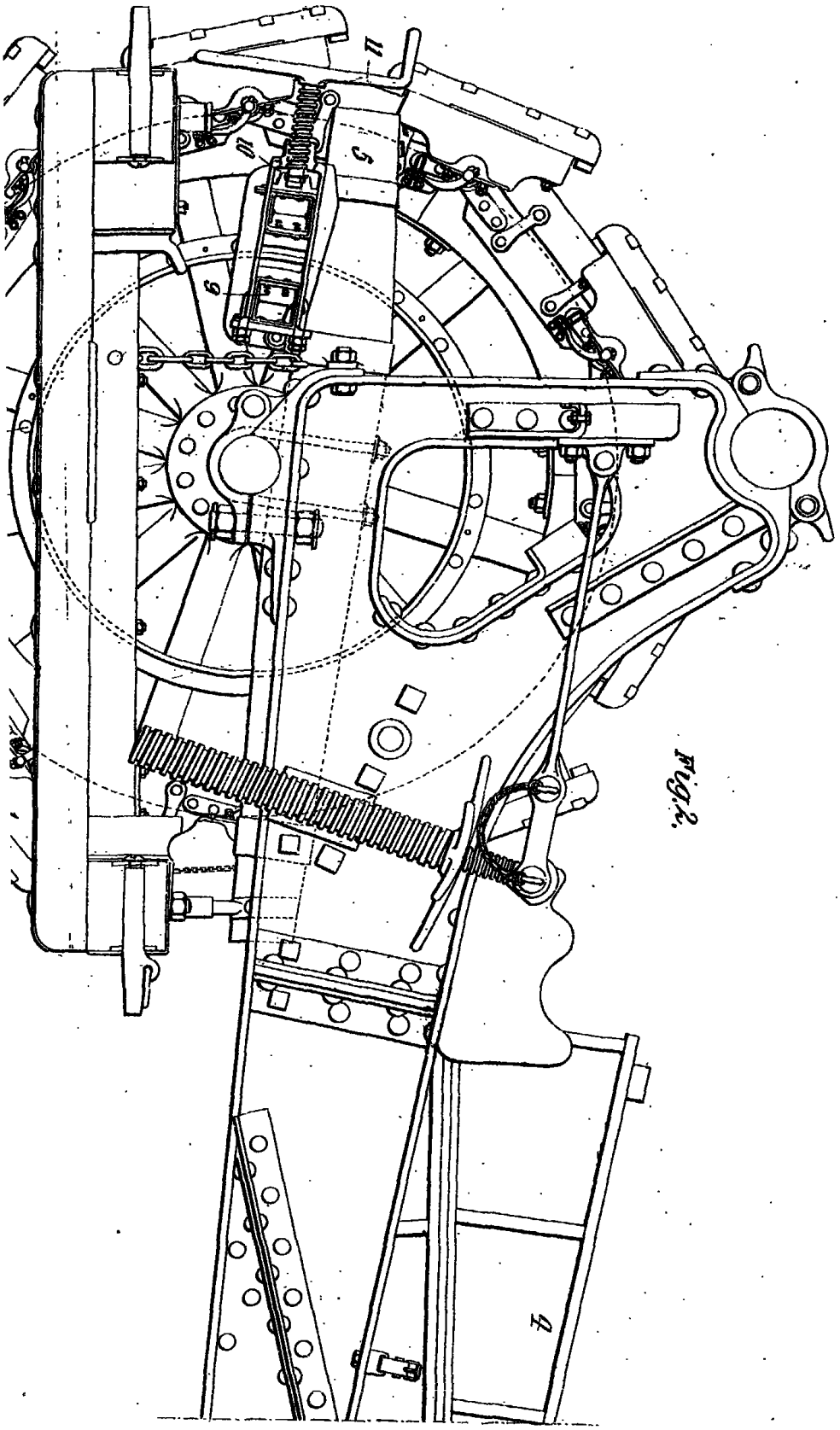

Fig. 2.

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SHEET 3

Fig.3.

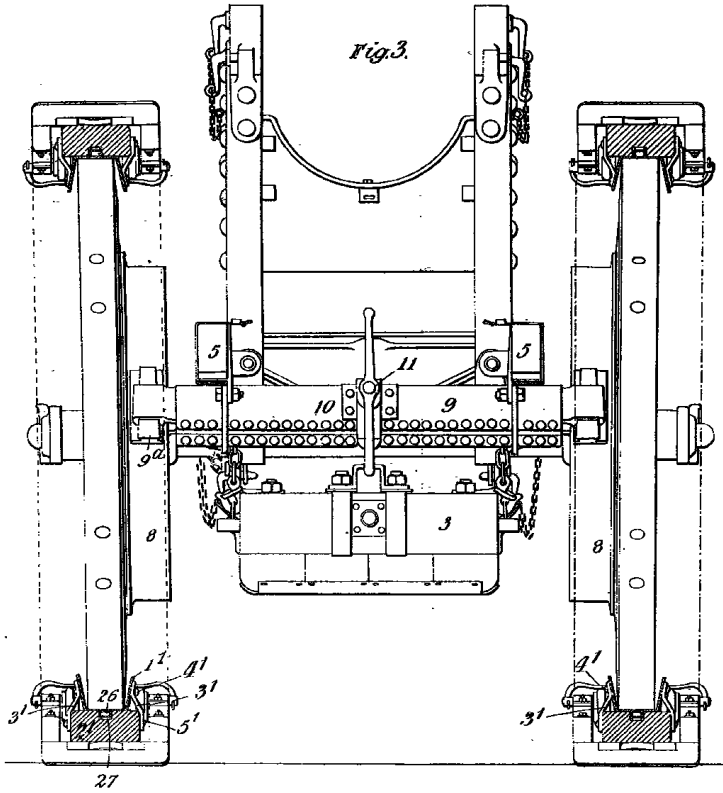

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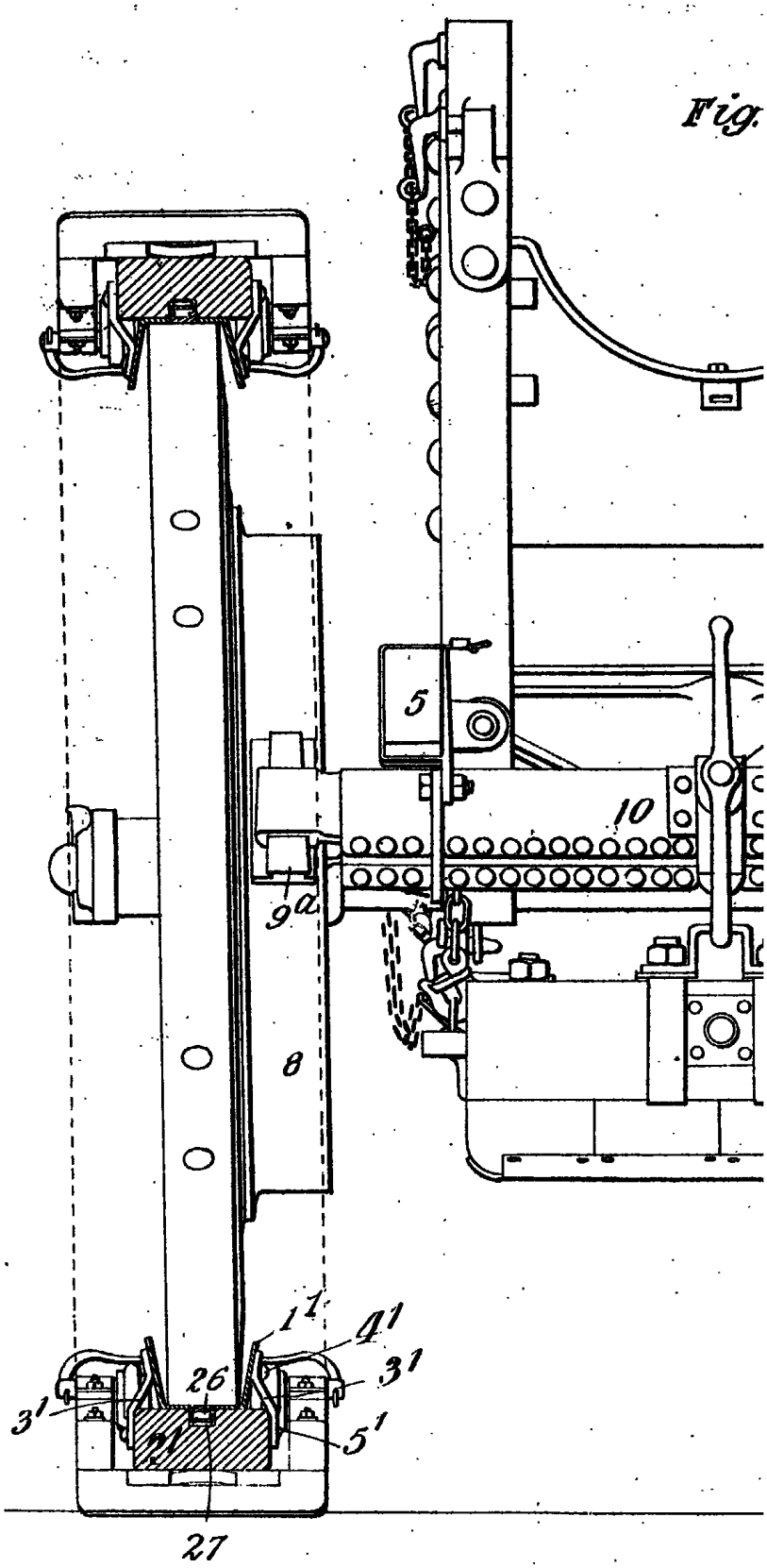
Fig.



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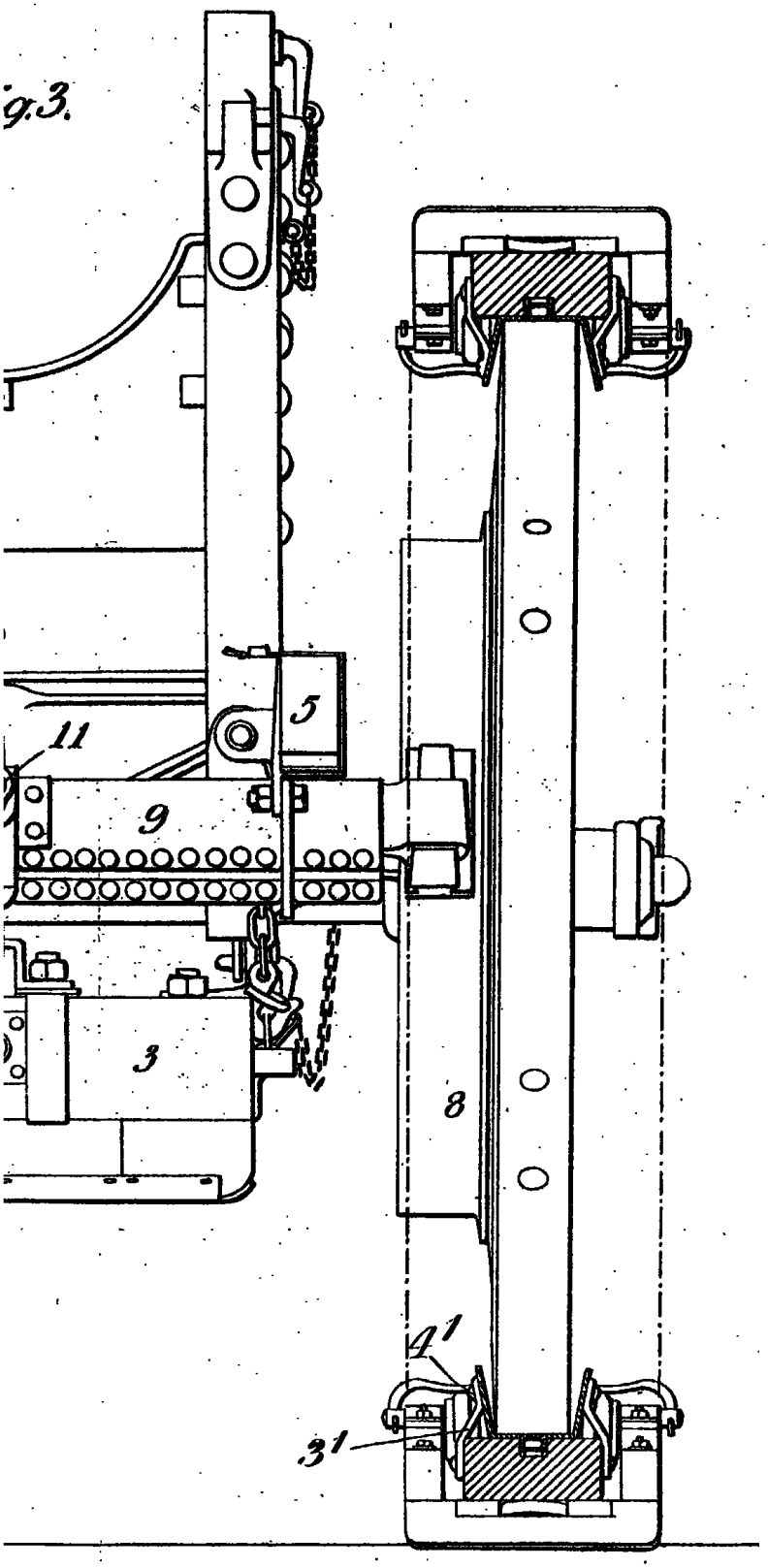

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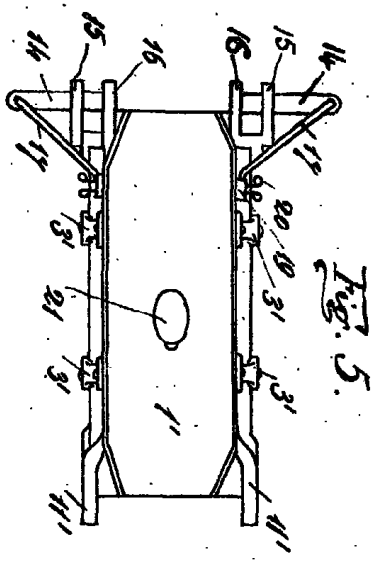


Fig. 5.

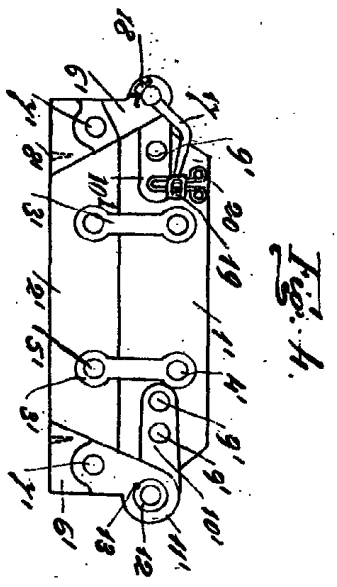
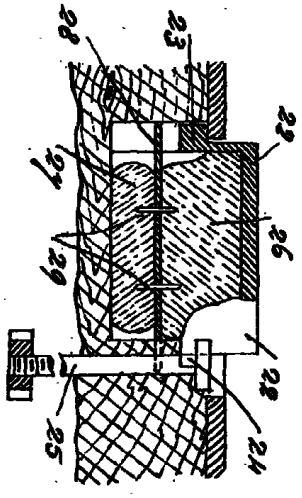


Fig. 4.



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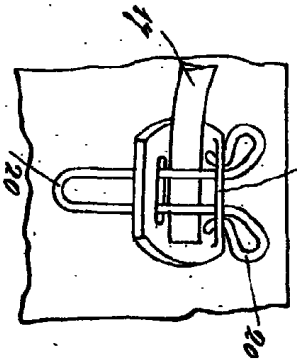

Fig. 6.

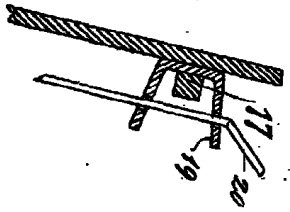

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Fig. 8.

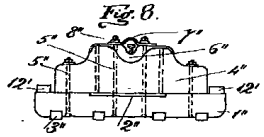


Fig. 10.

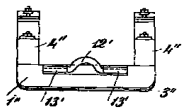
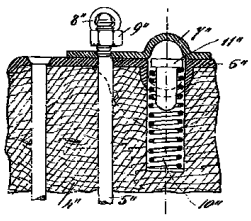


Fig. 12.



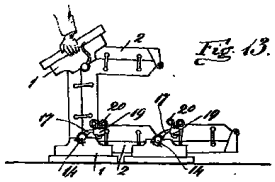
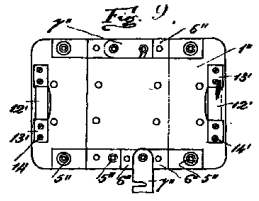


Fig. 13.

Fig. 9.



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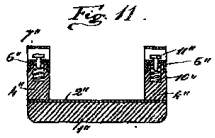
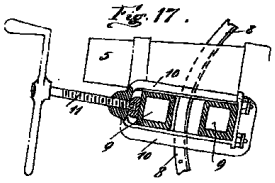


Fig. 17.



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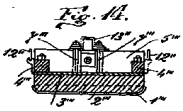

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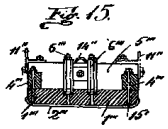

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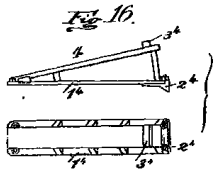

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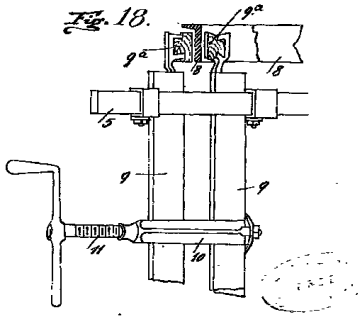

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Fig. 8.

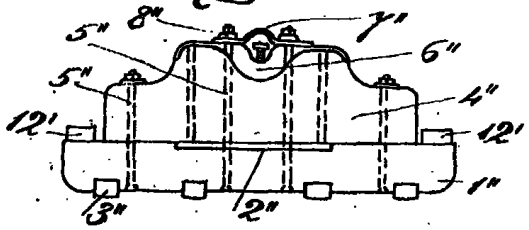
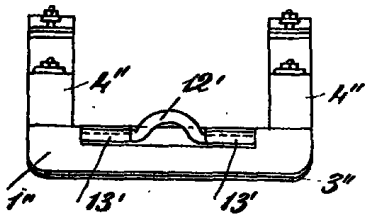


Fig. 10.



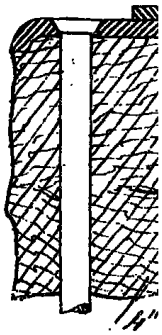


Fig. 9.

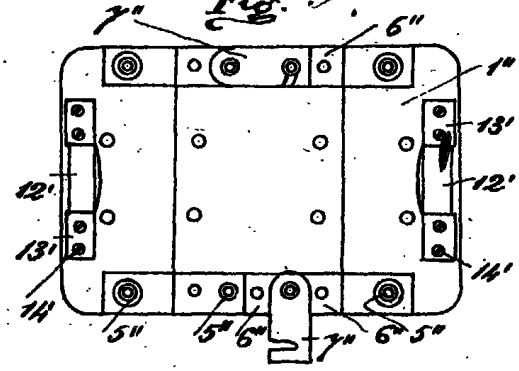


Fig. 11.

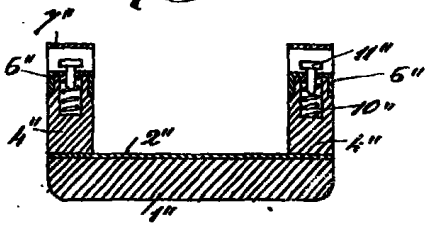


Fig. 14.

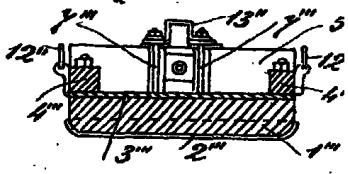


Fig. 15.

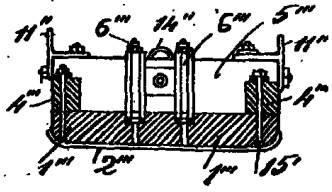
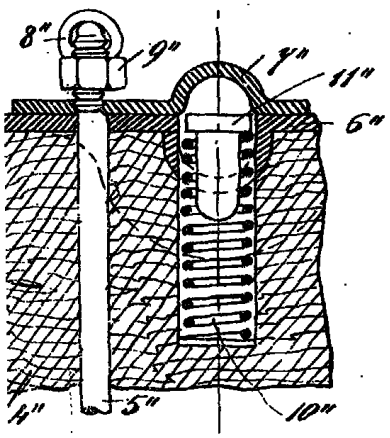


Fig. 12.



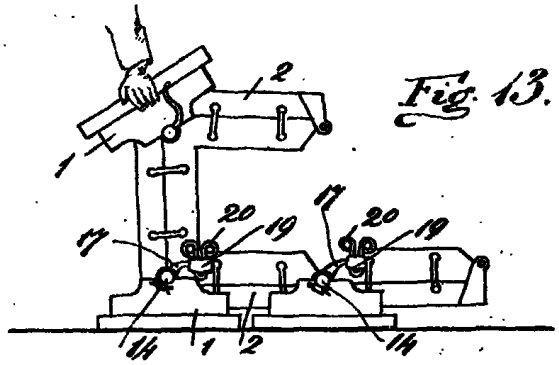
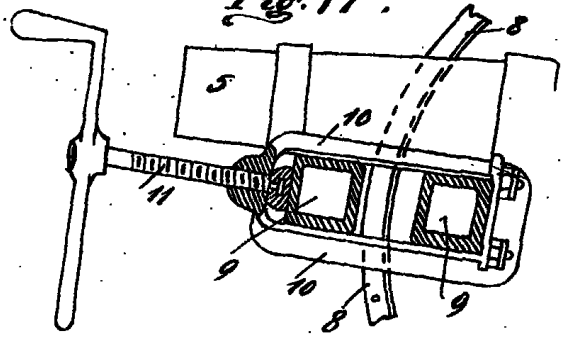


Fig. 13.

Fig. 17.



5"
12"
4"
1"

Fig. 16.

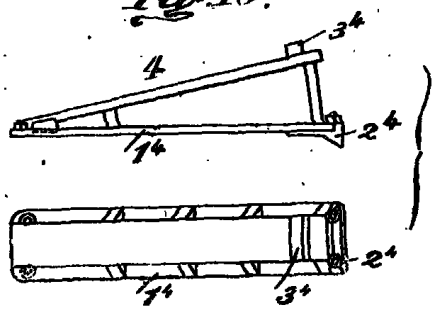
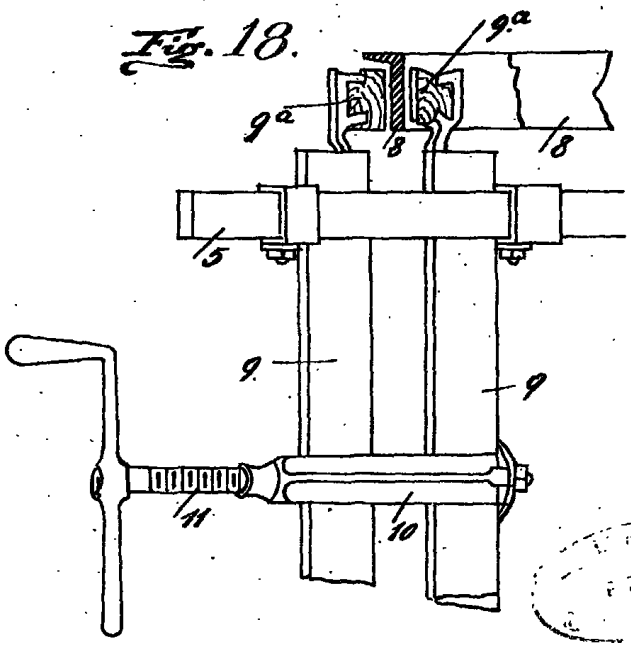


Fig. 18.



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