

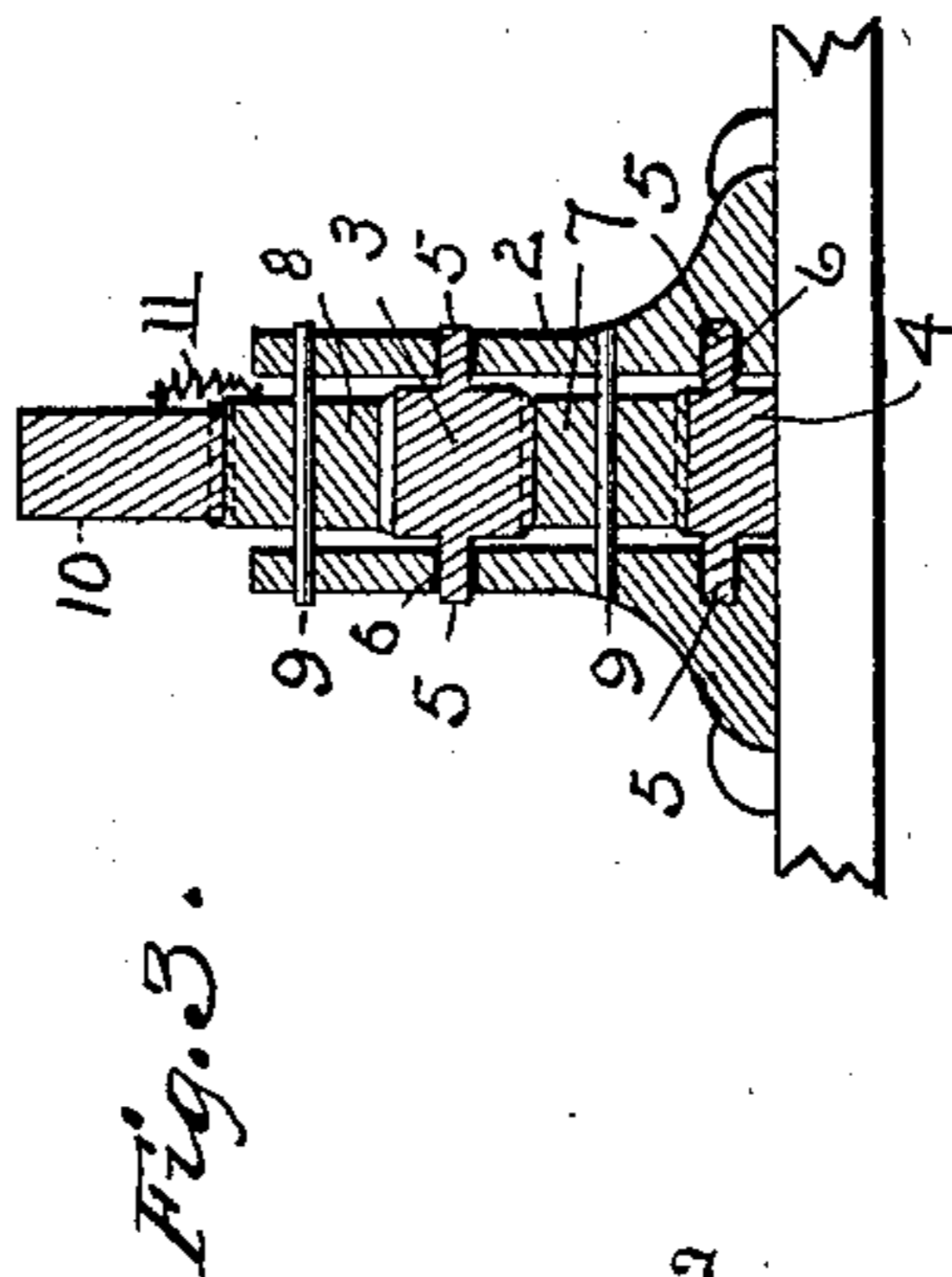
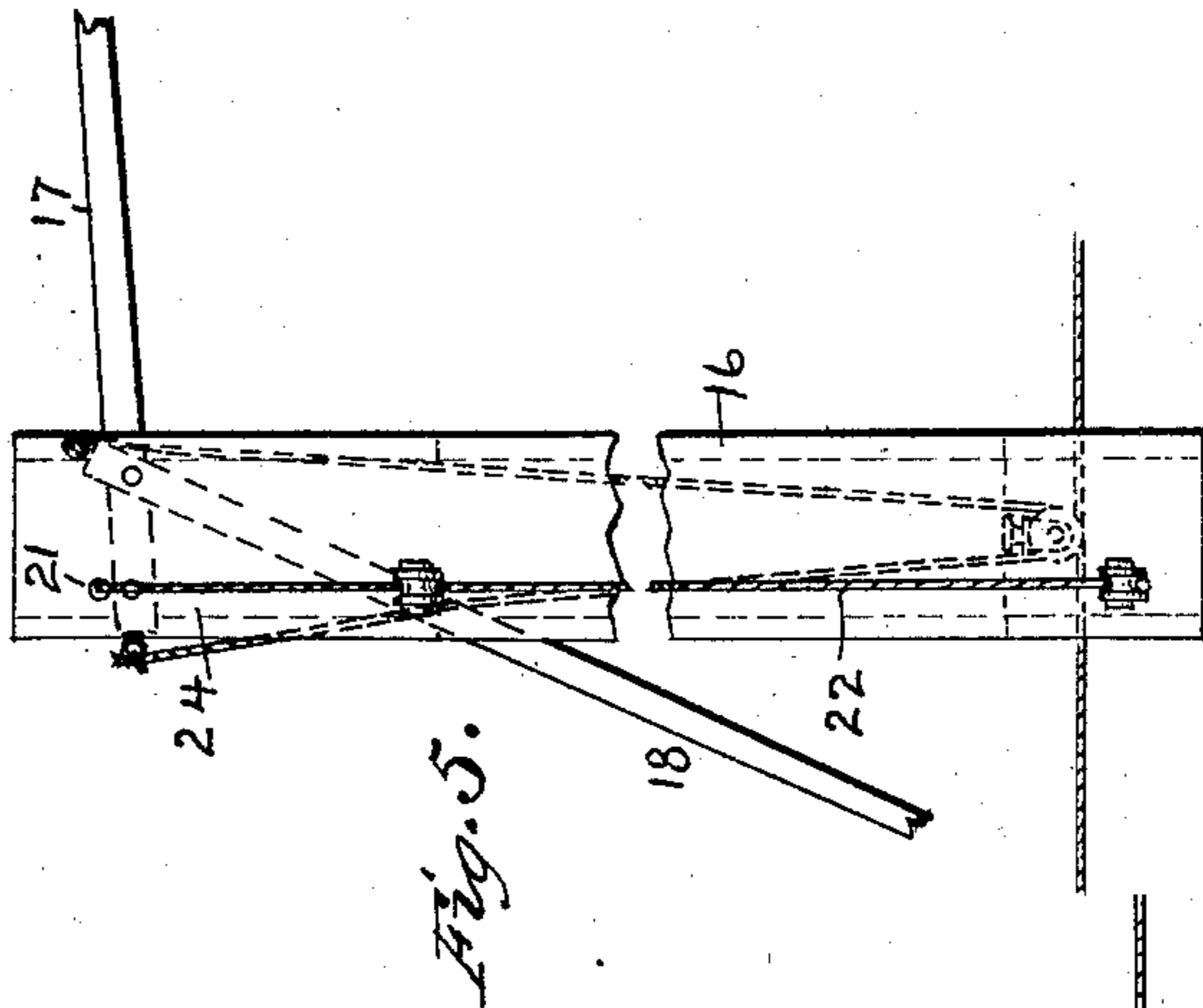
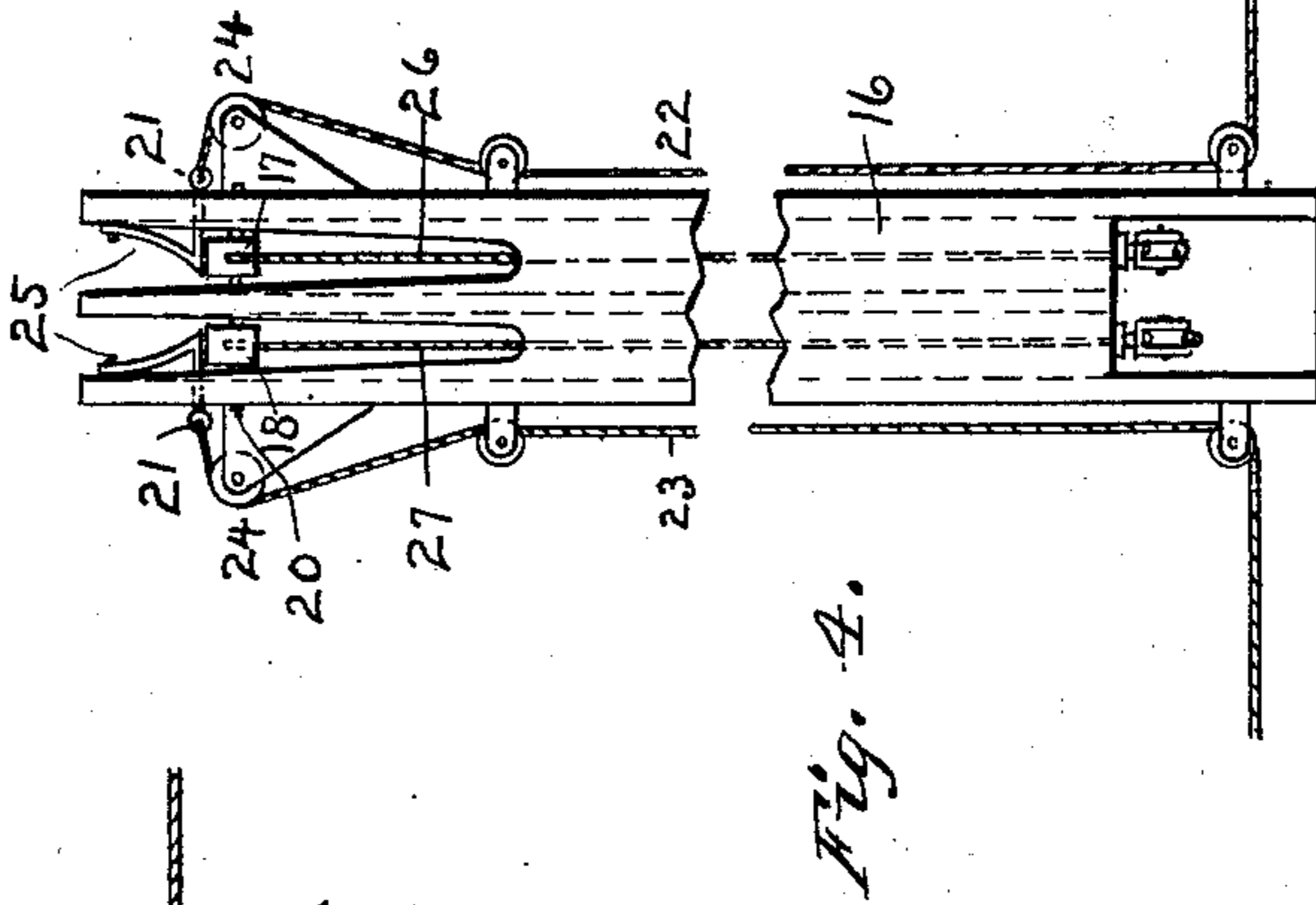
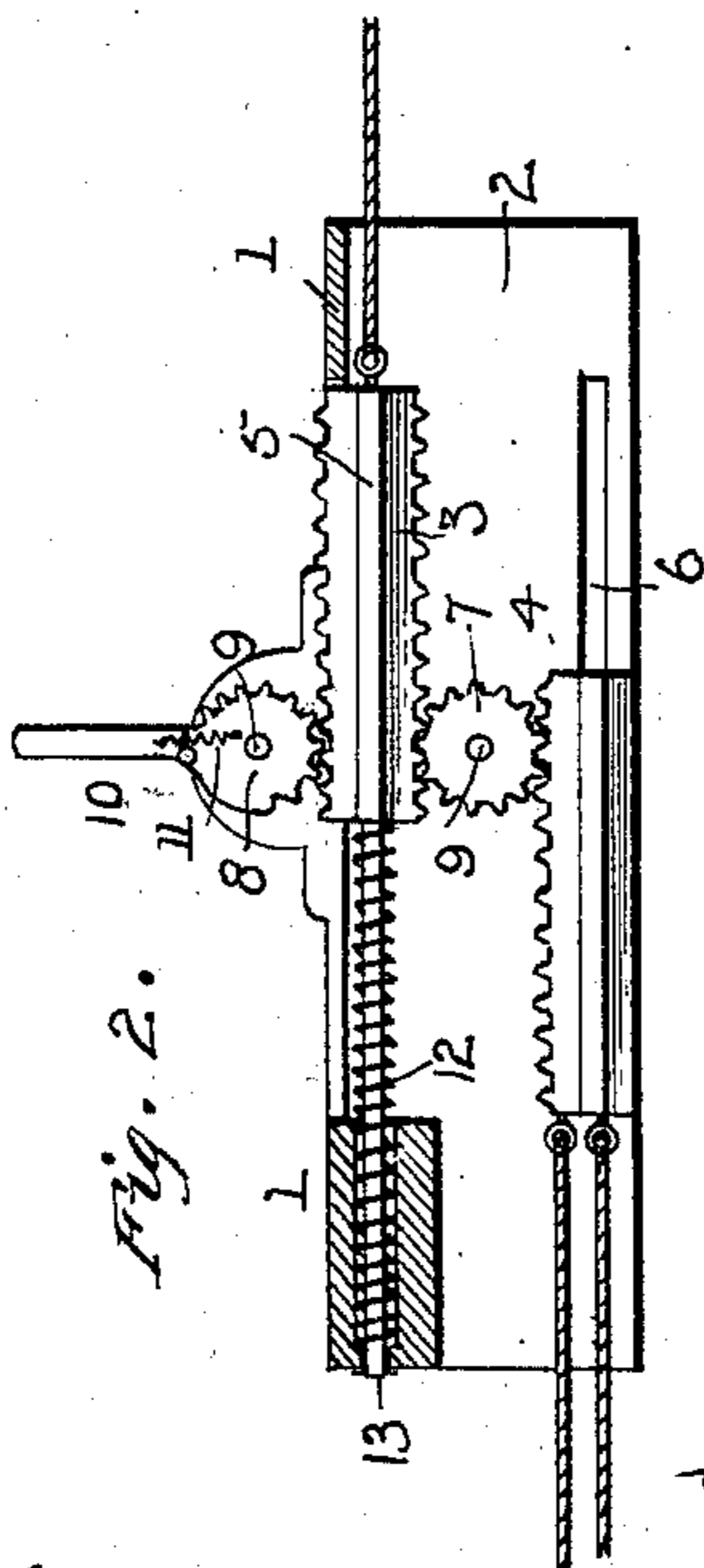
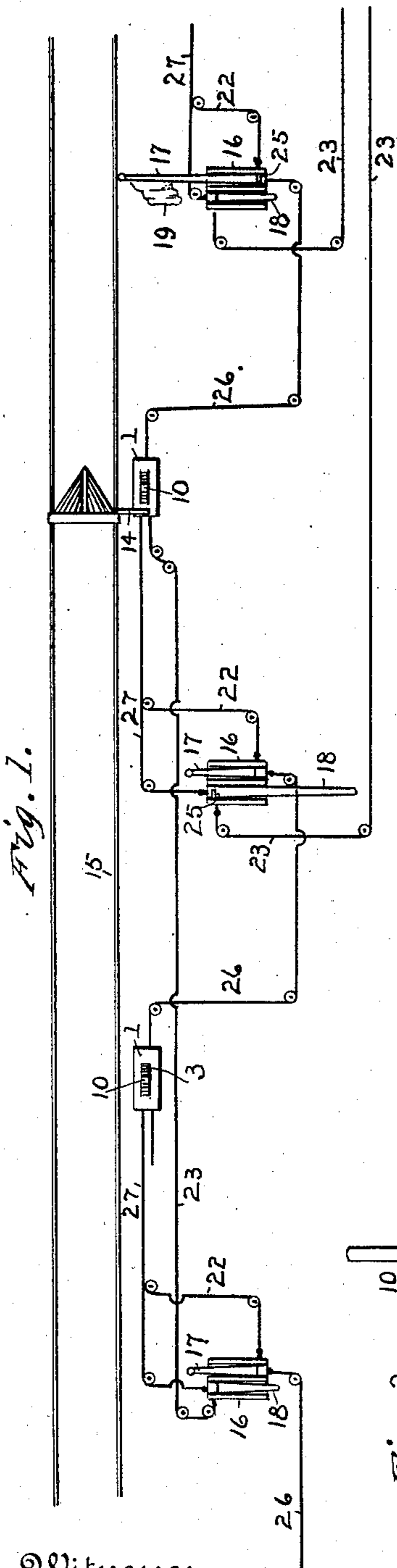
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PATENTED DEC. 8, 1903.

P. A. SAWYER.  
AUTOMATIC RAILWAY BLOCK SIGNAL.

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NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC RAILWAY BLOCK-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 746,582, dated December 8, 1903.

Application filed April 10, 1903. Serial No. 152,007. (No model.)

*To all whom it may concern:*

Be it known that I, PICKENS AUGUSTUS SAWYER, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented new and useful Improvements in Automatic Railway Block-Signals, of which the following is a specification.

This invention relates to block-signaling systems for railways; and its object is to provide a simple and efficient construction and arrangement of apparatus whereby a moving vehicle or train will automatically and successively set danger-signals at predetermined distances ahead of it and at the same time set cautionary and safety signals behind it. I accomplish this by means of a series of track instruments mechanically actuated by the train and connected by cables with the signal-posts ahead of and behind it, all as hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view of a block-signaling system embodying my invention. Fig. 2 is a longitudinal section of the track instrument, on a large scale. Fig. 3 is a cross-section of the same. Fig. 4 is a vertical section of a signal-post. Fig. 5 is a side elevation of the same.

The railway is divided into any convenient number of blocks, and in each block is placed a track instrument which comprises a body having a top 1 and upright sides or cheeks 2, between which are mounted to slide longitudinally two racks 3 4, each having lateral ribs 5 to fit into slots 6 in the cheeks. The two racks mesh with an intermediate gear-wheel 7, so as to move simultaneously. The upper rack has teeth on its upper side, with which meshes a sector-gear 8. The two gears are journaled on pins 9, passing through the cheeks 2. The sector-gear is provided with an upright lever 10, hinged to said gear and held in position by a spring 11, so that it can yield when moved in one direction, but will carry the sector-gear with it when moved in the other direction—say to the right in Fig. 2. This movement of the arm will cause the upper rack to slide to the left and the lower rack to slide to the right. The racks are kept nor-

mally in the position in which they are shown in Fig. 2 by means of a strong spring, preferably a helical spring 12, abutting between the end of the upper rack and a cross-bar 13 at the end of the body.

On the locomotive or other vehicle is a tappet 14, projecting out sufficiently far beyond the track 15 to come in contact with the lever 10 and actuate it when the locomotive is moving forward. If the locomotive is running backward, the arm will merely yield when struck by the tappet and the racks will not be actuated.

The racks are connected by suitable cables with the signaling devices, which are carried on posts 16, set at suitable distances along the road. For convenience I have shown but one post between each pair of track instruments; but it will be understood that this number may be varied to suit the requirements of any particular system.

Each signaling device comprises two pivoted arms and two spring-catches to hold them in a raised position, the arms dropping by their own weight when released. The arms are pivoted at the upper end of the post, and one of them, as 17, projects to the left and the other, as 18, to the right. The arms may carry flags 19, if desired. The post is suitably slotted to permit the movement of the arms in a vertical plane, the pivots 20 being located a short distance from the inner ends of the arms. The catches 21 stand above these short ends of the arms when the arms are raised and can be withdrawn by means of cables 22 23, running up the sides of the post and over pulleys 24 to the ends of the catches. Springs 25 are attached to the post above the catches and are integral with or attached to said catches at their inner ends, so as to form a beveled or cam surface whereby the short inner ends of the arms may press back the catches and pass by them when the arms are raised. Attached to the short end of the arm 17 is a cable 26, and a cable 27 is similarly attached to the short end of the arm 18. The cable 26 runs to the upper rack of the track instrument in the rear of the post, while the cable 27 runs to the lower rack of the instrument in front of the post. The cable 22 for actuating the catch for the arm 17

is a branch of the cable 27, and the cable 23 for actuating the catch for the arm 18 runs to the second instrument ahead of the post.

The operation of my invention is as follows:

5 When the tappet 14 strikes a lever 10 and rocks the sector-gear, the upper rack slides to the left (or backward with reference to the train) and pulls the cable 26, thus raising the arm 17 on the post ahead of the train,  
10 where it is caught and held by the catch 21.

At the same time the lower rack slides forward (to the right) and pulls both cables 23 and 27. Cable 27 raises the arm 18 on the post immediately behind the track instrument, and at the same time its branch 22 trips the catch for the arm 17 on that post and lets it drop. Cable 23 simultaneously trips the catch for the arm 18 on the second post in the rear and lets that drop. Thus as  
15 the train passes each track instrument it sets a danger-signal 17 on the post in front and sets a cautionary signal 18 and drops the danger-signal on the first post in the rear and drops the cautionary signal on the second  
20 post in the rear.

Having thus described my invention, what I claim is—

1. In a block-signaling system, the combination with a plurality of track instruments,  
30 of a plurality of block-signal posts, each carrying two signaling-arms one for danger and the other for caution, a cable connecting each track instrument with the danger-arm in the block in front of it, a cable connecting said  
35 instrument with the cautionary arm in the block behind it, both of said cables operating to set said signal-arms and cable connections for tripping the danger-arms and cautionary arms in blocks behind said instrument.

40 2. In a block-signaling system, the combination with a plurality of track instruments, of a plurality of block-signal posts, signal-arms on said posts, catches for holding said arms raised, and cables connected with each  
45 track instrument for simultaneously setting the danger-arm in the block in front of said instrument, tripping the danger-signal in the block behind said instrument, and setting the cautionary signal in said block, and tripping  
50 the cautionary signal in the second block behind said instrument.

3. In a block-signaling system, the combination with a plurality of track instruments, of a plurality of block-signal posts, signal-

arms on said posts, catches for holding said 55 arms raised, a cable running from each track instrument to the danger-arm in the block in front, a second cable running from said instrument to the cautionary arm in the block behind, a branch cable from said second ca- 60 ble to the catch for the danger-arm in the block behind, and a third cable running from said instrument to the catch for the cautionary arm in the second block behind.

4. In a block-signaling system, a track in- 65 strument comprising two longitudinally-sliding racks, an intermediate gear, a sector-gear meshing with teeth on the upper rack, and a lever-arm hinged to said sector-gear.

5. In a block-signaling system, a track in- 70 strument comprising a body having longitudinal slots in its sides, two racks having ribs fitted to slide in said slots, an intermediate gear meshing with said racks, and means for actuating the upper rack. 75

6. In a block-signaling system, a track in- strument comprising a body, two racks fitted to slide longitudinally therein, an intermedi- ate gear meshing with said racks, a sector- gear meshing with teeth on the upper side of 80 the upper rack, a lever hinged to said sector-gear, a spring attached to said arm and gear, and a spring between one of said racks and the end of said body.

7. In a block-signaling system, a signal- 85 post having an arm pivoted thereto, a spring-catch for retaining said arm in a raised position, a cable attached to said arm, and a cable attached to said catch.

8. In a block-signaling system, a signal- 90 post having two arms pivoted thereto, spring-catches for holding said arms raised, and a cable for simultaneously raising one arm and tripping the catch of the other arm.

9. In a block-signaling system, a signal- 95 post having two arms pivoted thereto, a spring-catch for each arm, a cable for raising each arm, a branch cable from one of said cables to the catch for the other arm, and a cable for the catch for the first arm. 100

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PICKENS AUGUSTUS SAWYER.

Witnesses:

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D. F. LIPFORD.