

No. 753,853.

PATENTED MAR. 8, 1904.

F. B. DE CHAVANNES.
RAILWAY SIGNALING.

APPLICATION FILED SEPT. 3, 1903.

NO MODEL.

6 SHEETS—SHEET 1.

Fig. 1.

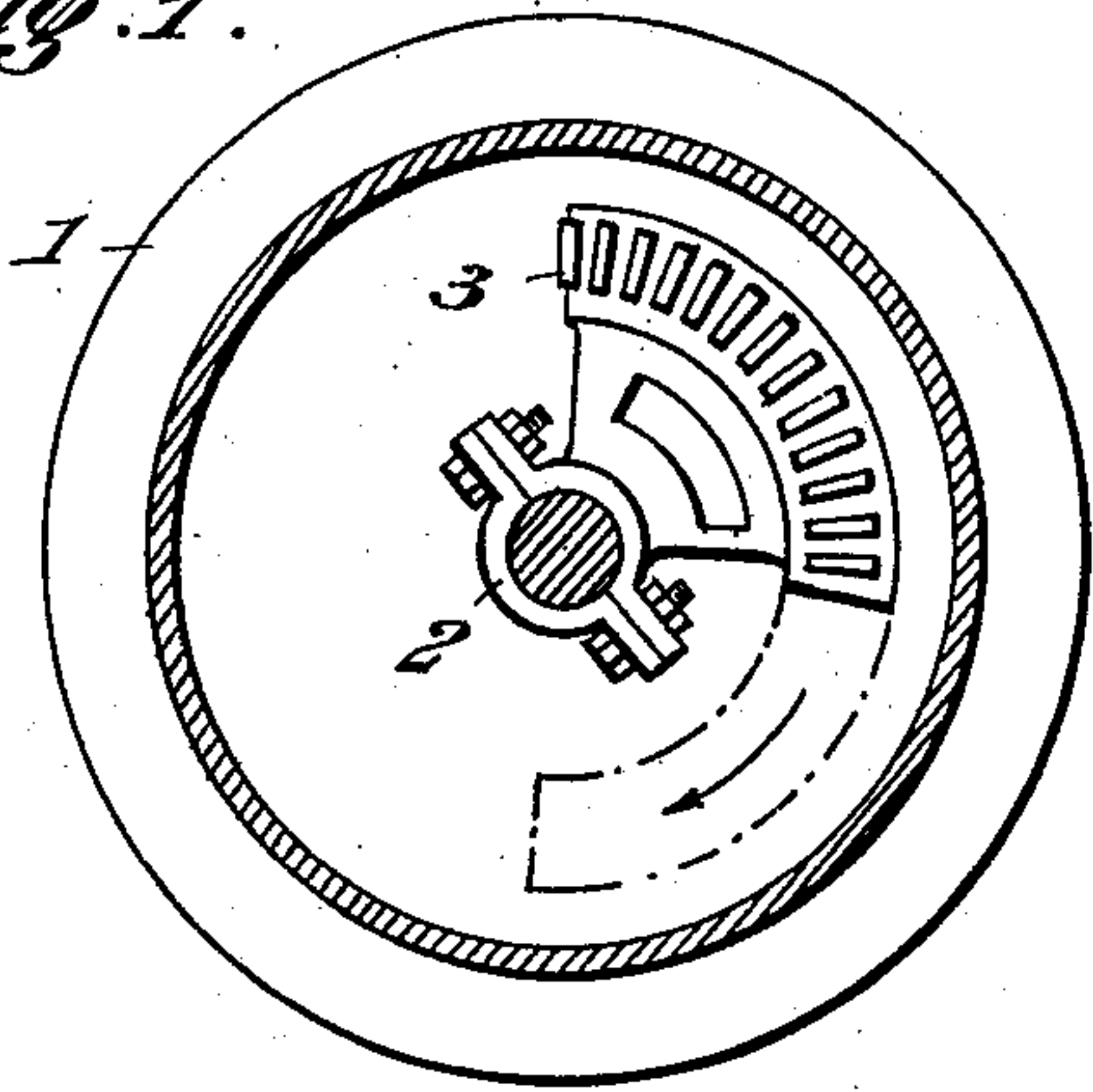


Fig. 3.

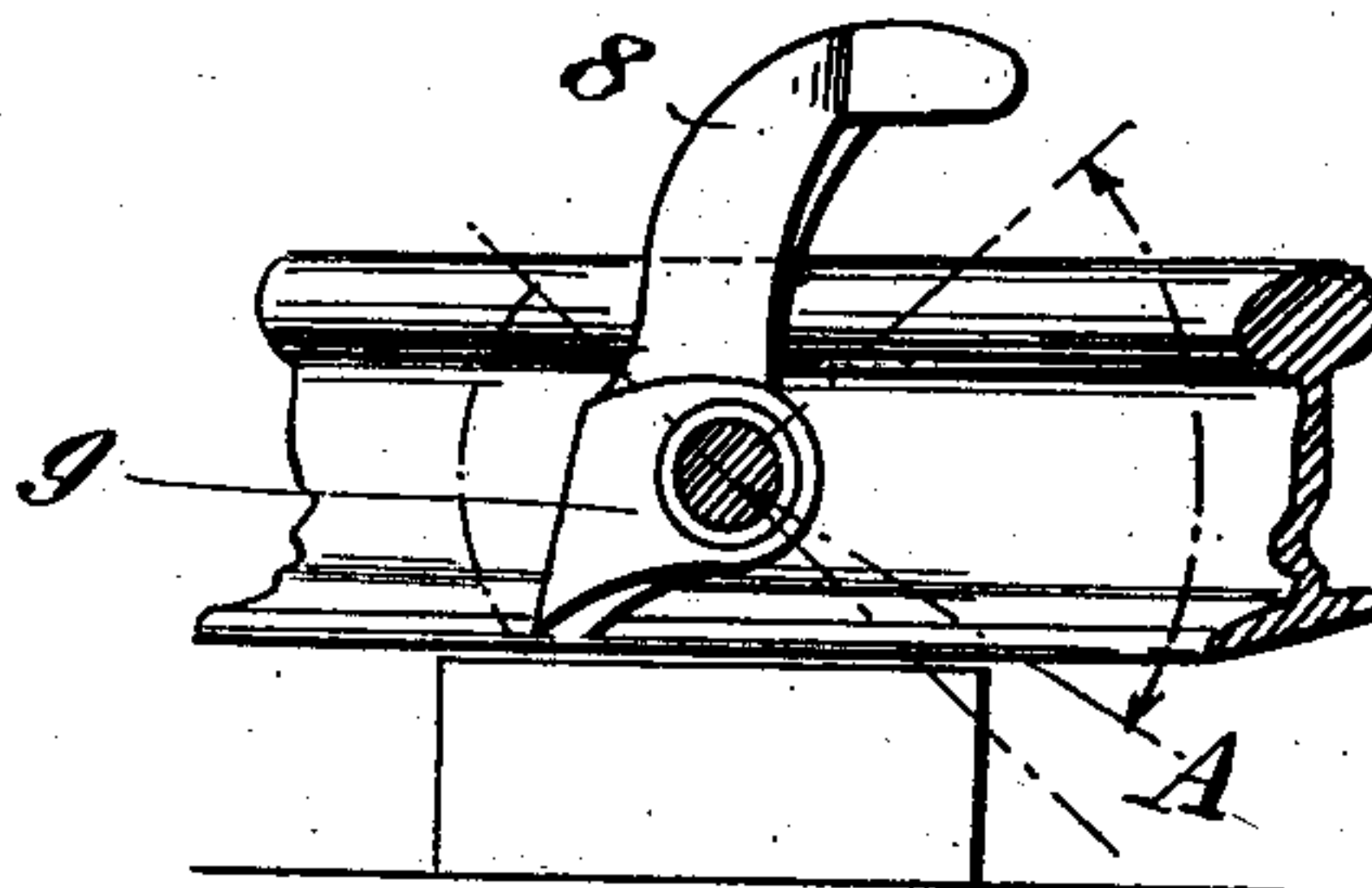


Fig. 4.

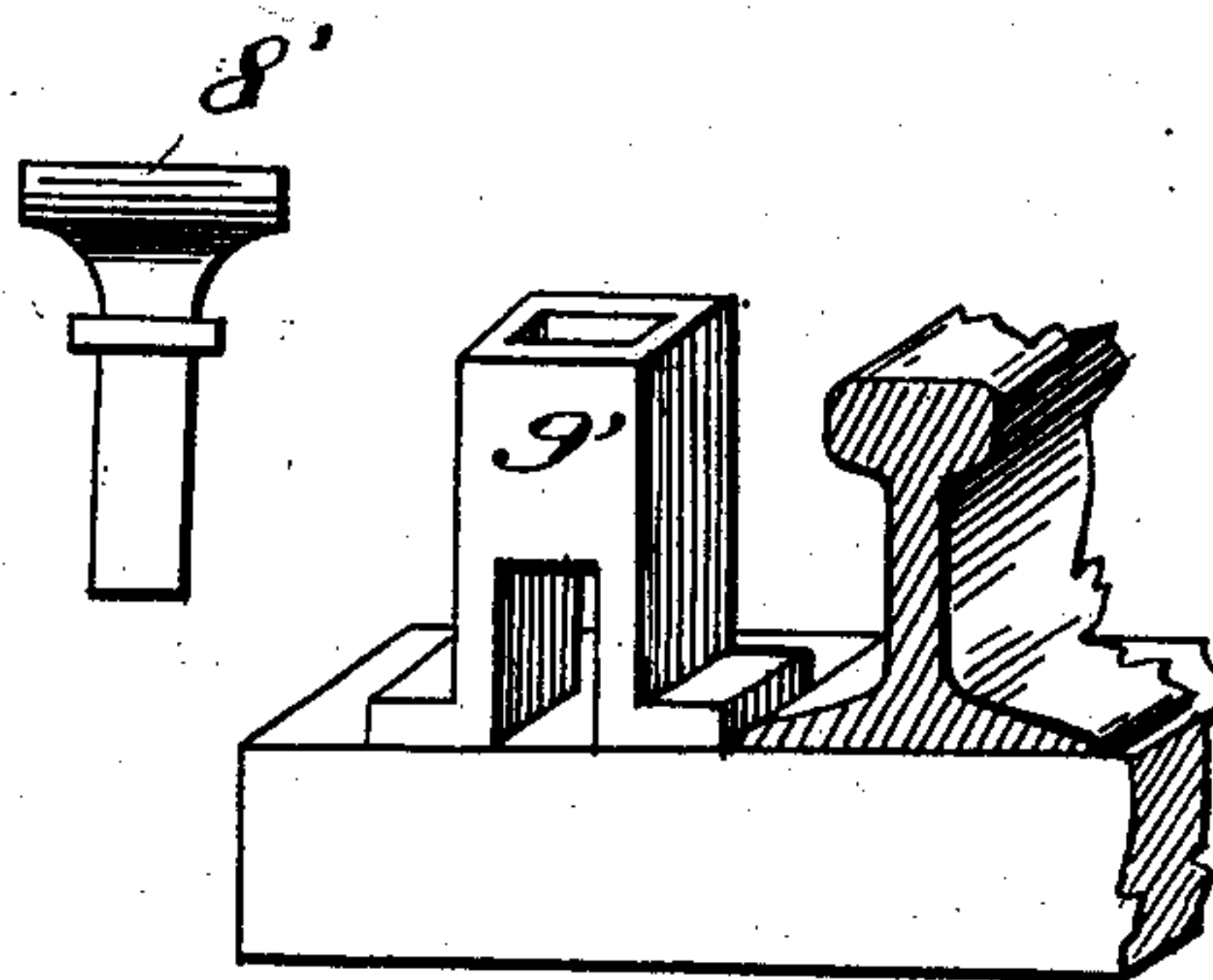
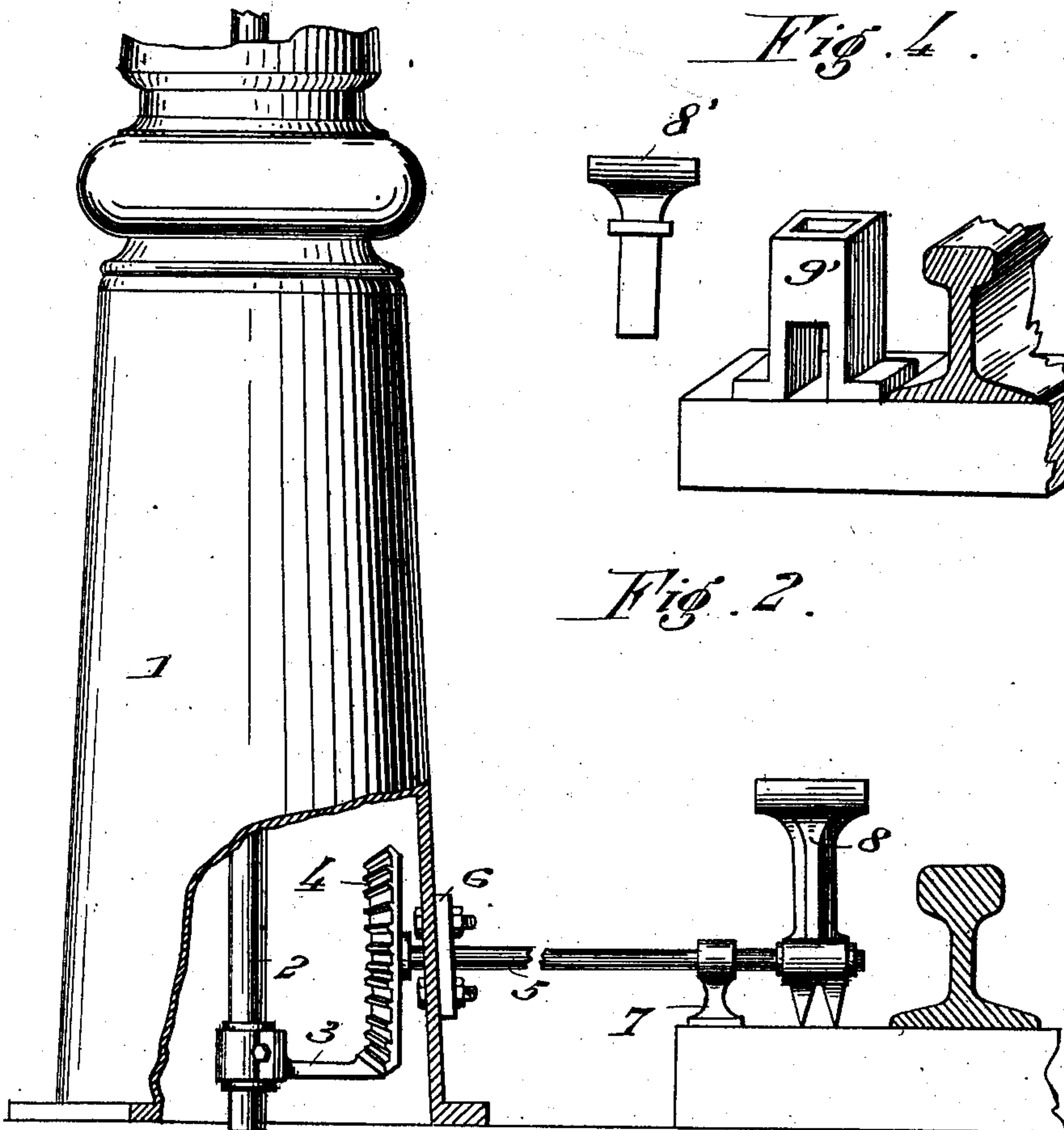


Fig. 2.



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6 SHEETS—SHEET 2.

Fig. 6.

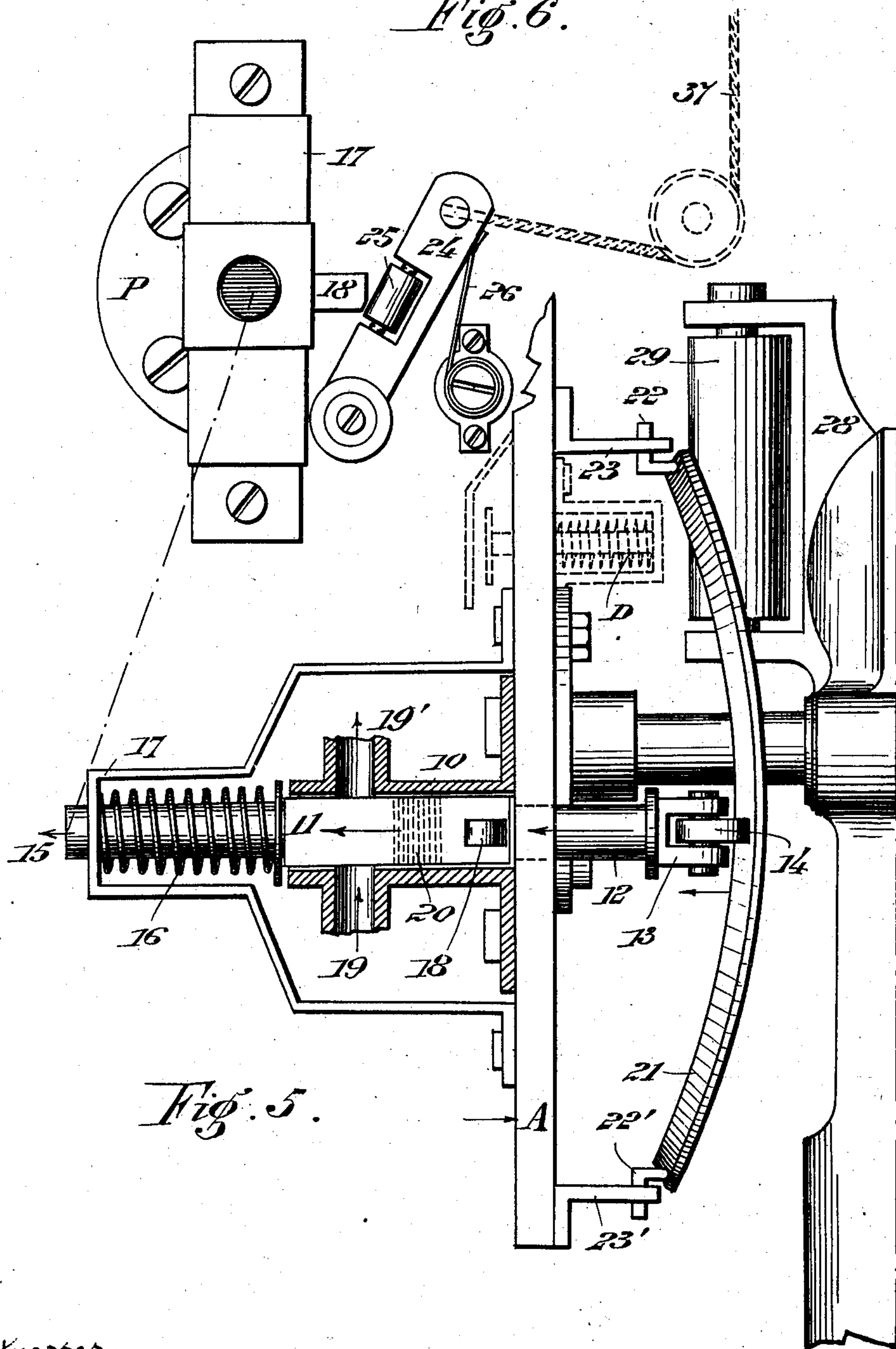


Fig. 5.

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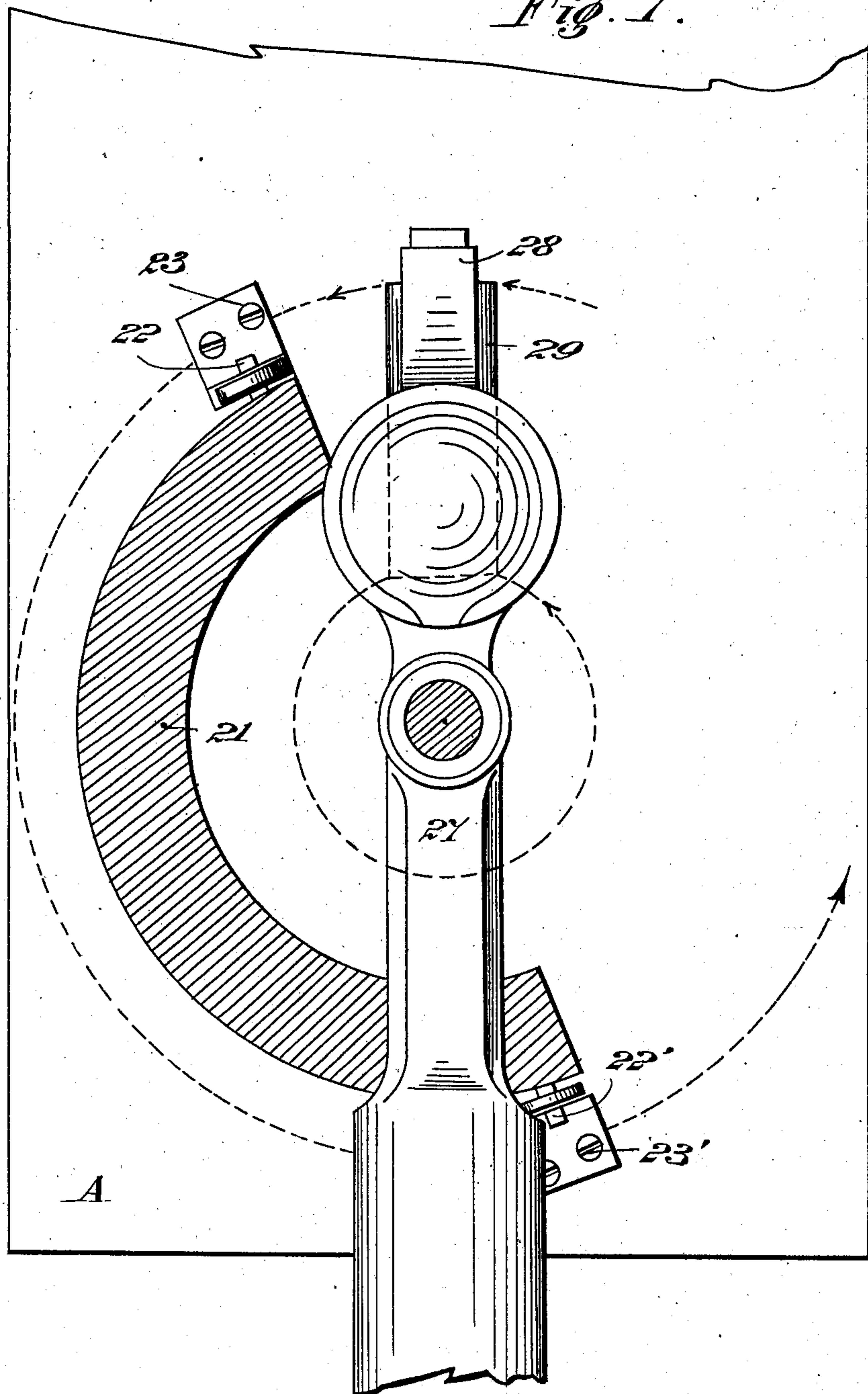
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6 SHEETS—SHEET 3.

Fig. 2.



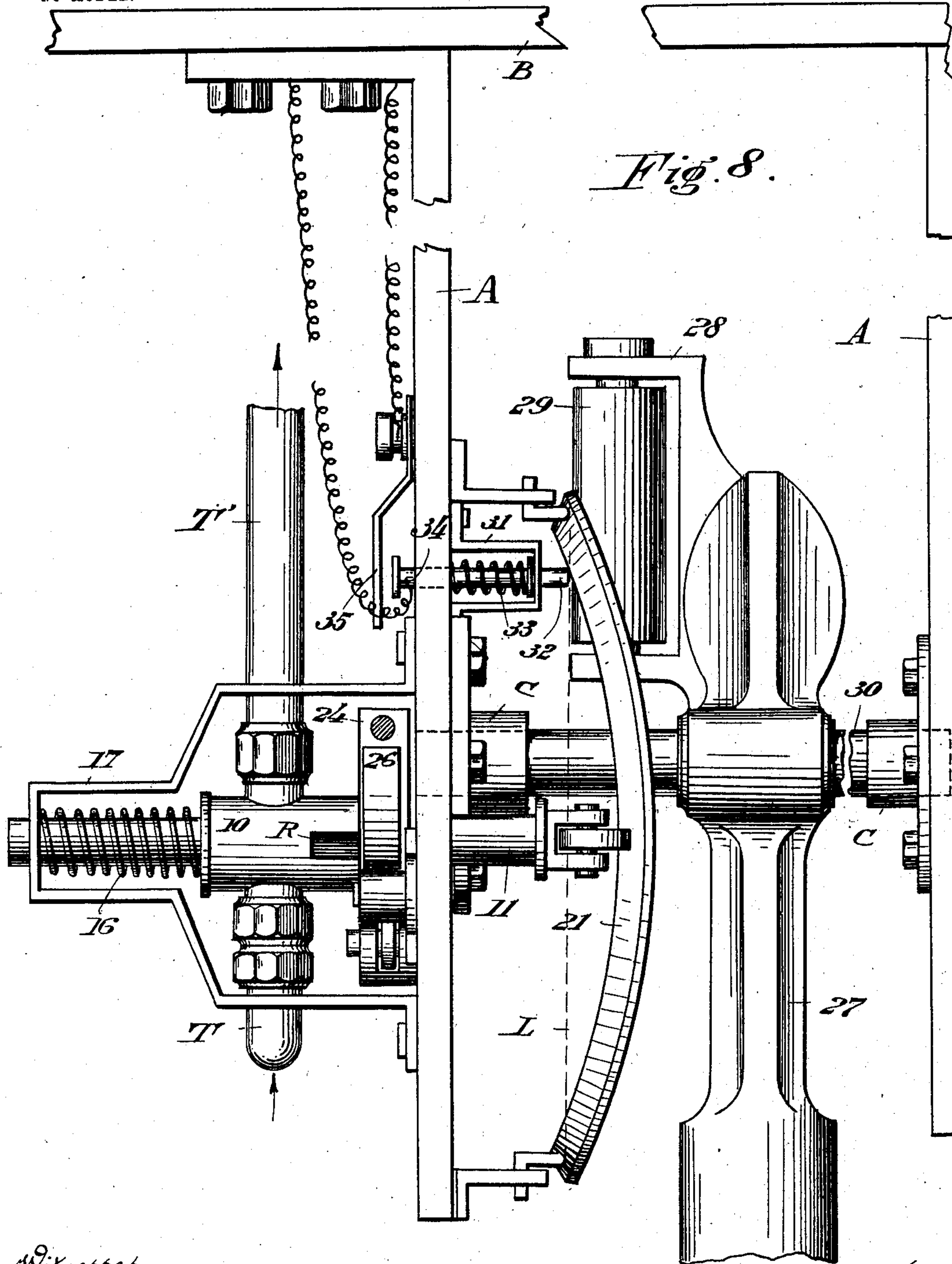
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6 SHEETS—SHEET 4.



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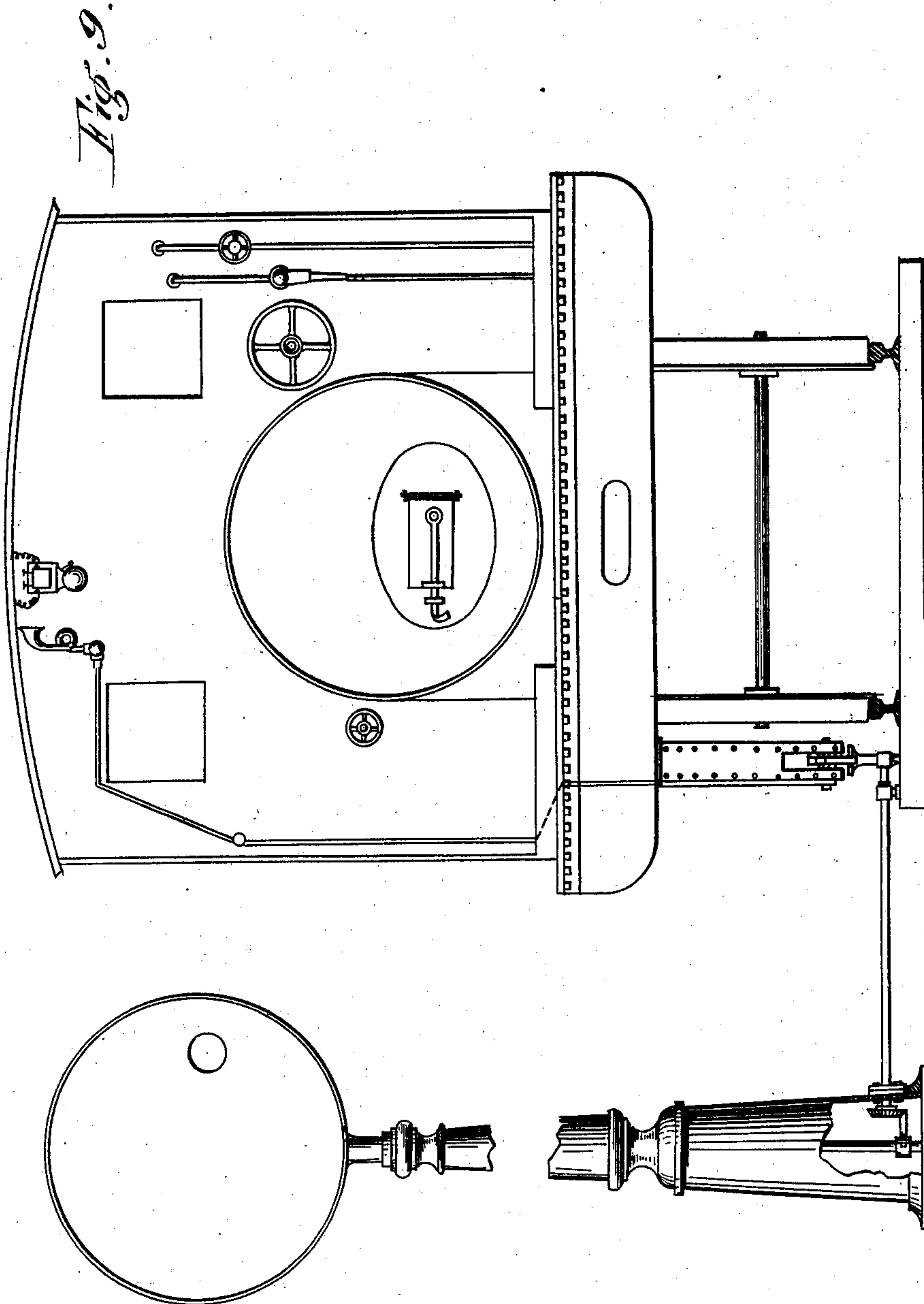
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6 SHEETS—SHEET 5.



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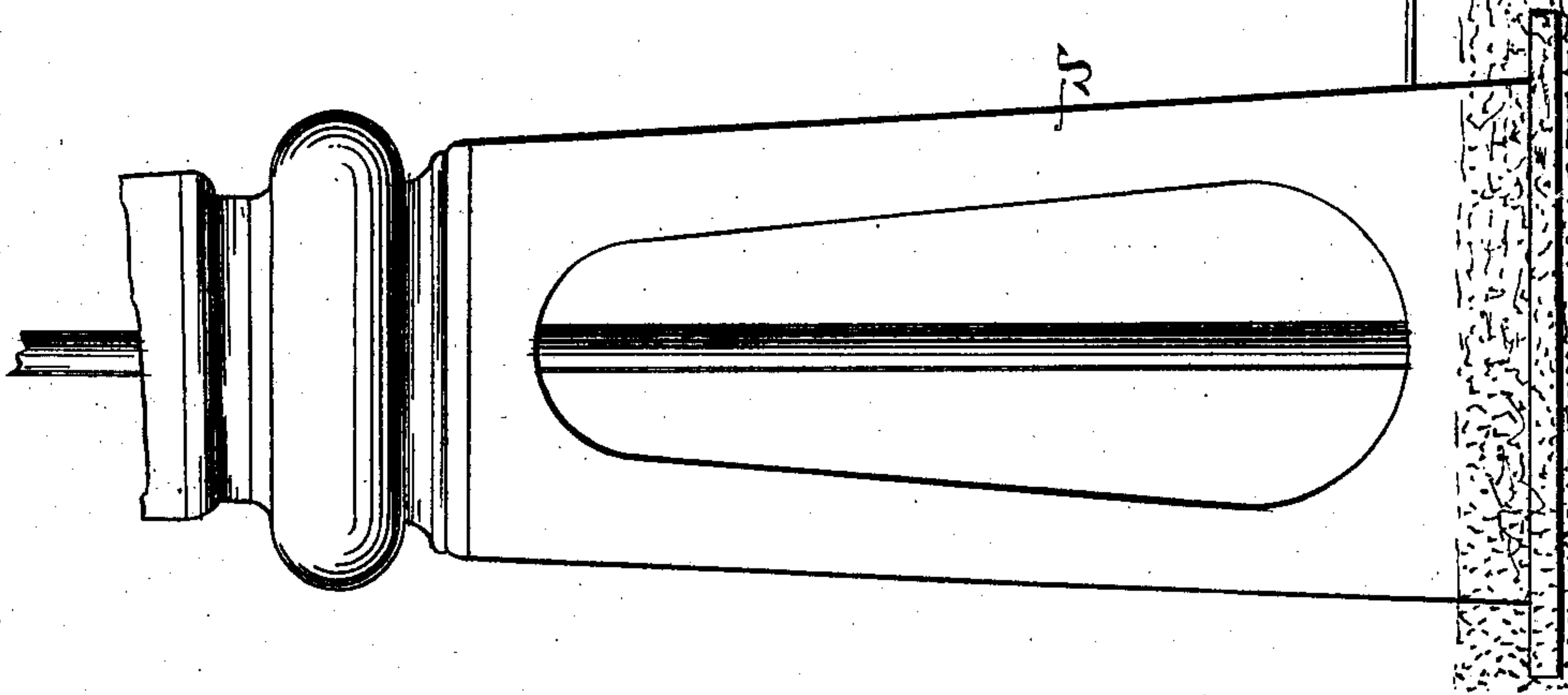
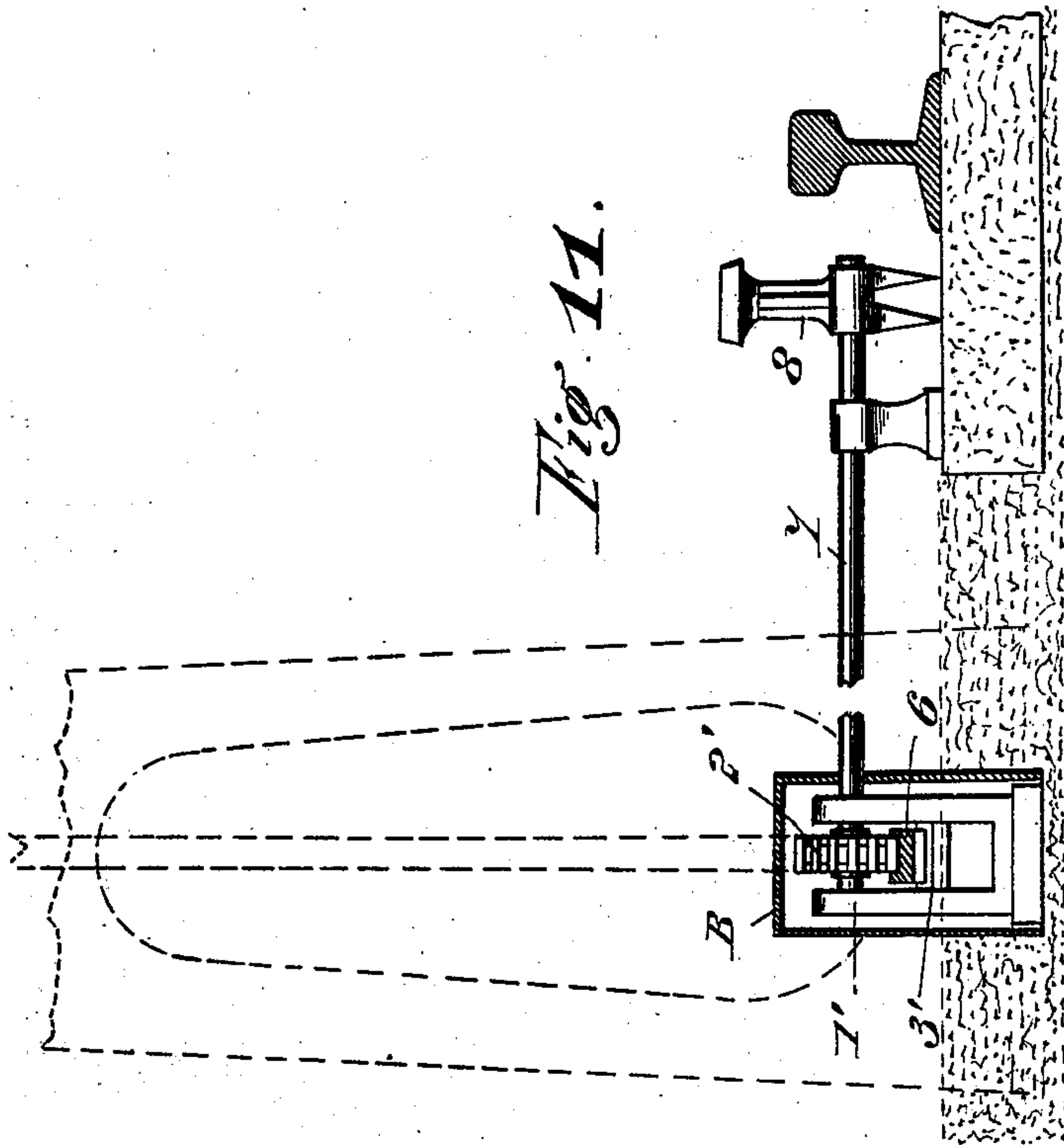
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NO MODEL.

6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

FERDINAND BERNE DE CHAVANNES, OF MARSEILLES, FRANCE.

RAILWAY SIGNALING.

SPECIFICATION forming part of Letters Patent No. 753,853, dated March 8, 1904.

Application filed September 3, 1903. Serial No. 171,802. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND BERNE DE CHAVANNES, a citizen of the French Republic, and a resident of Marseilles, France, have invented certain new and useful Improvements in Railway Signaling, of which the following is a specification.

This invention relates to automatically-operated means for actuating warning-signals and in certain circumstances also applying the brakes on a railway-train in motion either when passing an ordinary semaphore or like signal at "danger" or at any predetermined point, said means being partly located on or alongside the track and partly on the engine or train. The part located on the track is adapted to cooperate with that on the engine or train. It may be portable and is preferably adapted to be coupled to an ordinary semaphore or like signal, so that the "drawing" of the signal places such part in its inoperative position.

In the hitherto-known devices for preventing railway collisions two difficulties which prevented their application have always been encountered—viz., their lack of simplicity, which often renders them inefficient, and the very considerable cost of installing them. This invention obviates these defects, its application is very simple, its operation certain, and it does not present the inconveniences inherent to the use of warning-signals which are actuated by electric apparatus. It costs comparatively little, it is easily fitted in position, and it does not necessitate alteration or modification in any way of the signals at present in use.

According to my invention the driver of a train in motion is warned by audible signals, such as a siren or an electric bell, that the section of line he has entered is not clear, and, if desired, the guard also can be simultaneously warned in a like manner.

The ordinary railway-signals impose a constant strain upon the driver, and a momentary forgetfulness or distraction may have most serious consequences. Again, heavy rain, falling snow, or a fog may prevent the driver seeing a signal, and at night a signal-lamp may be out. All these causes increase the risk of

accidents occurring; but with my system of signals, no matter what the state of the atmosphere may be, the driver will always be effectively warned in entering upon a blocked section.

My invention comprises a device operated by the semaphore-operating rod, so as to automatically raise a stop, which latter in turn causes a rod or lever mounted on the locomotive and controlling the warning-signals to be operated where the train is passing.

This invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional plan view of a semaphore-post used in this system. Fig. 2 is an elevation of the same, partly in section. Fig. 3 is a view showing a pivoted stop. Fig. 4 is a view showing a modified form of stop. Fig. 5 is a detailed view, partly in section, showing the signal-operating mechanism. Fig. 6 is an end view showing a portion of the same. Fig. 7 is a view from the opposite side, showing the swinging lever 27 and connected parts. Fig. 8 is a view showing the signaling mechanism in connected and operative position. Fig. 9 is a diagrammatical view showing the signaling apparatus. Fig. 10 is a view showing modified form of stop-operating mechanism. Fig. 11 is another view of the same.

Fig. 1 is a sectional plan view of the base of a semaphore-signal post 1 with its disk-shaft 2. On this shaft I fix a toothed sector 3, which gears with a bevel-pinion 4, Fig. 2.

Fig. 2 represents in elevation a portion of the semaphore-signal post 1 with the usual disk-shaft 2, the toothed sector 3, and the pinion 4, gearing with the latter. This pinion is keyed upon a shaft 5, which is supported at one end in bearings in a bracket or plate 6, fixed to the signal-post, its other end being carried by a bracket or support 7, fixed to one of the sleepers opposite the semaphore. Upon this end of the shaft a contact part or stop 8 is fixed, Figs. 2 and 3, the arrangement being such that the rotation of the shaft 2 on the signal being operated will either raise or lower the stop 8, accordingly as the signal indicates line blocked or line clear.

Fig. 3 shows a side view of the stop in its raised position, its depressed or lowered position.

sition being indicated by a dot-and-dash line at A. This stop is furnished at its lower end with two spurs 9, which limit its upward movement.

5 Fig. 4 shows a removable or portable stop 8' and its holder 9'. The use of these parts will be hereinafter set forth.

Figs. 10 and 11 show in side and end elevation, respectively, alternative means for operating the stop 8. These means consist of a support 1', carrying a toothed wheel 2', keyed on a shaft, a roller 3', a second support 4', provided with a roller 5', and a toothed rack 6', slidably supported by the rollers 3' 5' and 15 gearing with the wheel 2'. An eye or ring is formed at each end of the rack, to which are connected the ends of the wire F, which latter when pulled by the signalman in the direction indicated by the arrow causes the 20 disk-shaft of the signal to rotate. B is a box containing the working parts, which may be partly sunk in the ground.

Fig. 5 is an elevation, partly in section, of means for operating an audible signal, said 25 means being carried by a frame A, (see also Fig. 8,) fixed upon the locomotive. 10 is a tubular support or bracket in which a spindle 11 fits snugly and is adapted to slide. Said spindle has its end parts 12 and 15 turned 30 down to a smaller diameter, and the end of the part 12 is provided with a pair of cheeks 13, in which a tongue 14 is pivoted, which tongue is fixed to the axis of a semicircular part 21, and said tubular support 10 is formed 35 with lateral branches 19 19' in alinement with each other and normally closed by the spindle 11. The portion of this spindle 11 which slides in the tube 10 is square, and in it an aperture 20, hereinafter referred to, is formed. The 40 other end 15 of same, which is round, passes through a coiled spring 16 and thence into a hole in a suitable bracket-support 17, fixed to the upright A of the frame. 18 is a stop fixed on the spindle 11. The arrangement of the 45 parts numbered 10 to 20 forms, as will be clearly seen in Fig. 5, a kind of tap. When the spindle 11 is pushed back, the aperture 20 is brought into alinement with the branches 19 19' and allows steam or compressed air to pass 50 therethrough to operate the siren placed in the driver's cab. The ends of the part or segment 21 are furnished with pivots 22 22', which are carried in lugs or bearings 23 23'. In the drawings I have indicated in dotted 55 lines a contact D for an electric bell. It is shown in Fig. 8.

Fig. 6 shows a front view of the support 17, the end 15 of the spindle 11 being shown in section. The flange P of the tubular support 60 11 is fixed to one side of the frame A. 24 is a pawl provided with a friction-roller 25 and a spring 26. The pawl engages the stop 18 on the spindle 11 at the instant the latter is forced back by the segment 21, which is caused

to oscillate in a vertical plane by a roller 29, 65 hereinafter referred to.

Fig. 7 is a side elevation of the lever 27, which controls the warning-signals and which is operated by coming in contact with a stop 8. Said lever is provided at its upper part with a 70 bracket 28, in which a spindle carrying the roller 29 is mounted. This segment and the manner in which it is mounted are shown in Figs. 5 and 6. The actuation of the lever 27 in either direction causes it to rotate and in 75 rotating it causes the roller 29 to force said segment, which is situated in the path of movement of said roller, and with it the spindle 11, back against the action of the spring 16, thus bringing the aperture 20 in alinement 80 with the tubes 19 19' and operating the warning-signal. The pawl may be disengaged from the stop 18 to allow the parts to resume their normal positions by the driver pulling on a cord 37. (Indicated in dotted lines in 85 Fig. 6.)

Referring to Fig. 8, T is the inlet-pipe (a continuation of the tube 19) for the steam or compressed air. T' is the corresponding outlet-pipe (a continuation of the tube 19') to the 90 siren placed in the engine-cab. R is a groove formed in the body of the support 11. The catch 18 of the spindle 11 slides in said groove. The dotted line indicates the vertical position of the segment 21 after it has been operated 95 and has in turn pushed back the spindle 11. The lever 27 is keyed upon a shaft 30, which is carried in bearings C, fixed to the frame A. If an electric bell be employed to give the warning-signal, I slidably mount a spindle 32, 100 provided with a fixed collar, in bearings in the bracket 31 and the frame A about as shown in Fig. 8. The inner end head of this spindle is engaged by the segment 21 when the latter is pushed back by the roller 29, and 105 said spindle is thereby pushed outward against the action of the coiled spring 33, thus causing the outer end 34 of the spindle, to which an electric wire is connected, to make contact with a flat brass spring 35, fixed upon the 110 frame A by means of an adjusting-screw 36, to which is connected the second electric wire, establishing the necessary circuit for ringing the bell.

Fig. 9 shows diagrammatically my inven- 115 tion applied to a locomotive and also the track-stop in its raised position and geared to an ordinary signal at "danger."

If my invention be applied to an engine or train provided with a pneumatically-operated 120 brake, the sounding of the siren, brought about as described, will, if the air necessary for the purpose be taken from the brake-reservoir, automatically cause the brake or brakes to be applied the moment the siren is sounded. 125

The holder 9' and its removable stop 8' (illustrated in Fig. 4) are intended to be used in circumstances when it is necessary to stop a train

and there is no opportunity to communicate with a signalman or when the latter cannot by the means at his disposal stop such train.

5 Holders, such as 9', are fixed at any desired parts of the track—say at a distance from stations—so that by the mere insertion of a stop 8' the driver of an approaching train will be warned in the manner described. This, it will be understood, constitutes also an effective
10 substitute for the detonating-signals now in use.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

15 1. In a system of railway-signals of the character herein set forth, the combination with the semaphore-operating mechanism, of a stop, means for operating said stop from said semaphore, a rotatable lever mounted on
20 a locomotive, and adapted to be engaged by said stop when the latter is in raised position, a segment adapted to be operated by said lever, a valve operated by said segment, and a signal adapted to be operated when said valve
25 is opened, substantially as described.

2. In a railway signal system, the combination of a semaphore-rod, a toothed sector on said rod, a beveled wheel engaging with said sector, a shaft operated by said beveled wheel,

a contact-stop on said shaft, a rotatable lever 30 mounted on a locomotive and adapted to engage with said stop, and a signal adapted to be operated by said lever.

3. In a railway signal system, the combination of a rotatable lever mounted on a locomotive, a roller on said lever, a segment yield- 35 ingly mounted adjacent to said roller, and adapted to be operated thereby when the lever is turned, a valve having a valve-stem connected with said segment, whereby the valve 40 is opened when the segment is depressed, means for automatically locking said valve in opened position, an inlet-pipe leading from said valve to a source of fluid-supply, and an outlet-pipe from said valve leading to a suit- 45 able signal, substantially as described.

4. In a railway-signal, the combination of a contact-stop, a lever pivoted on a locomotive and adapted to be operated by said contact- 50 stop, a roller on said lever, a segment yieldingly mounted adjacent to said roller, and a signal adapted to be operated by said segment when the latter is depressed by said roller, substantially as described.

FERDINAND BERNE DE CHAVANNES.

In presence of—

E. J. WILLIAMS,

G. PHELAN.