

No. 714,595.

Patented Nov. 25, 1902.

M. D. MOORE.  
RAILWAY SIGNALING APPARATUS.

(Application filed May 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

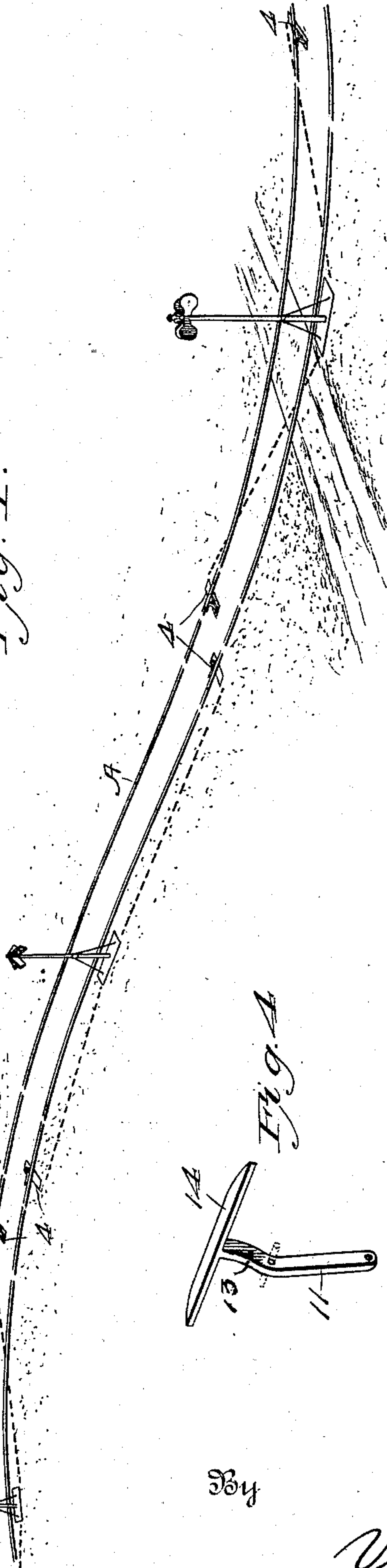


Fig. 3.

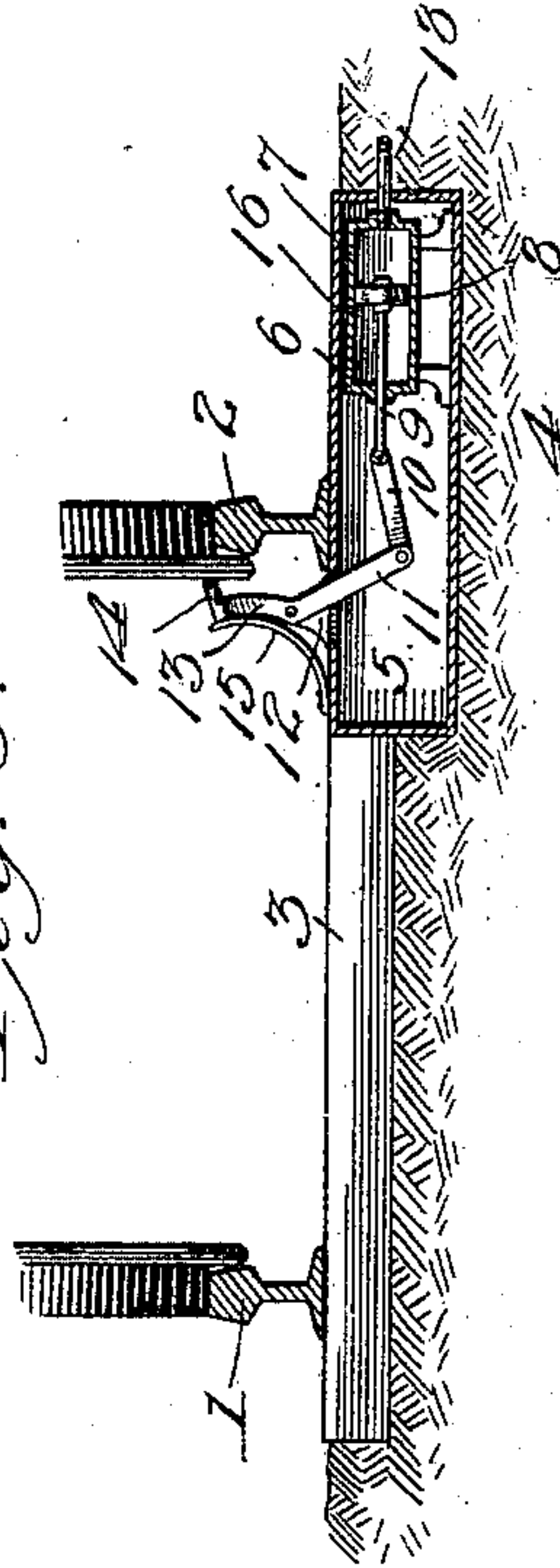
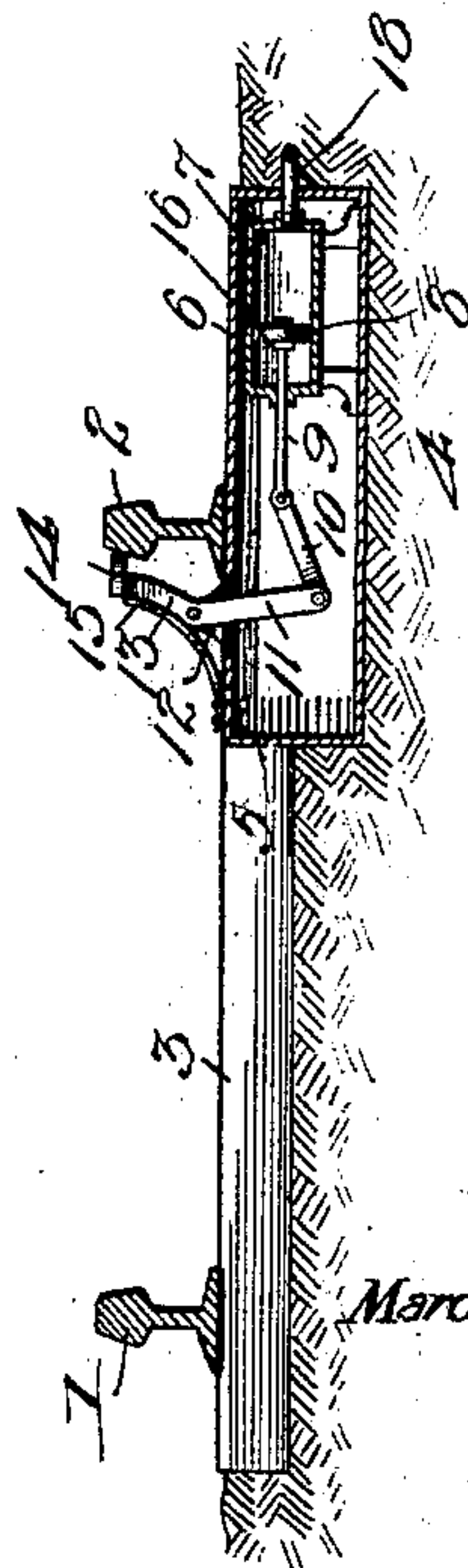


Fig. 2.



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2 Sheets—Sheet 2.

Fig. 6.

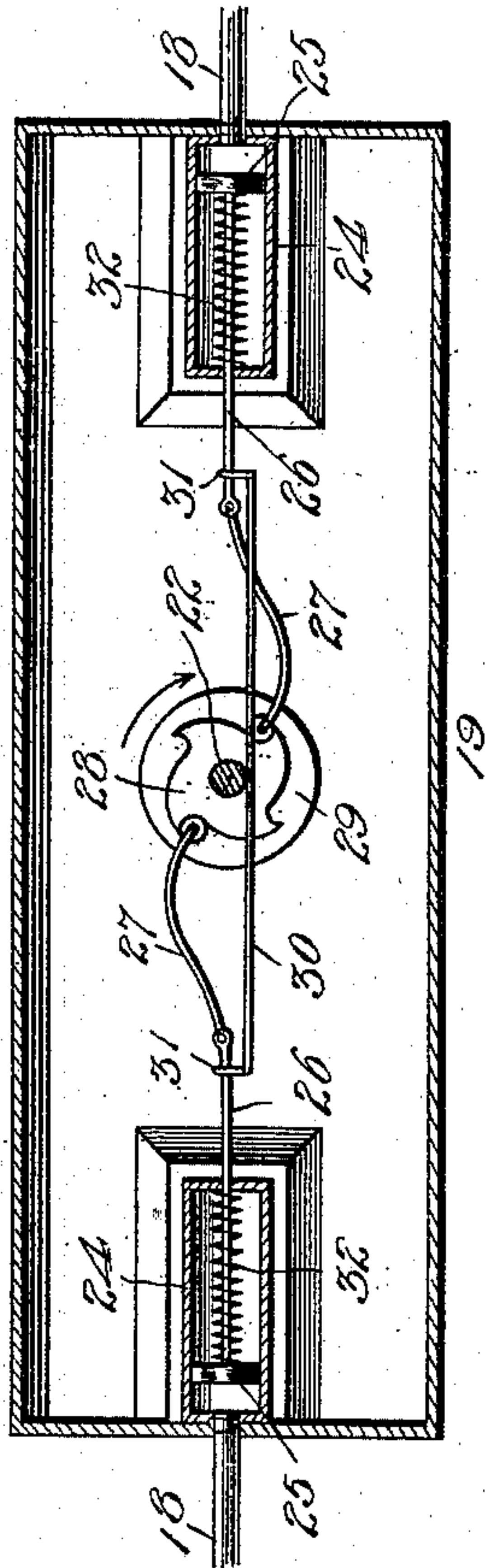


Fig. 7.

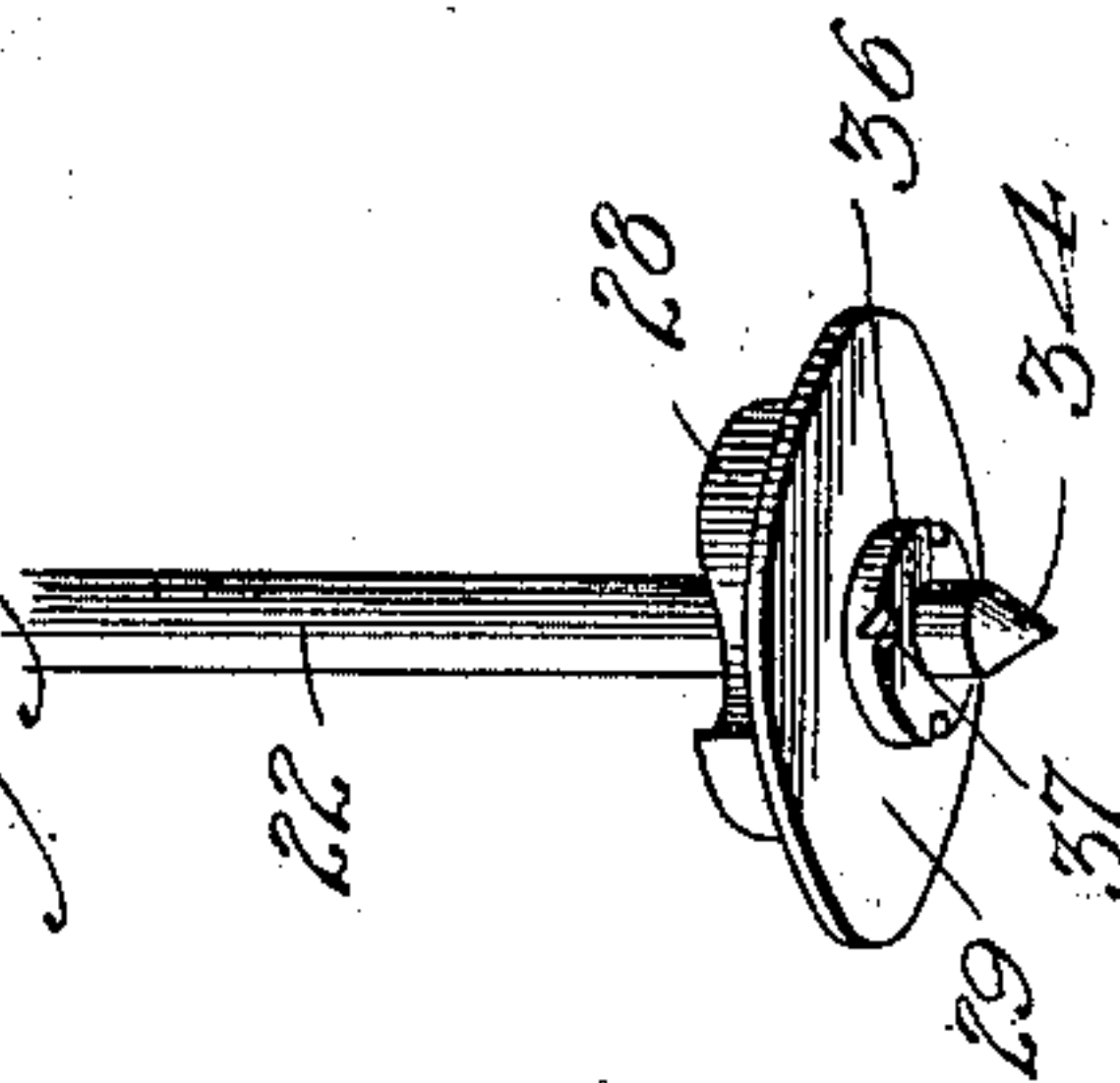
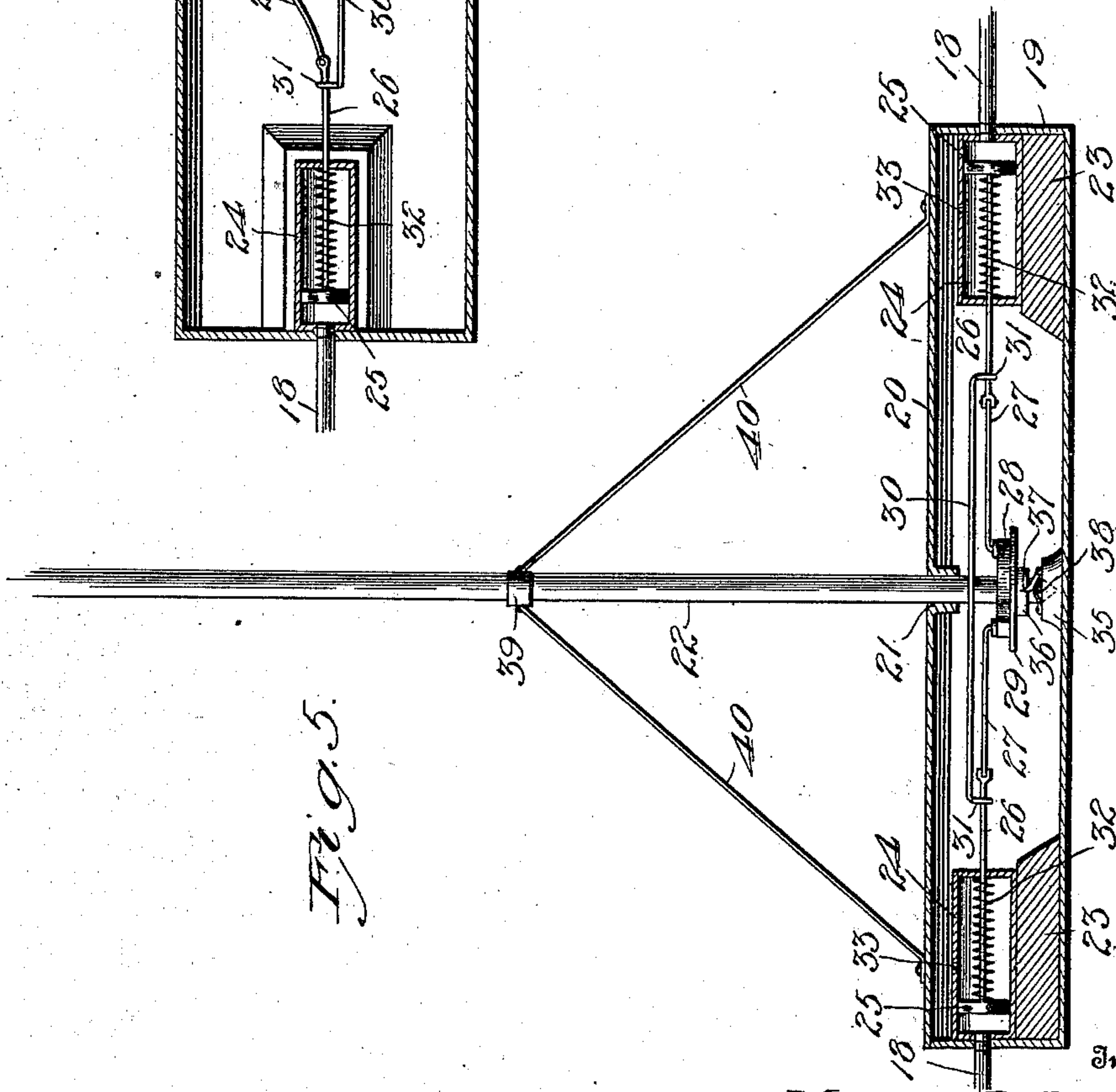


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 714,595, dated November 25, 1902.

Application filed May 2, 1902. Serial No. 105,657. (No model.)

*To all whom it may concern:*

Be it known that I, MARCUS D. MOORE, a citizen of the United States, residing at Waveland, in the county of Montgomery and State of Indiana, have invented new and useful Improvements in Railway Signaling Apparatus, of which the following is a specification.

My invention relates to improvements in railway signaling apparatus of that kind or style actuated by the contact of a passing wheel of a car and pneumatic cylinder connections with the signal; and the object is to provide a railway-signal operated from the wheels of the car and so arranged in succession at intervals along the track that a train will give warning of its presence to other trains within the domain of the signal and also so that the signals of the block on the section will indicate "safety" after the train has passed from the block or section.

With these objects in view the invention consists in the novel construction of parts and their arrangement and aggroupment in operative combinations, as will be fully hereinafter specified and the novelty particularly pointed out and distinctly claimed.

I have fully and clearly illustrated the invention in the accompanying drawings, wherein—

Figure 1 is a diagrammatic plan of a section of railway as equipped with my improved signaling mechanism. Fig. 2 is a transverse section through the rails and longitudinal section through the box or casing which contains the track-cylinder and piston and showing the actuating-lever in normal position in the path of the flange of the car-wheel. Fig. 3 is a view similar to Fig. 2, showing the track-lever as being engaged by the flange of car-wheel. Fig. 4 is a detail perspective of the track-lever. Fig. 5 is a view in longitudinal vertical section of the pistons and mechanism for actuating the signal pole or staff. Fig. 6 is a horizontal section of the same mechanism illustrated in Fig. 5. Fig. 7 is a detail perspective of the lower portion of the signal-pole, showing the bearing and operating disk.

It will be premised that the mechanism contemplates the impartation of a rotary reciprocating motion to the semaphore or sig-

nal pole, so that the signal or signals carried thereby will be displayed in the required positions to indicate "danger" or "safety." Any proper and adequate signal may be utilized to serve the object and disclose the information, and for these reasons I have not illustrated, except conventionally in Fig. 1 of the drawings, any particular signal. These may be supplied and accord with those adopted in any signal system appropriate to such mechanical exhibition.

Now having reference to the drawings, A designates a line of railway to which my signaling apparatus is applied. The track is shown as involving two curved sections and an intermediate comparatively straight section, under which circumstances of track location and construction I find it convenient to cross the track with the air tubes or pipes for the curved portions and run the tubes substantially parallel with the line at the straight portion, and thus place the track-lever mechanism on opposite sides of the track and adjacent to each other in the line as indicated in Fig. 1. 1 2 designate the oppositely-laid parallel rails of the track laid and secured on ties 3 in the usual manner. At determined distances in the track, at the terminals of each block or section and extending in succession as may be required, are arranged the track-lever mechanism 4, designated so generally. These are similarities, each comprising a boxing or housing 5, preferably rectangular in conformation and of such dimensions as may be requisite to serve the purpose and provide room for the mechanism mounted therein. A cover 6 is provided for the protection of the inclosed mechanism. In the box 5 is mounted and secured a cylinder 7, constituting an air-cylinder of such capacity and power as may be required to accomplish the actuation of the piston and the communication of the force to the pistons of the signal mechanism. In the cylinder 7 is arranged a piston 8, the rod 9 of which is joined to a pitman 10, the outer end of which is pivotally connected to the lower end of a lever 11, fulcrumed to a lug 12 or between lugs formed on the cover 6, the upper arm 13 of the lever being directed inward toward the rail-flange and formed on



its upper end with an elongated bar or flange 14, adapted to lodge against the edge of the tread-flange of rail. The ends of the flange 14 at their inner edges are tapered or inclined, as shown in Fig. 4, so as to afford ready and proper engagement of the flange of the wheel between inner edge of the flange and the rail to operate the lever and actuate the piston, as indicated in Fig. 3 of the drawings. A leaf-spring 15, arranged to bear inward against the upper arm of the lever, serves to restore both the lever and the piston to normal or initial positions. To accomplish this action with greater ease and celerity, an air-port 16 is provided in the cylinder, through which the air may escape in the reversal of the piston and through which the air will rush in the forward movement of the same. In the outer end of the cylinder is fixed an air-pipe 18, which opens from the interior of the cylinder and projects through the end wall of the box 5 and is led to the desired point the proper distance and opens into one of the piston-cylinders adjacent to the signal.

It will now be perceived that under circumstances of rest the flange 14 lodges against the side of the tread-flange of the rail and that when a car-wheel passes by the flange 14 the flange of the wheel presses the flange, and with it the lever, outward and forces the piston inward to force the air from the cylinder through the pipe 18 into one of the cylinders adjacent to the signal and eventuates ultimately in turning the signal-pole on its axis.

At each signal station or location is a box 19, provided with a cover 20, formed with a central aperture 21, through which the signal-pole 22 passes and is in part supported in vertical position. At each end of the box 19 is fixed a cylinder-bed 23, on which is mounted a cylinder 24, into the heads of which the pipes 18 open against the face of the pistons. In the cylinders are arranged pistons 25, the rods 26 of which are jointed to curved rods 27, having their inner ends pivotally connected to radial points on a wheel 28, fast on a disk 29, mounted fast on the signal-pole 22 at its lower end. A steadying and guide rod 30 is mounted on the projecting portions of the piston-rods, having its ends provided with eyes or passages 31, through which the rods are free to move. On the piston-rods, within the cylinders, are mounted expansive springs 32, which serve to hold the pistons in normal positions and to return the signal-pole to initial indication when the pressure on the pistons has been released. The cylinders 24 are each provided with an air-port 33 for the entrance and outlet of air.

The signal-pole has its lower end formed conical, as at 34, and engages in a step-bearing 35, and fixed under the disk 29 is a collar 36, formed with a notch 37, in which a spring-actuated pawl or catch 38 engages to hold the signal-pole in normal position and to keep it from swinging beyond this point after hav-

ing been turned on its axis. The signal-pole is held and braced upright by means of a collar 39, loosely mounted thereon, and brace-rods 40, extending therefrom, with their lower ends secured to the cover of the box, as shown.

The operation may be stated as follows: The normal condition or position of the track-lever and piston is shown in Fig. 2 of the drawings and that of the signal-turning mechanism in Fig. 5 of the drawings. When in these positions, if a car-wheel passes over the track-lever the flange of the wheel passes between the flange of the track-lever and the tread of the rail and pushes the lever away from the rail and moving the piston forward in the cylinder, which forces the air from the cylinder through the pipe 18 into the cylinder 24 against the face of the piston 25, which through its connections with the wheel on the signal-pole turns that element with the signal thereon the required distance to display the signal in the new position. At the same time the piston in the other cylinder is drawn toward the inner end and the remote signal also turned to indicate "danger" or is restored to normal position. When the track-lever is restored to normal position, it acts on the associated pistons and restores the signal to original position. It is apparent that the signals are operated by trains moving in either direction.

Having thus described my invention, what I claim is—

1. In a pneumatic railway signaling apparatus, the combination of an air-cylinder, a piston in the cylinder, a laterally-movable track-lever connected to the piston and formed with a flange between which and the rail the flange of a car-wheel passes to actuate the lever and piston, a signal-pole arranged to turn on its axis, a cylinder adjacent to the signal-pole, a piston therein connected thereto to turn the signal-pole, and an air-pipe connecting the said cylinders.

2. In a pneumatic railway signaling apparatus, the combination of a vertical signal-pole rotary on its axis, a wheel mounted on the base of the pole, a cylinder, a piston in the cylinder having connection to the wheel on the signal-pole, an air-pipe leading into the cylinder, a laterally-movable lever actuated by the flange of a passing wheel, and means actuated by the lever substantially as described located adjacent to the track to force air into the cylinder.

3. A pneumatic railway signaling apparatus, comprising a signal-pole turnable on its axis, a wheel mounted on the base of the pole, a cylinder, a piston in the cylinder connected to the wheel on the pole to turn it, an air-cylinder at the track, a piston in the cylinder, a lever arranged to be operated by the flange of a car-wheel and operate the piston, and an air-pipe connecting the cylinder at the pole with the cylinder at the track.

4. A pneumatic railway signaling appara-



tus comprising a vertically-rotatable signal-  
pole, a wheel mounted on the pole, oppositely-  
disposed air-cylinders, pistons in the cylin-  
ders, having their rods connected to the  
5 wheel on the the pole, air-pipes leading into  
the cylinders, and means to force air through  
the pipes, substantially as described.

In testimony whereof I affix my signature  
in presence of two witnesses.

MARCUS D. MOORE.

Witnesses:

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JOHN T. MOORE.