(No Model.) 2 Sheets—Sheet 1.

E. J. FORREST & G. W. BACON.

RAILROAD BLOCK SIGNAL.

No. 310,129. Patented Dec. 30, 1884.

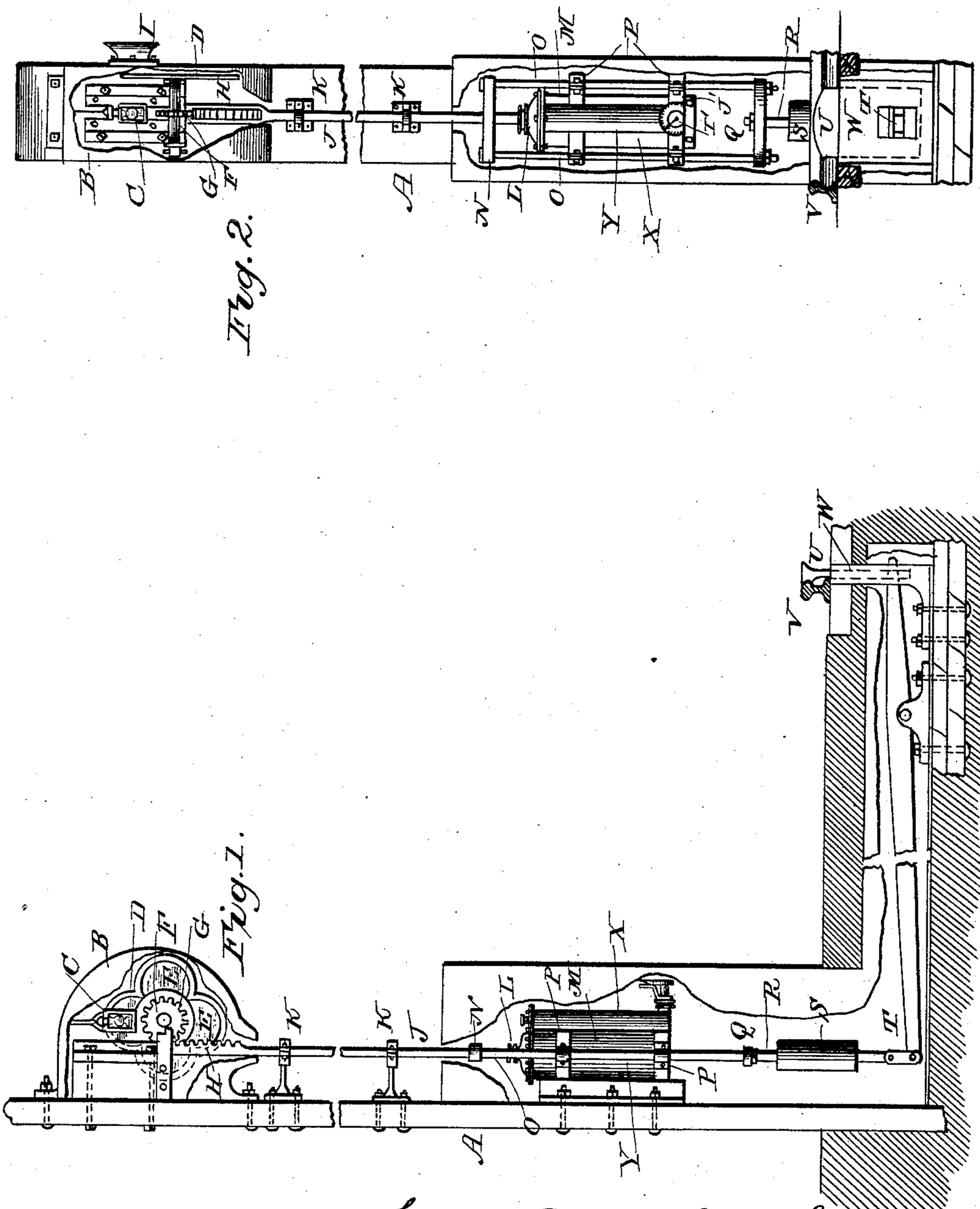

Fig. 2.

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig 3

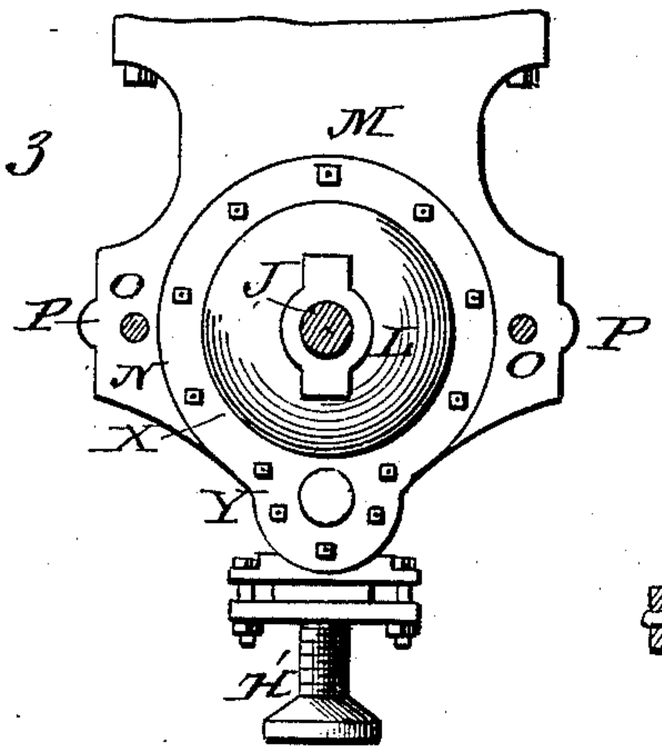


Fig. 5.

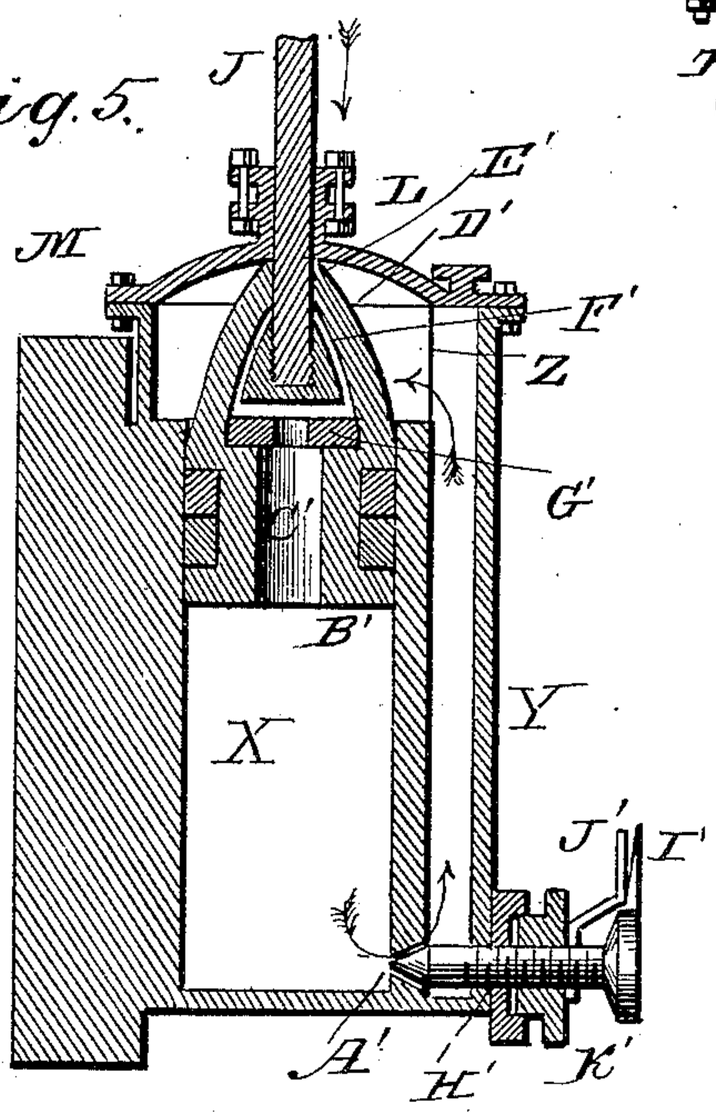
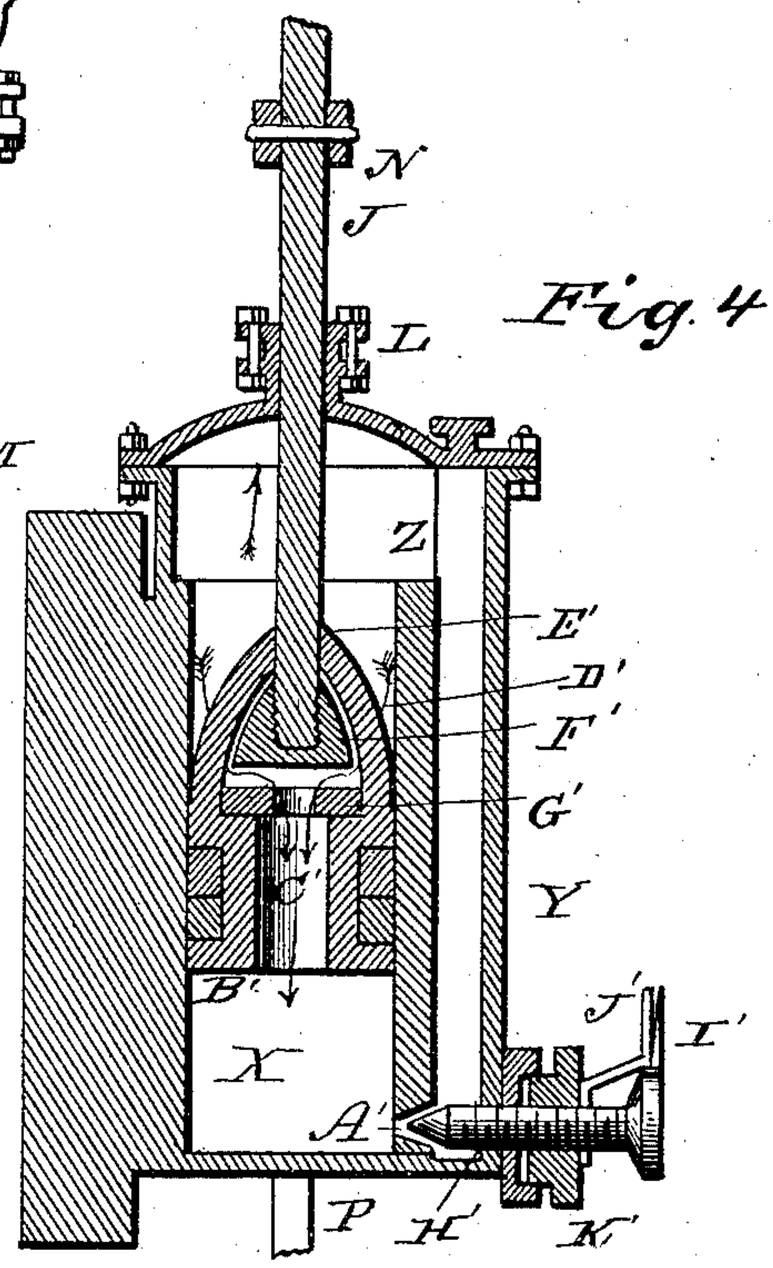
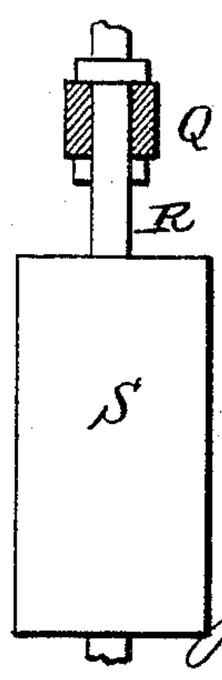


Fig. 4





E. J. Forrest and Geo W Bacon INVENTORS

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WITNESSES:

Fred. L. Dieterich.

Chas. F. Fecker.

UNITED STATES PATENT OFFICE.

EARNEST J. FORREST AND GEORGE W. BACON, OF PITTSBURG, PA.

RAILROAD-BLOCK SIGNAL.

SPECIFICATION forming part of Letters Patent No. 310,129, dated December 30, 1884.

Application filed August 8, 1883. (No model.)

To all whom it may concern:

Be it known that we, EARNEST J. FORREST and GEORGE W. BACON, citizens of the United States, and residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Railroad-Block Signals; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of the specification, and in which—

Figure 1 is a front view of our improved railroad-block signal, showing portions of the inclosing-casing broken away. Fig. 2 is a side view. Fig. 3 is a top view of the plunger-cylinder; and Figs. 4 and 5 are vertical sectional views of the same, showing the plunger in the act of being raised and in the act of descending.

Similar letters of reference indicate corresponding parts in all the figures.

Our invention has relation to that class of railroad time-signals in which the signal, after being set either by a passing train or by an operator, is changed during a given time, being operated by a plunger descending in a cylinder containing a fluid, which, by gradually escaping from the cylinder, will allow the plunger to descend; and it consists in the improved construction and combination of parts of the same, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates an upright post, at the top of which is secured a casing, B, which contains a lamp, C, and a disk, D, having a number of plates, E, of different-colored glass arranged equidistant around the central shaft, F, of the disk, upon which shaft is a pinion, G, which is engaged by a cogged rack, H, the said shaft being journaled in bearings in the sides of the casing below the lamp, the plates in the disk being capable of registering with the lamp, and an aperture, I, in the side of the casing as the disk is revolved by the rack. The rack is formed upon the upper end of a rod, J, which slides in vertical bearings in the ends of brackets K, projecting from the upright, and the lower portion of the rod slides through a stuffing-box, L, in the plunger-cylinder M, which will be described later, while a yoke or cross-head, N, is secured upon the rod above the head of the plunger-cylinder, to the ends of which cross-head two parallel rods, O O, are secured, which rods slide in vertical bearings P, projecting from the sides of the plunger-cylinder, and are connected at their lower ends by a cross-head, Q, to the middle of which a vertical rod, R, is again secured, which rod is provided with a weight, S, and is pivoted at its lower end to the inner long arm of a lever, T. This lever is pivoted beneath the surface of the track, and has the lower end of a vertically-sliding plate, U, resting against it, the said plate projecting upward at the inner side of the rail V of the track, adapted to be depressed by the flanges of the wheels of the passing train; and sliding in a vertical box or bearing, W. The plunger-cylinder is secured upon the upright post, and consists of a larger cylinder, X, and a smaller cylinder, Y, opening into the larger cylinder, at the upper end of the same, through an aperture, Z, secured parallel with the larger cylinder upon the side of the same, and connecting at its lower end with the larger cylinder through a conical bore, A′, passing through the wall separating the two cylinders. The plunger B′, which slides perfectly tight in the larger cylinder, has an axial perforation, C′, and a stirrup or bail, D′, at its upper end, which forms a vertical bearing, E′, at its upper end, in which the lower end of the vertical rod J slides, and the said rod is provided at its lower end, below the bearing in the stirrup, with a conical valve, F′, the lower and wider end of which fits upon a seat, G′, upon the top of the plunger, covering the axial perforation in the same, the vertical rod having sufficient play in its bearing in the stirrup to allow the valve to be raised off from its seat when the rod is drawn upward. The inner conical end of a screw-plug, H′, fits in the conical perforation connecting the lower ends of the two cylinders, and the head of the said plug is provided with an index-finger, I′, pointing to a graduated scale upon a dial, J′, secured upon the box K′, through which the screw-plug passes into the smaller cylinder, concentric

with the said box and plug. It will now be seen that as the passing train bears down with the flanges of its wheels upon the vertically-sliding plate at the track the outer end of the lever will be depressed and the inner end of the lever will be raised, raising the vertical rods, the weight, and the plunger, the cogged rack operating the pinion and setting the signal upon "danger," which in general usage is shown by a red-colored plate exhibited through the opening in the upper casing, and illuminated by night by the lamp in the casing. The plunger-cylinder being filled with air or any other suitable fluid medium, it will be seen that as the plunger is raised the valve at the top of the plunger will be raised and allow the said fluid medium to pass from the upper portion of the cylinder into the lower portion, as shown in Fig. 4, the conical form of the valve allowing the air to pass freely around it and through the perforation in the plunger. When the plunger has reached its highest position, the weight upon the lower vertical rod will commence to force the plunger downward, the upper vertical rod forcing the valve to bear against its seat, and the fluid medium in the cylinder will be forced out of the larger cylinder through the small conical aperture at its lower end into the smaller cylinder, from which it will pass into the upper portion of the larger cylinder.

It will be seen that the flow of the medium from the larger cylinder into the smaller may be regulated by the screw-plug H', by screwing it farther in or out, the descent of the plunger being accordingly slower or faster, and after having by experiment ascertained the length of time required for the descent of the plunger at different adjustments of the screw-plug, and after having marked the positions of the index upon the said plug at the several adjustments upon the dial, the signal may be set to indicate any space of time which is required to pass before the danger-signal will be changed.

It will be seen that by having several colored disks or plates arranged in order in the revolving disk, and by having the different colors indicating "danger," "caution," or "go ahead," or "all clear," the cogged rack will revolve the pinion and the disk with it, so that the several different colored plates will be exhibited in their time, enabling the engineer of the train following the train which set the signal to know at which point on the following section the said preceding train will be, enabling him to regulate his speed and his movements with regard to the said train.

We are aware that it is not broadly new to have railway time-signals in which the differently-colored targets or signal-disks, after the signal has been set, are changed in a given time by a plunger descending in a cylinder containing a fluid, which, by gradually escaping, allows the said plunger to descend; and we are also aware that it is not new to have differently-colored disks arranged around a center and displayed by turns by revolving said disks around the said center, and we do not wish to claim such construction, broadly; but we claim—

In a railway time-signal, the combination of a large cylinder, a smaller cylinder connected by an aperture at its upper end with the upper end of the large cylinder, and having a conical aperture at its lower end opening into the lower end of the larger cylinder, the said smaller cylinder being secured upon the side of the larger cylinder parallel with the same, a plunger having an axial perforation formed with a flat valve-seat at its upper end, and provided with a bail or stirrup at its upper end, said bail having a vertical bearing in its upper end, a vertical rod operating the signal and having a weight forcing it downward, the lower end of the said rod sliding in the bearing in the bail, a conical valve fitting with its lower wider end upon the valve-seat of the plunger, and secured to the lower end of the vertical rod, a screw-plug passing through the side of the lower end of the smaller cylinder, fitting with its conical end in the conical perforation connecting the cylinders, and provided with an index-finger at its outer end, and a dial or scale graduated to register with the index-finger, showing its different adjustments, as and for the purpose shown and set forth.

In testimony whereof we have hereunto set our hands this 1st day of August, A. D. 1883.

EARNEST J. FORREST.
GEO. W. BACON.

Witnesses:
JOHN S. KENNEDY,
JNO. K. SMITH.