

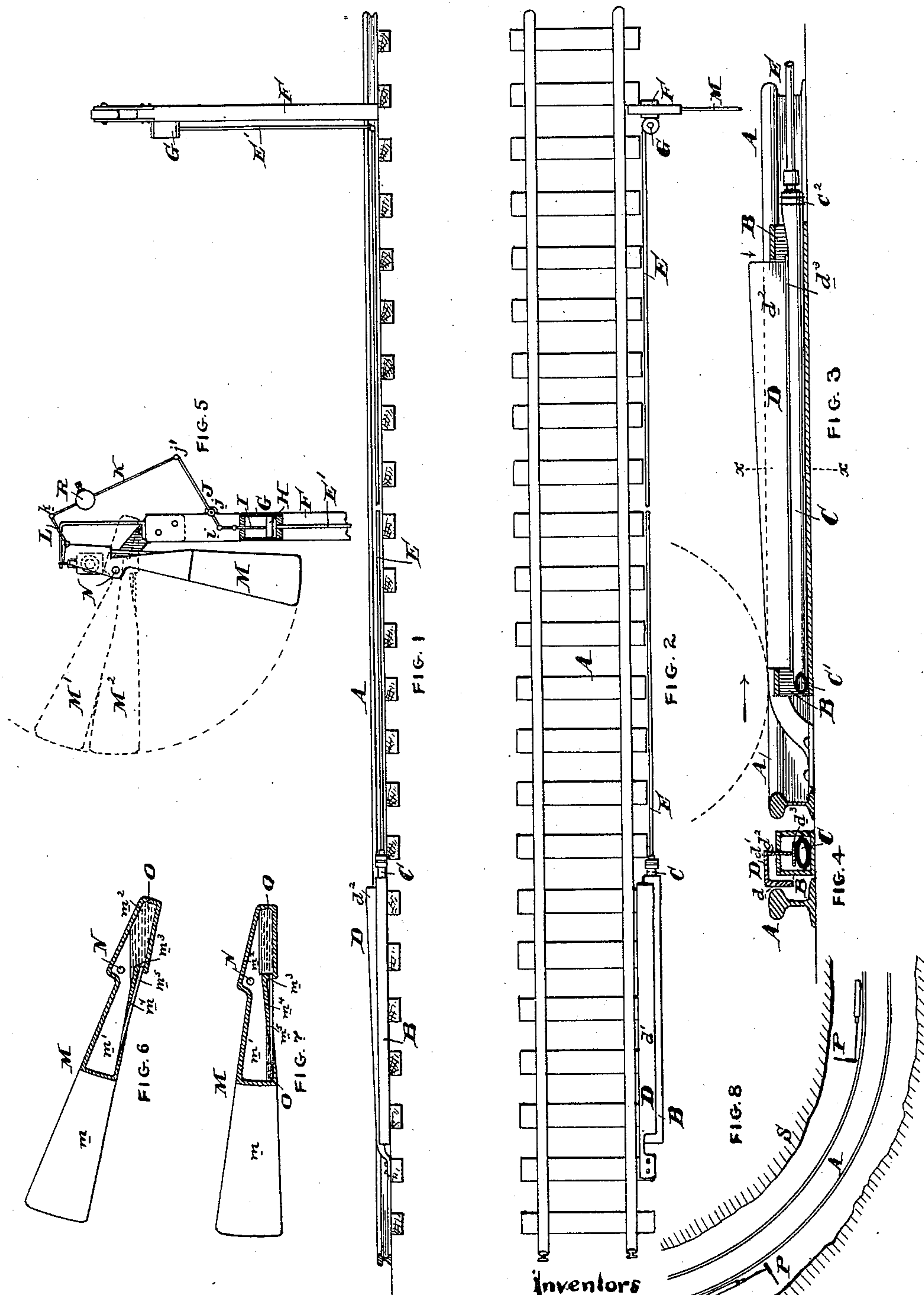
(No Model.)

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RAILWAY TIME SIGNAL.

No. 433,906.

Patented Aug. 5, 1890.



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UNITED STATES PATENT OFFICE.

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RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 433,906, dated August 5, 1890.

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To all whom it may concern:

Be it known that we, JOHN F. O'BRIEN, of Youngstown, county of Mahoning and State of Ohio, and SAMUEL H. HARRINGTON, of Cleveland, county of Cuyahoga and State of Ohio, have invented a new and useful Improved Automatic Semaphore-Signal, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to the construction of a semaphore-signal for railway use, and has for its object to provide a semaphore which, normally resting in the position indicating "safety," will, by the passage of a train in a given direction, be set to the position indicating "danger," and maintained in said "danger" position for a regulated length of time.

Our invention consists in a semaphore-signal blade constructed and arranged, as hereinafter described, so that when raised to the "danger" position it will remain there for a regulated time before falling to "safety."

Reference is now had to the drawings, which illustrate our invention, and in which—

Figure 1 is a side view of a railway-track equipped with our improved device; Fig. 2, a plan view of the same; Fig. 3, a side view, partly in section, of a device which we propose to use for actuating the semaphore; Fig. 4, a cross-section on the line $x x$ of Fig. 3; Fig. 5, an elevation of the signal-post on which our improved semaphore is supported, said semaphore and the immediate devices by which it is actuated being also shown; Figs. 6 and 7 are partly-sectional views of our improved semaphore in the positions indicated by the dotted lines M' and M^2 on Fig. 5, and Fig. 8 is a view of a railway-track running through a curve with high embankments and provided with our improved semaphore-signal.

A indicates the railway-track.

B is a box placed alongside of one of the rails of the track and having an opening at its top.

C is a rubber hose, say, three inches in diameter and about ten feet in length. This hose is placed in the box B, is open at the

end marked C' , while at the end marked C^2 it is united to a small iron pipe E.

D is a bar or frame arranged alongside of the track, so as to be depressed by the passage of a wheel over said track, said bar or frame resting also on the rubber pipe C. As shown in the drawing, and when used in connection with the box B containing the rubber pipe, the device D should preferably be constructed as shown in Figs. 3 and 4—that is, consisting of wedge-shaped bars d and d^2 united by a cross-bar d' , the bar d^2 having at its bottom a flat cross-bar d^3 , which rests upon the pipe C.

E, as already described, is a small metal pipe connecting with the rubber pipe C and extending, as shown, to the signal-post F.

E' is a continuation or branch of the pipe E leading to the bottom of a cylinder G.

H is a piston moving in the cylinder G.

I is a piston-rod jointed at i to a lever J, pivoted to the frame at j . The outer end of the lever J is pivoted at j' to a link K, which, in turn, is pivoted at k to an arm L, extending out from the end of the semaphore.

M is the semaphore pivoted to a bracket on the post F at N. The semaphore is represented in Fig. 5 as in its normal position, the dotted lines M' representing its position when actuated, so as to move to the "danger" position, and the dotted lines M^2 representing it in the position it occupies for a regulated period of time (say, five minutes) before descending again to its normal position of "safety."

R is a balance-weight secured on link K.

Our improved semaphore is constructed in the manner shown in Figs. 6 and 7—that is, it is made up of a blade m , of ordinary size and dimensions, pivoted so as to oscillate in a vertical plane and united to a water-tight box or casing extending on both sides of the pivot N and divided by a step or partial partition m^3 into two divisions m' and m^2 . From the top of step m^3 we make the bottom of the division m' slope gradually backward, as indicated at m^4 , to the bottom of chamber m' , while it forms an abrupt wall in chamber m^2 , and we unite the bottom of the two divisions m' and m^2 by a drip-pipe m^5 , through which water or quicksilver will pass very slowly.

O in Figs. 6 and 7 indicates water or other

fluid with which the box of the semaphore is partially filled, as indicated in the figures.

In Fig. 8 S indicates the high bank on the inside of the curve, while P P indicate the positions which our improved semaphore-signals would occupy on such a track, this view indicating the position and circumstances under which our invention is peculiarly efficient.

The operation of our device can readily be followed on the drawings. The pipe C is placed in such position with respect to the track that its open end C' will be in the direction from which the travel comes. The locomotive or car wheel—such as is indicated by dotted lines in Fig. 3—will press the bar or frame D down, closing the end C' of the rubber pipe C, and as the car moves forward the wedge-shape bar D will gradually press down along the length of the pipe C, pressing the air in it into pipe E, through which it passes to branch E' and into the bottom of cylinder G, where it pushes the piston H upward, and, acting through piston-rod I, lever J, link K, and bar L, pulls the semaphore up to the position indicated by M' in Fig. 5. When the semaphore is in the normal position, indicated by M, Fig. 5, the water or other fluid contained in its box-like portion is of course all in the chamber m' . When it is thrown up to the position indicated at M' and in Fig. 6, the liquid all flows over the inclined bottom of the chamber m' into the chamber m^2 , thus changing the center of gravity of the semaphore-arm, so that it will stand substantially horizontal. The semaphore-arm and its connections must be so balanced and adjusted as to move from the position indicated at M' to that indicated at M² as soon as the actuating force which raises the arm to M' ceases to act. When the semaphore is in the position shown at M², the water finds its way gradually through the drip-pipe m^5 from chamber m^2 to chamber m' , these chambers, the quantity of water, and the size of the orifice in the drip-pipe being so proportioned that the center of gravity of the semaphore-arm will remain on the inside of its pivot for the desired length of time, (say five minutes,) at the end of which sufficient water will have passed through the drip-pipe in the chamber m' to change the center of gravity to the outside of the pivot and bring the semaphore back to the normal position indicated in Fig. 5.

It is important that the partition m^3 should form an abrupt wall to chamber m^2 in order to offer resistance to a backward flow of the fluid over the partition, while the inclined bottom and side which the partition forms in chamber m' is necessary to enable the fluid to flow freely over it when the semaphore is thrown up.

The balance-weight R is a safety device, the function of which is to bring the semaphore-signal to the "danger" position in case the fluid or water in the box m' m^2 should escape. As long as the water remains in the apparatus the weight R would have no function and would not interfere with the operation of the device. It is, however, so placed and of such weight as to hold the semaphore to "danger" when the water has escaped from it. The relative position of what we call the "water-boxes" with respect to the pivot will of course depend on the balance of the arm or other devices connected with them, the essential feature of construction being that by the change of fluid from one box to the other the center of gravity should be changed from one side to the other of the pivot. Any fluid or fluid-like body can of course be used instead of water.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

A semaphore-signal pivoted so as to oscillate in a vertical plane having in combination two chambers arranged so that the transfer of a given weight from one to the other will change the center of gravity of the semaphore from one side to the other of its pivot, a step or partial partition separating said chambers at their bottoms, but having a connecting-passage at the top, said step or partial partition sloping gradually from the bottom of the chamber, in which the weight tends to cause the semaphore to fall and forming an abrupt wall in the other chamber, and a drip-pipe connecting the two chambers below said step or partial partition.

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