

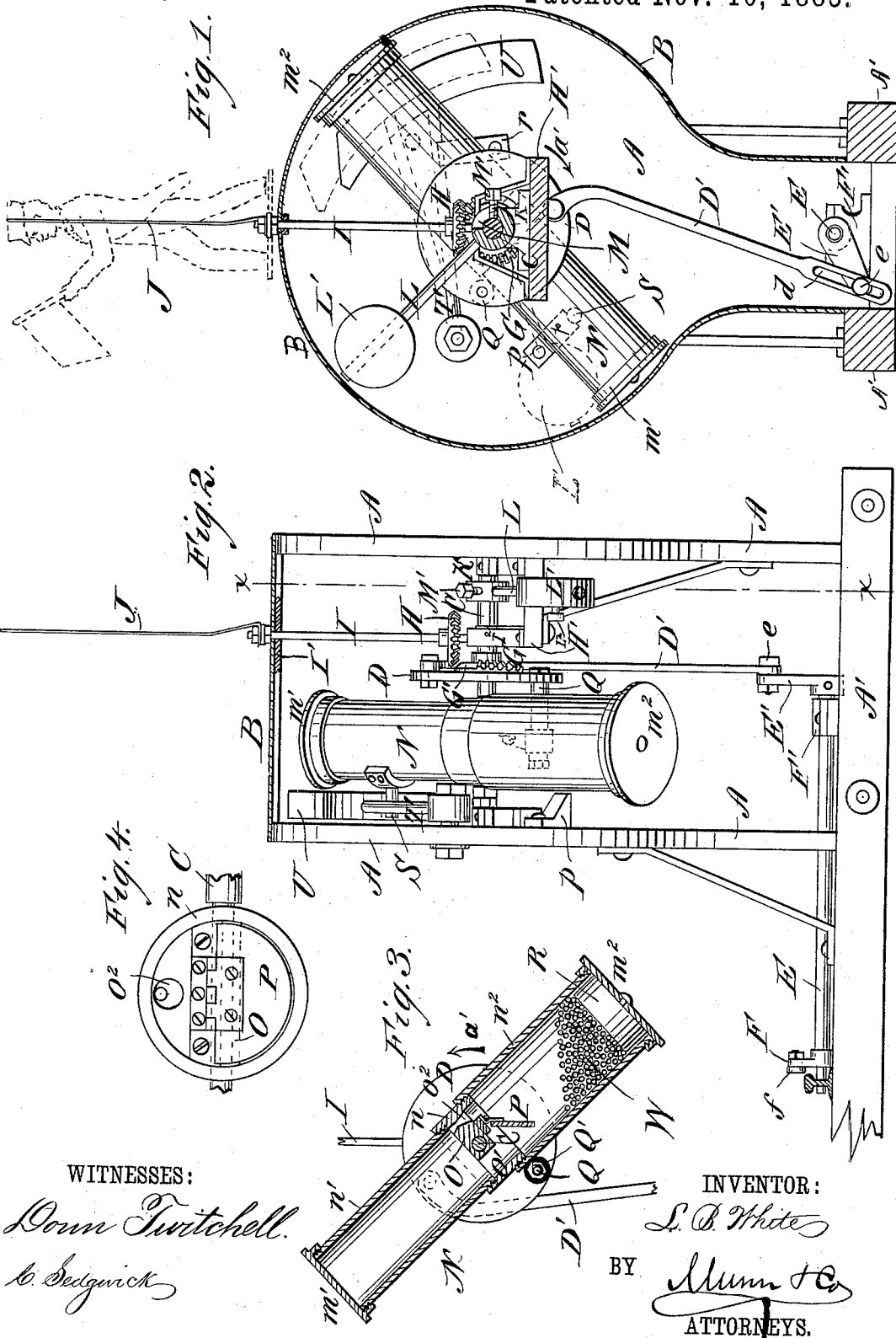
(No Model.)

L. B. WHITE.

AUTOMATIC BLOCK SIGNAL FOR RAILWAYS.

No. 330,180.

Patented Nov. 10, 1885.



WITNESSES:

Down Twitchell.
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AUTOMATIC BLOCK-SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 330,180, dated November 10, 1885.

Application filed May 27, 1884. Serial No. 132,918. (No model.)

To all whom it may concern:

Be it known that I, LEWIS BOYD WHITE, of the city, county, and State of New York, have invented a new and Improved Automatic Block-Signal for Railways, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved block-signal which is set automatically by a passing train or locomotive and remains set for a given time, and then swings back into its normal position.

The invention consists in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which the same letters of reference indicate the same or corresponding parts in all the figures.

Figure 1 is a cross-sectional elevation of my improved block-signal on the line *x x*, Fig. 2. Fig. 2 is a side view of the same. Fig. 3 is a cross-sectional elevation of the pivoted cylinder. Fig. 4 is an enlarged detail view of the valve in the same.

Two standards, A A, are secured at the side of the track on a sleeper, A', and are braced and stiffened by means of suitable braces, and the said standards, which are preferably widened at their upper ends, are united by a covering, B, which, with the standards, forms a casing for the apparatus. In the said standards a shaft, C, is journaled, on which is mounted a disk, D, which is connected by a connecting-rod, D', with a crank, E', formed on the inner end of a horizontal shaft, E, journaled in the bearing-block E' within the casing and in the rail, and provided at the end journaled in the rail with a crank-arm, F, which is parallel with the crank E', on the free end of which arm F a roller, *f*, is journaled, which is so located that it can be struck by the wheel of the passing locomotive. The connecting-rod D' is provided in its lower end with a longitudinal slot, *d*, through which a bolt or pin, *e*, in the free end of the crank-arm E' passes. On the surface of the disk D a bevel cog-wheel, G, is formed, which has part of its teeth broken out to form a recess, G', the

length of which is equal to about one-quarter of the circumference of the wheel.

The mutilated cog-wheel G is adapted to engage with a smaller bevel cog-wheel, H, mounted on the lower end of a vertical shaft, I, journaled in a cross-piece, I', uniting the upper ends of the standards, and in a bearing, I'', formed on a bracket, H', projecting from the inner surface of one of the standards. On the upper end of the vertical shaft I a sheet-metal figure, flag, or like device, J, is secured in such a manner that it will turn with the said shaft. On the shaft C a hub, K, is loosely mounted, from which an arm, L, projects, on the outer end of which a weight, L', is secured adjustably by a set-screw, L''. The hub K is provided with a quadrant-slot, M, through which a pin or screw, M', passes into the shaft, thus permitting the hub to have the play of a quarter-circle before acting on the shaft—that is, if the revolution of the shaft is reversed, it will make a quarter-revolution before acting on the hub K.

A cylinder, N, is loosely mounted centrally on the shaft C between the disk D and one of the standards, which cylinder or cylindrical casing N is formed of a central piece, *n*, on which two end pieces, *n'* *n''*, are screwed, and on the outer ends of which pieces *n'* *n''* caps *m'* and *m''*, respectively are screwed. The central tubular piece, *n*, is provided with a cross-piece or partition, O, having a large opening, O', and a small opening, O''. The large opening O' can be closed by a swinging gate, P, adapted to swing into the tube-section *n''*, which has a larger diameter than the section *n'*. A weight, R, is secured to the inner side of the cap *m''*, or the corresponding end of the section *n''* can be weighted in any other suitable manner. An arm, Q, provided with a rubber covering or buffer, Q', projects from the disk D, under the cylinder N. A pin, S, projecting from the side of the tube-section *n'*, is adapted to strike against the stop *p*, projecting from the inner surface of the corresponding standard.

An arm, T, is pivoted to the inner side of one of the standards, and on its free end a weight, U, is secured. From the inner side

of that standard to which the arm T is pivoted a lug or stop, *r*, projects, on which the said arm can rest. The aperture O² in the cross-piece O of the central tube-section, *n*, is preferably tapered from both surfaces of the cross-piece O toward the middle, the opening on the side toward the tube-section *n*² being larger than the other.

The operation is as follows: When the parts are in their normal position, the crank-arms E' and F project upward, the cylinder N rests on the arm Q, and the weighted arm T, which is raised, rests on the pin S of the cylinder N. Shot W is contained in the weighted end of the cylinder—that is, in the end in which the weight R is secured—thus holding the cylinder and the other parts in the above-described position. The figure, flag, or other device J is held parallel with the tracks, and the smooth or recessed part G' of the beveled cog-wheel G is opposite the beveled cog-wheel H, so that the same cannot engage. If a train passes, one of its wheels strikes the roller *f* of the crank F, thereby swinging the crank downward, and also swinging the crank E' down, thus pulling the connecting-rod D' down and causing it to turn the disk D in the direction of the arrow *a*', thereby causing the arm Q to lift the lower weighted end, *n*², of the cylinder and swing the upper end, *n*¹, downward. The weighted arm T descends with the cylinder until the said arm rests on its stop or lug *r*. The impetus given to the cylinder swings it around until its lower weighted end, *n*², has passed to the top and beyond the vertical line, when the weighted end of the cylinder, which is now at the top, swings down until the pin S strikes against the stop *p*, (see Fig. 1,) thus holding the cylinder in place. The shot W is now on the upper surface of the partition or cross-piece O—that is, on the surface facing the cap *m*² of the section *n*²—and the said shot flows through the aperture O² into the now lower section, *n*¹, of the cylinder. As this aperture O² is very small, it takes considerable time for the shot to pass through, which time may vary from four to ten minutes, more or less, as may be desired. The shot cannot pass through the opening O', as the same is closed by the valve or gate P. As the shot accumulates in the lower end of the cylinder—that is, on the cap *m*¹—it weights the same sufficiently to overcome the weight R, and thereby first swings the cylinder N into the vertical position, then the end containing the weight R swings downward, and the shot immediately slides from the section *n*¹ through the opening O' into the section *n*² as the gate P is opened automatically by the reversing of the position of the cylinder. As the weighted end of the cylinder swings down, the pin S on the lighter upper end raises the weighted arm T, which acts as a counterbalance to prevent the heavy cylinder from breaking the other parts of the machine. In this manner the cylinder is reversed in position every time a train passes, and remains in the reverse position until the shot flows

from one end of the cylinder to the other, which takes some time, as the opening O² is made small for this purpose.

When the cylinder is again reversed, the shot can flow back very rapidly, as the opening O' is much larger. At the same time that the cylinder is revolved by the arm Q on the disk D, in the manner described, the shaft C is also revolved, and thereby the shaft I is turned in such a manner that the figure or flag J will be at right angles to the track, and will thus show the danger-signal. At the same time the weighted arm L is raised by the action of the pin M' on the hub K of the said arm. As long as the figure shows the danger-signal the weighted arm L is held in the raised position—that is, when the movement of the shaft C is reversed and it turns in the inverse direction of the arrow *a*' the arm L swings down until it rests on the bracket H', and by the action of its weight turns the shaft I, thereby bringing the figure or flag J in a position parallel with the track. When the weighted end of the cylinder swings downward, it acts on the arm Q of the disk D, and swings the said disk in the inverse direction of the arrow *a*', whereby the connecting-rod D' is pulled upward, and the cranks E' and F are drawn into the vertical position. During this time the arm L rests on its bracket motionless, and to permit the movement of the shaft during the time that the arm L rests on its bracket I have provided the slot M in the hub K.

By forming the cylinder N in sections the quantity of shot may be readily changed, and the gate P may be reached for repair, &c.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a signal apparatus, the combination of the shaft C, a disk, D, secured on the shaft and having a mutilated gear, G, and a pin, Q, secured to it, with a rod, D', connecting the disk with a lever adapted to be operated from a passing train, a cylinder, N, mounted to rotate on the shaft C, and resting below its axis on the pin Q, the signal-shaft I, and gear H thereon, adapted to be operated by the gear G, the cylinder N, consisting of two communicating compartments and having a counterbalancing material.

2. In a signal apparatus, the combination, with the shaft C, the disk D, rigidly mounted thereon and having the mutilated gear-wheel G, and the pin Q, connecting-rod D', adapted to rotate the disk, and the signal-shaft I, having gear-wheel H, operated by said gear G, of the divided cylinder N, loosely mounted on the shaft C and resting below its axis on pin Q, a counterbalancing material within the cylinder, a pin, S, on the outer surface of the cylinder, the pivoted counterbalanced arm T, resting on the pin S, and a stop to limit the movement of said arm, substantially as set forth.

3. In a signal, the combination, with the shaft C, the disk D, secured thereon and having the pin Q, and segmental gear G, of the

signal-shaft I, having the gear H, adapted to be rotated by the said segmental gear, the reversible divided cylinder N, having a counterbalancing material therein mounted loosely on the shaft C and resting below its center on the pin Q, the hub K, mounted to partially rotate on the shaft C, the weighted arm L, secured to said hub, and a stop to limit the movement of said arm L, whereby in reversing the cylinder the weighted arm L will operate the signal-shaft through the medium of the disk, its gear, and the gear, H, substantially as set forth.

4. In a railway block-signal, the combination, with the cylinder N, formed of the sections n , n' , and n'' , and the caps m' and m'' , of the weight R, held in one end of the cylinder, a transverse partition arranged in the middle of the cylinder and provided with two apertures of different sizes, a signal connected with the cylinder and adapted to be operated by the same, and connecting-rods and shafts for oper-

ating or throwing the cylinder by the action of a passing locomotive or train, substantially as herein shown and described.

5. In a railway block-signal, the combination, with the standard A, of the shaft C, the cylinder N, mounted loosely on the shaft and containing shot or other suitable material, the disk D, rigidly mounted on the shaft, the rod D', the shaft E, provided with the cranks F and E', the beveled cog-wheels G and H, the shaft I, the signal J on the top of the shaft I, the hub K, provided with a quadrant-slot, M, the screw M', passed through the quadrant-slot into the shaft, the arm L, formed on the hub K, and the weight L', held on the outer end of the said arm, substantially as herein shown and described.

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Witnesses:

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