

(No Model.)

3 Sheets—Sheet 1.

C. T. BARRETT.
SIGNALING APPARATUS.

No. 461,518.

Patented Oct. 20, 1891.

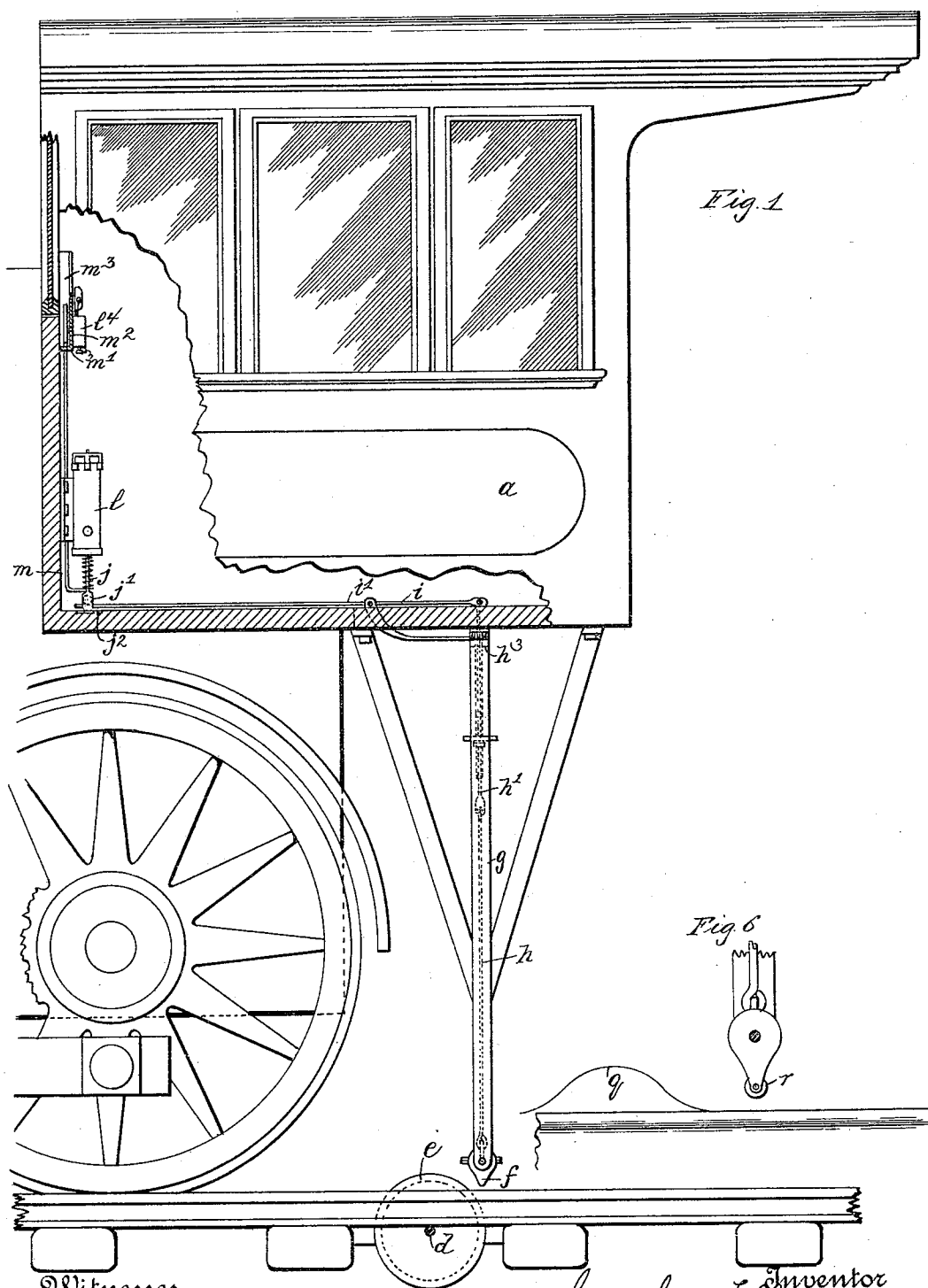


Fig. 1

Fig. 6

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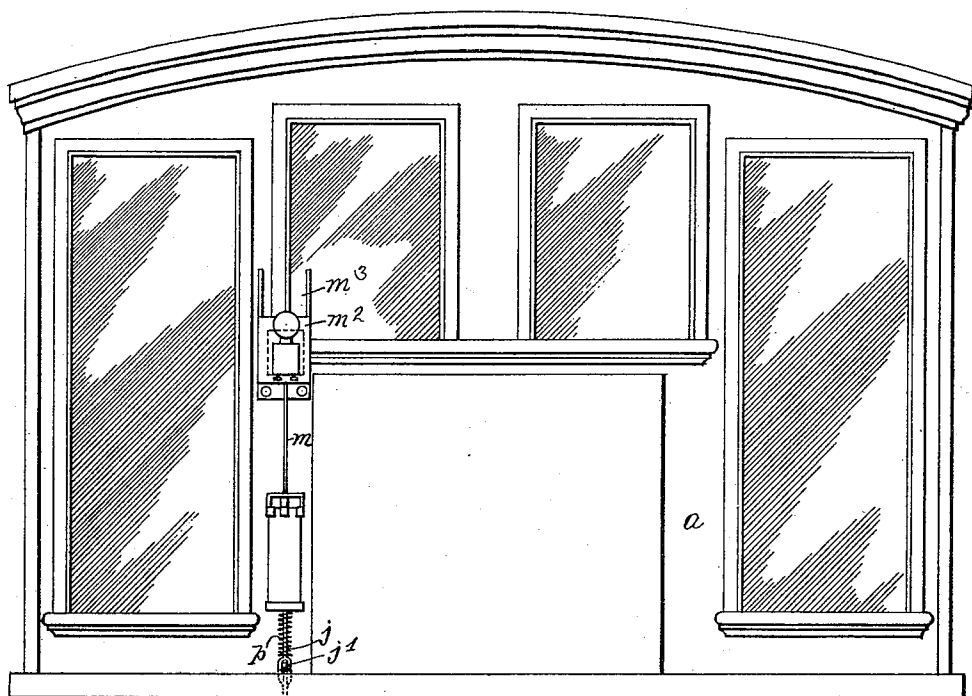
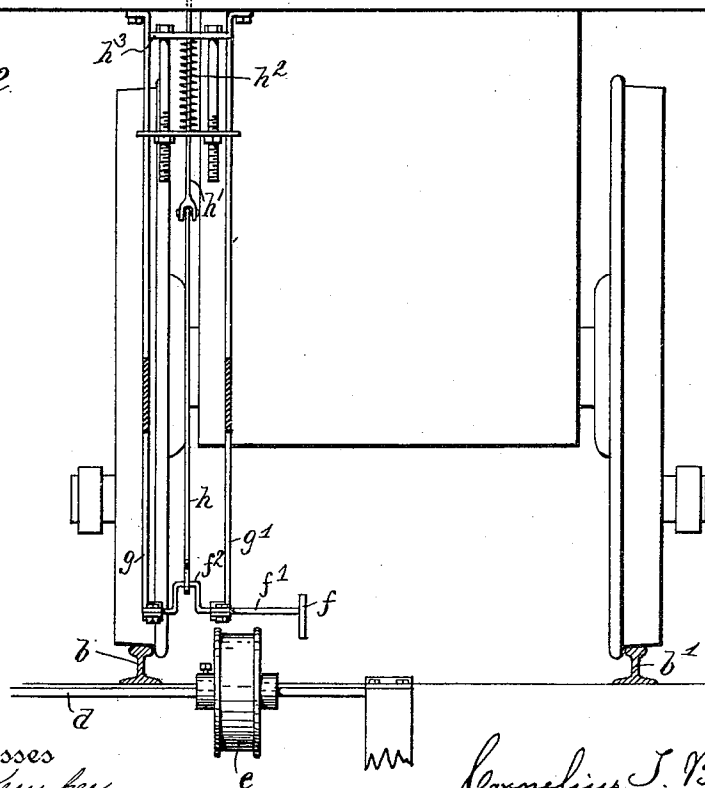


Fig. 2.



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Fig. 4

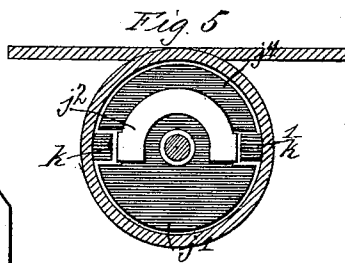
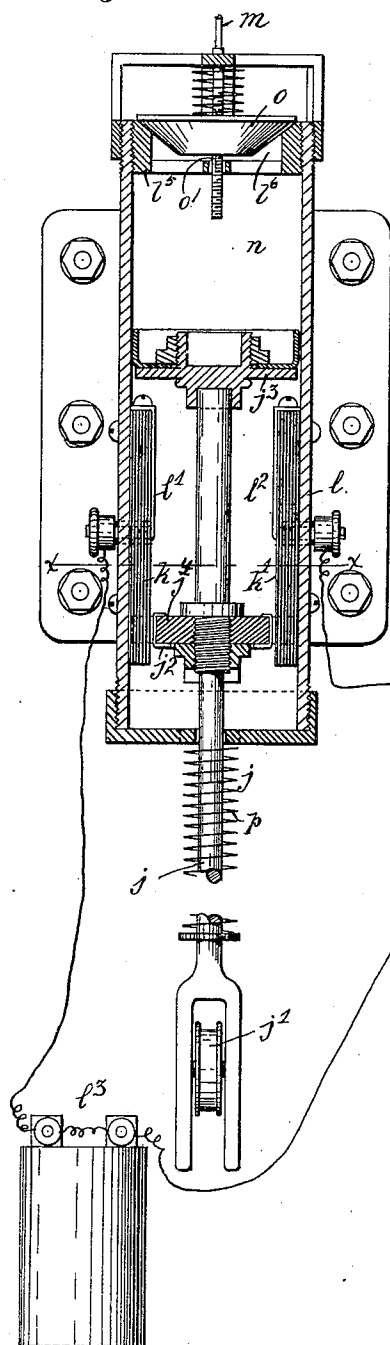
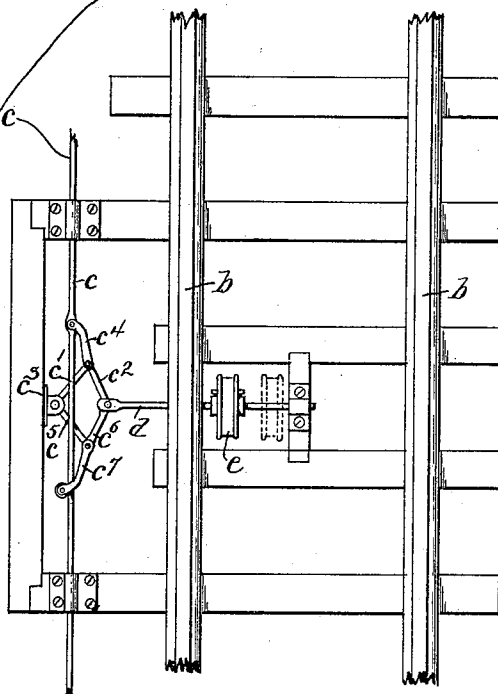


Fig. 3



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UNITED STATES PATENT OFFICE.

CORNELIUS T. BARRETT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-FOURTH TO HARRY W. DOUTY, OF JERSEY CITY, NEW JERSEY.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 461,518, dated October 20, 1891.

Application filed June 5, 1891. Serial No. 395,174. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS T. BARRETT, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Signaling Apparatus, of which the following is a specification.

The object of my invention is to provide means whereby the condition of the switch-signals of a railroad shall be made known by signals located on the car or engine.

In the accompanying drawings, Figure 1 is a side view of the rear portion of a railroad-engine, partly in section, containing my improvement. Fig. 2 is a rear view of the engine. Fig. 3 is a plan view of the track. Fig. 4 is a section of a large portion of the mechanism located in the cab of the engine. Fig. 5 is a cross-section on the line xx of Fig. 4. Fig. 6 is a modification.

a is the cab of the engine.

$b b'$ are the rails.

c is the ordinary reciprocating rod running parallel with the track, which may be attached either to the switches or the signals.

d is a rod reciprocating at right angles with the rod c and having mounted upon it the mechanism, as the roller e , by contact with which the mechanism located upon the engine is to be thrown into operation. The reciprocation of the rod c is caused to reciprocate the rod d by any suitable mechanism—such as, for instance, that shown in Fig. 3, which consists of the toggle-links $c' c^2$, connected at one end with the rod d and at the other end with a stationary piece c^3 and pivotally connected at their junction by the link c^4 with the rod c . In order that the proper direction of motion shall be secured by the action of these toggle-links, the corresponding links $c^5 c^6$ may be employed, pivoted at their junction to a link c^7 , which is guided back and forth upon the rod c .

Now it is evident that when the rod c is in the position shown in Fig. 3 the roller e will be in the position there shown in full lines; but if the rod c be thrown in a direction toward the bottom of the drawings the roller e will be shifted into the position indicated in dotted lines. The first position of this roller will correspond with an arrangement of

switches or signals on the track as to which no signal is desired to be given on the engine, and a second position of the roller will correspond with a condition of signals or switches along the track as to which it is desired to give a signal upon the engine. Therefore the mechanism by which the signals are given on the engine is placed in such position as to be operated by the roller in its second position and not to be operated by the roller in its first position. The roller when in its second position lies in the path of the cam f , which is mounted upon a rock-shaft f' , having bearings in the hangers g and g' , depending from the floor of the cab, as shown in Fig. 1. This rock-shaft is provided with a crank f^2 , which drives a rod h , pivoted to a reciprocating rod h' , mounted in bearings, so as to be held from lateral movement, as shown in Fig. 2. When this rod h' is moved upward by the crank f^2 , it is done in antagonism to a coiled spring h^2 , which is connected at its lower end with the rod, and its upper end bears against a stationary piece h^3 , so as to exert a downward force upon the rod h' in a downward direction. At its upper end the rod h' is pivoted to a lever i , which is fulcrumed at i' and at its forward end enters a slotted opening in the end of a rod j . The arrangement of the slot is such that the upward movement of the forward end of the lever i will raise the rod j by bearing against a friction-roller j' , mounted in the rod j at the upper end of the slot, but so that the downward movement of the forward end of the lever i simply causes the end of the lever to travel downward in the slot without compelling a downward movement of the rod j . In this way, after the lever has forced the rod j upward, it may return to its normal position, leaving the rod j in its upward position. A rubber cushion j^2 may be placed below the lower end of the rod j , so that when that rod returns to its normal position its motions may be arrested without jar.

I will now proceed to describe the means by which the rod j while in its upward position may produce both an audible and a visible signal in the cab, or either of the two, as may be desired, while when the rod is in its normal or downward position no signal is pro-

duced. The rod j extends upward between the two guideways k and k' , which may be located within the lower part of a stationary cylinder l . Adjacent to these guideways for a certain part of their length are placed the electric conductors l' and l'' , one of which is connected with each pole of the battery b , as shown in Fig. 4. In this circuit is also placed the bell apparatus l^3 , so constructed as to ring the bell while the current is closed, but to stop ringing when the current is broken. A cross-piece j^4 is mounted upon the rod j , and is provided with an electrical conductor j^2 , which will make contact between the conductors l' and l'' only when the rod j has lifted the cross-piece j^4 into position between and while it continues between the conductors l' and l'' . Connected with the rod j is also a rod m , which carries a visible signal m' , arranged in its normal position behind the screen m^2 , but displayed through the opening m^3 whenever it is carried upward by the upward movement of the rod j . It will thus be seen that by the mechanism already described neither an audible nor visible signal will take place when the rod j is at or near the lower end of its stroke; but when the rod j is at the upper end of its stroke and while it is descending for a considerable distance from the upper end of its stroke both an audible and visible signal will be displayed, and in order that these signals may be continued for a sufficient length of time I provide means, which I will now describe, for causing the return of the rod j at the lower end of its stroke to be gradual. Above the guideways k and k' the cylinder l is continued, and the rod j is provided with a piston j^3 , fitting and reciprocating within the cylinder, so as to form a water-tight chamber n between the piston and the cylinder-head l^5 , excepting as the air may enter or escape through the valve at the top of the cylinder. This valve o is located so as to open outward in a passage l^6 , leading from the chamber n to the outer air, and consequently as the valve o is forced upward the piston j^3 will cause the air from the chamber n to raise the valve o and escape into the open air; but when the piston j^3 descends the valve o will be seated and will prevent the return of the air, excepting as it finds an entrance through a small channel o' , which may be cut through the valve o or through any other part of the inclosure of the chamber n . The passage l^6 is made large enough, so that the air within the chamber n makes no substantial opposition to the upward movement of the piston j^3 ; but the channel o' is made so small that the downward movement of the piston is retarded by the slowness with which the air can enter the chamber n , and the extent of this retardation can be regulated by the master mechanic of the railroad, who may enlarge or contract the channel o by any suitable means. In many cases it will be found that the weight of the rod j and connected parts will be suffi-

cient to cause it to return to its normal position; but, if necessary, a spring arranged in any suitable position, as at p , may be employed for that purpose.

I have described the retarding of the piston as being accomplished by the partial vacuum produced in the chamber n ; but it will be obvious that the piston j^3 itself operates by friction against the sides of the cylinder, so as to retard the motion to a certain extent independently of the partial vacuum, and such a friction-bearing connected with the rod j may in certain cases be found sufficient without the employment of the partial vacuum.

The electrical conductors l' and l'' and j^2 will of course be suitably insulated, so that the current cannot pass, excepting when the cross-piece j^4 is in the proper position, as described.

The operation of the mechanism is as follows: When the rod c is in the position shown in Fig. 3, the engine will pass without producing any signal in the cab, because the roller e will not lie in the path of the cam or finger f ; but when the rod c has been shifted so as to bring the roller e into the dotted position shown in Fig. 3 it will lie directly in the path of the cam or finger f , so that when the engine comes along that finger will be rocked either forward or backward, depending upon the direction in which the engine is going, and will in either case turn the rock-shaft f' , so as to actuate the mechanism which forces the rod j upward. This will start the ringing of the bell and also display the visible signal m' . As soon as the finger or cam f has passed the roller e the spring h^2 will quickly return all the parts below the rod j to their normal position; but the means already fully described will retard the return of the rod j to a degree which may be regulated by the master mechanic, and in any event long enough to insure that the signals within the cab shall be brought to his attention. Then the rod j will return automatically to its normal position, so as to discontinue the signals and place the whole apparatus in condition to operate over again in the manner described.

With my apparatus the signal may be given, as described, by the making of an electric circuit located entirely upon the engine or vehicle and not requiring for its operation any electrical contact with the ground or other object disconnected from the vehicle, the mechanical connection with the roller located by the track performing the function of changing the condition of the circuit upon the vehicle. The signal may be given by the making of the circuit, as described, or by any other change in the condition of the circuit which will operate to produce a signal.

In lieu of the roller e , an inclined surface q may be employed, as shown in Fig. 6, mounted similarly to the roller, so as to be reciprocated transversely of the track. In this case the finger f will be provided with a friction-roller

7, mounted in suitable bearings at its extremity, so as to glide easily over the incline. I claim—

1. In a contrivance for operating a signaling apparatus located on a car or vehicle, in combination, a finger *f*, a support for the same upon the vehicle so arranged that the finger may be moved by a projection along the track whether the vehicle be moving forward or backward, a vertical rod, connections between the finger and the rod whereby the movement of the finger in either direction produces the same vertical movement of the rod, a spring in antagonism to which the rod is moved by the finger, a signaling device upon the vehicle, connecting mechanism between said rod and said signaling device constructed substantially as described, whereby the movement of the rod under the action of the finger thrusts the signaling mechanism into operative position and the return of the rod is made independently of the signaling mechanism, substantially as described.

2. In a contrivance for operating a signaling apparatus located on a car or vehicle, in combination, a reciprocating rod or piece, a signaling apparatus, means whereby the signaling apparatus is operated when said reciprocating rod or piece is at or near one end of its stroke, mechanism adapted to bear against said reciprocating rod or piece, but disconnected therefrom, whereby after shoving said rod or piece the mechanism may return to its normal position ahead of the same, a vertical rod extending from said mechanism to the level of the track, a crank-shaft connected with the lower end of said vertical rod, and a finger mounted upon said crank-shaft and adapted to reciprocate said vertical rod by a movement in either direction, substantially as described.

3. In combination, a roller by the track mounted on a reciprocated bearing, a finger *f*, a crank-shaft *f'*, a rod *h*, a lever *i*, a rod *j*, connected with said lever, substantially as described, whereby the movement of the lever in one direction thrusts the rod, but its move-

ment in the other direction is made independently of the rod, and a signaling apparatus arranged to be thrown into operation by the thrusting of said rod, substantially as described.

4. In combination with a signaling apparatus located on a car or vehicle, a pivoted finger on the vehicle, mechanism interposed between said finger and said signaling apparatus, whereby the oscillation of the finger causes the signal to be given, a roller by the track, and a reciprocating shaft on which said roller is free to revolve, whereby when the finger strikes the roller the rolling motion of the latter is communicated to the former, substantially as described.

5. In combination with an electric signaling apparatus located on a car or vehicle, the following parts for putting the same into operation, viz: a reciprocating rod, electric contacts arranged parallel with the line of movement of said rod and a contact adapted to bridge the space between said contacts when the rod is at or near one end of its stroke, a finger mounted upon the vehicle near the level of the track, mechanism interposed between said finger and said rod, whereby the rod is shoved in one direction, means whereby said finger and said mechanism are returned to their normal position independently of said rod, and means whereby the return movement of said rod is retarded, substantially as described.

6. As a means by the track for actuating a signaling apparatus on a car or vehicle, in combination, the roller *e*, the reciprocating shaft *d*, upon which it is free to revolve, the reciprocating rod *c*, the toggle-links *c'*, *c''*, *c'''*, and *c''''*, the link *c''''*, connected with the rod *c* and the toggle-links on one side, and the link *c'*, connected with the toggle-links on the other side and guided by the rod *c*, substantially as described.

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