

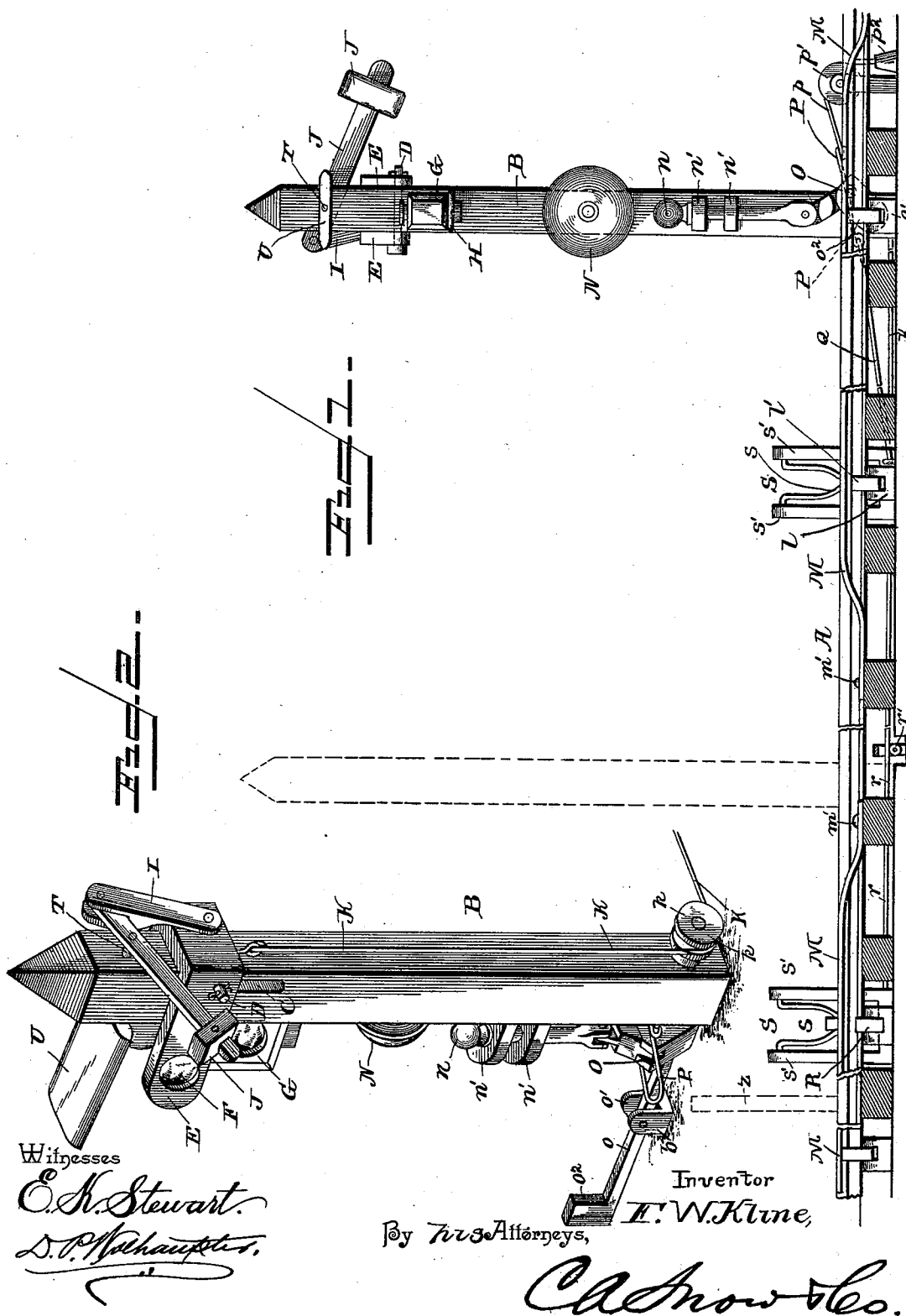
(No Model.)

2 Sheets—Sheet 1.

F. W. KLINE.
RAILWAY BLOCK SIGNAL.

No. 506,005.

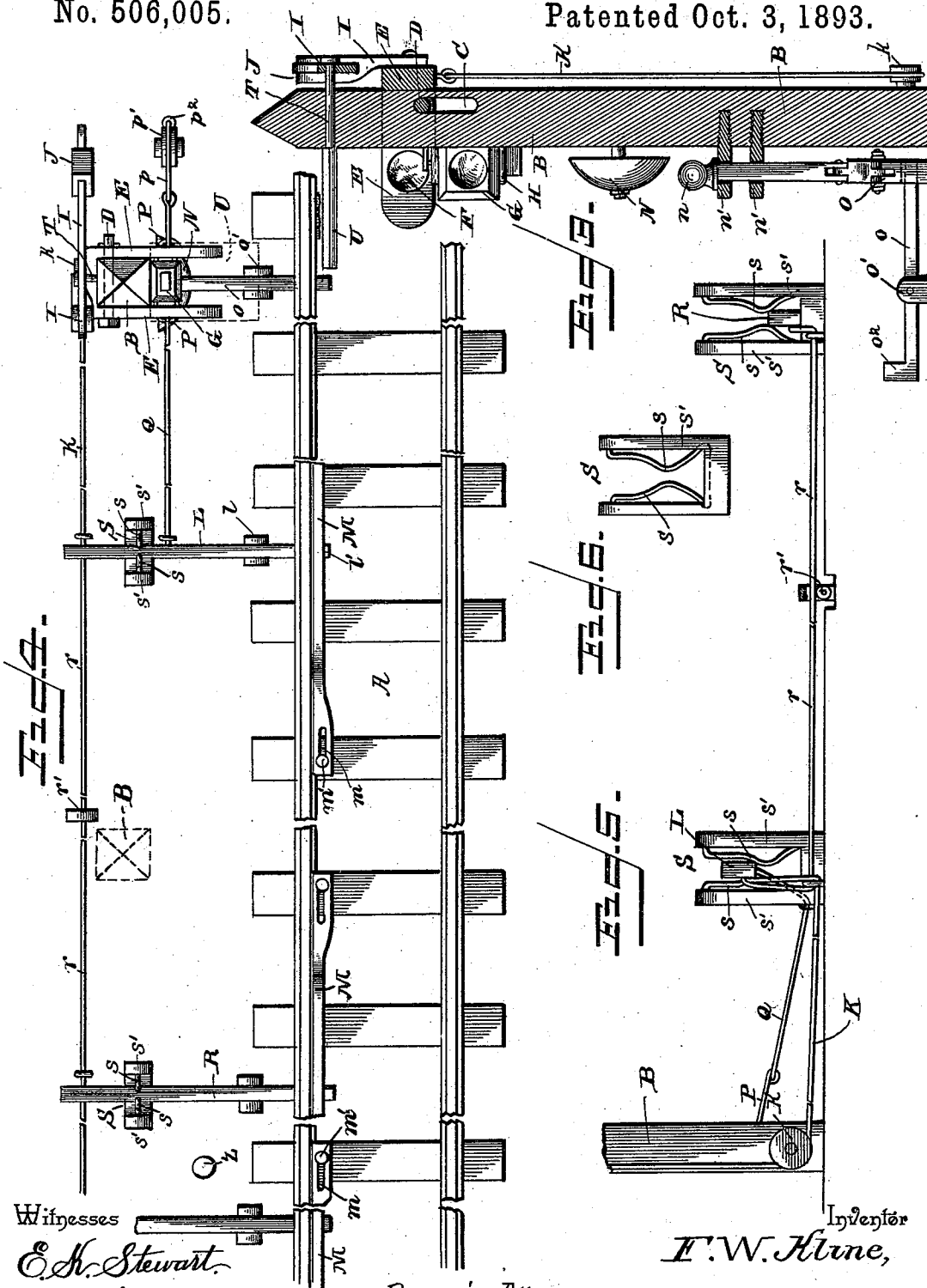
Patented Oct. 3, 1893.



2 Sheets—Sheet 2.

No. 506,005.

Patented Oct. 3, 1893.



Witnesses

E. H. Stewart.

S. P. Walhaug.

By *his* Attorneys,

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

FRANK W. KLINE, OF NORTH GERMANTOWN, NEW-YORK.

RAILWAY BLOCK-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 506,005, dated October 3, 1893.

Application filed January 17, 1893. Serial No. 458,729. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. KLINE, a citizen of the United States, residing at North Germantown, in the county of Columbia and State of New York, have invented a new and useful Railway Block-Signal, of which the following is a specification.

This invention relates to railway block signals; and it has for its object to provide a combined light and alarm signal apparatus adapted to be used in connection with the ordinary block system, in which the roads are divided up into blocks or divisions of suitable lengths.

To this end the invention primarily contemplates an automatically controlled block signal which is operated by the trains themselves, and which are so arranged in the blocks, as to actively indicate at day or night to the engineer of the train, whether the block upon which he is entering is free from obstructions or not, and also to indicate whether another train is on the same block ahead of that train about entering thereon. In short, the apparatus is adapted to indicate all proper signals to the engineer.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts, hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a front view of a block signal apparatus arranged at one side of the track, one rail of track showing. Fig. 2 is an enlarged detail in perspective of the signal pole and the signaling devices thereon. Fig. 3 is a central vertical longitudinal section view of the signal pole and the signal devices thereon. Fig. 4 is a plan view of the apparatus showing the fan board day signal in dotted lines. Fig. 5 is a detail plan view of the wire connections. Fig. 6 is a detail elevation of one of the spring lever catches.

Referring to the accompanying drawings, A represents a section of a track, alongside of which is arranged the signaling apparatus for one block, as herein described and set forth. At about the middle of each block and at one side of the track is arranged a vertical signal pole B, of a height suitable to give the

light signal at a proper distance, and said pole is provided at a point near the top thereof with the vertical slot C, which receives the guide and supporting pin D, of the U-shaped lens frame E. The pin D, passes through both arms of the lens frame E and the slot in said pole, so as to provide for a vertical sliding movement of said lens frame. The lens frame E, embraces opposite sides of the pole B, and has the two arms thereof project in front of the track side of said pole, said arms carrying in their extremities the colored lenses F, one of which is the usual danger color, so that when the light from the lamp is radiated therethrough, it will indicate danger or obstruction on the block. The extended arms of the lens frame E, are designed to work on opposite sides of the lamp G, which lamp is supported in a suitable socket H, on the rail side of said pole.

A lifting link I, is pivotally connected at its lower end to one end of the lens frame E and at its upper end to one end of the weighted lifting lever J. The weighted lifting lever J, is pivotally mounted at or about its center on one side of the pole B, on the pivot rod T and normally lifts the lens frame E, above the lamp, so as to carry the lenses out of line with the light from the lamp, so that, normally, the light signal will not be displayed. When the lens frame is set to give a signal, the same is drawn downward by means of the setting wire K, connected at one end to the frame, passing over a suitably arranged guide pulley k, at the base of the pole and connected at its other end to the outer end of the signal setting lever L.

The setting lever L, is pivotally mounted near the track in the block l, and is provided at its inner end with the upturned tread lug l', which lies inside of one of the rails of the track. Arranged over the tread lug of the lever L, is the tread or press spring M, the slotted ends m, of which, move on the pins m', in the ties, and the central bow portions of which normally project a distance above the rail, so that the wheel of the locomotive will depress the same and the inner end of the lever L, so as to raise the other end and draw on the cord K, to draw down the lens frame in a position in a line with the lamp.

From the drawings it will be clearly seen

that the pivot rod T, which carries or supports the weighted lifting lever J, is extended at the track side of the signal pole, and has attached to such extended end the fan signal board U. The fan signal board U, is painted the usual designating signal colors, so that when it is turned in a proper position, it signals danger from one side and a clear track from the other. As the lens frame E, is normally lifted by reason of the weighted lifting lever, out of alignment with the lamp, the fan signal board U, is disposed in a horizontal plane so as not to display any signal whatever, but when the lens frame is drawn down by reason of the connections just described, the fan signal board is simultaneously turned in a position to show its painted sides. The fan signal board is of course designed to give the proper day signals from the same operating mechanism which renders the movable lens frame useful as a night signal, and in the description which follows it will be borne in mind that the day and night signals are simultaneously operated, so that one is available for day use and the other at night.

Now it will be readily seen that a train entering a block, and not seeing the signal displayed, passes on until it reaches the setting lever, at which point the lens frame and fan board are set to display a signal in a manner just described, so that a succeeding train would be signaled, while the first train was still on the block as will be readily apparent. After the first train has left the block, the signal is automatically thrown off in a manner to be presently described.

In order to insure the signals being observed, I employ in connection therewith, an alarm device which I will now describe. Secured to the rail side of the pole B, directly under the lamp G, is the bell N, below which is designed to work the reciprocating hammer arm n. The said hammer arm n, moves through the guides n', secured to the pole B, and is pivotally connected at its lower end to the upper member of a knuckle joint O, the lower member of which is loosely connected to the outer end of the horizontal operating lever o. The horizontal operating lever o, is pivotally mounted in the block o', and is provided with an upturned tread lug o² arranged inside of one of the rails, and over which is placed a tread or press spring M, such as previously described. To both sides of the knuckle joint, or to the joint pin thereof are attached the yokes P, to one of which is connected the cord p, passing over a suitably arranged pulley p', and carrying a weight p², which normally breaks the joint, while to the other of said yokes is connected a setting wire Q, one end of which is attached to the setting lever L. Normally, the weight p², breaks the knuckle joint, so that a wheel depressing the lever o, will not raise the hammer sufficiently high to strike the bell. On the other hand when the passing train has set the lever L, the knuckle joint is straight-

ened out sufficiently, so that a train passing over the lever o, will cause the alarm to be struck.

Just before passing off of a block, the end of which is indicated by the pole Z, and just before passing over the setting lever of the next block indicated in full lines, the train passes over a throw-off lever R, similar in construction to the lever L and also having a press spring M, over the rail end thereof. The outer end of the throw-off lever has attached thereto the wire r, passing over a suitably arranged guide pulley r', and connected to the outer end of the setting lever L. When the track end of the throw-off lever is depressed and the outer end correspondingly elevated, the wire r, draws down the elevated end of the setting lever and causes the signals to resume their normal position so as to indicate that the block the train has left is safe.

In order to hold the levers L, and R, in their elevated and depressed positions, I employ the lever catches S. The lever catches S, comprise the opposite inwardly bent spring arms s, arranged in the boxes s'. The inwardly bent spring arms s, at a central point are in close proximity to each other, so that the levers in passing above and below such central point spread said spring arms apart, so as to allow the same to close over or under the levers, as the case may be, to hold the same steady in both of their positions.

Before a train leaves one block and reaches the throw-off lever thereof, it passes the signal pole of the next block which is shown in dotted lines in the drawings.

Now it is thought that the operation of the signaling apparatus will be apparent. When the lens frame or fan board day signal show no danger or when the alarm is not sounded by the train, the same runs by the signal post a suitable distance until it reaches the setting lever. The wheels of the locomotive now depress the setting lever and set the signals for any approaching train, so as to protect such train and also to protect the first train should it stop on the block. If the first train has no cause to stop, and the next signal post shows no danger, it passes on and runs over the throw-off lever, which causes the signals of the last block to resume inactive positions.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a railway signal, the combination of a suitably arranged signal pole, the stationary lamp arranged at one side of the pole, a vertically sliding lens frame embracing and working on the signal pole, a horizontally turning board signal mounted on the pole

above the lamp independent of the lens frame, a suitable connection between the board signal and the lens frame, and single operating mechanism for simultaneously controlling the board signal and lens frame, substantially as set forth.

2. In a railway block signal, the combination of alarm, light and board signals arranged adjacent to the track on a pole, a single setting lever pivoted adjacent to the track and controlled by a passing train, said lever being connected with the light and board signals, a throw-off lever arranged at the end of the block and connected with the setting lever, an operating lever for the alarm signal, and a suitable connection from the operating lever to the setting lever, substantially as set forth.

3. In a railway signaling apparatus, the combination of the signal pole, an automatically controlled alarm signal arranged on said pole, a similarly controlled combined light and board signal arranged on the pole, a horizontal setting lever arranged adjacent to the track and provided with an upturned end projecting in the path of the car wheels, signal setting wires connected to one arm of said lever and to the signals on said pole, a throw-off lever arranged at a distance from the setting lever and similarly controlled, and a wire connected to one end of said throw-off lever and to said setting lever, and a separate operating lever for the alarm signal substantially as set forth.

4. In a railway signaling apparatus, the combination of the signal pole having a vertical slot in its upper end, a lamp arranged on one side of said pole, a U-shaped lens frame embracing said pole and the arms of which are extended beyond the pole and provided with lenses arranged to align with the lamp, a guide and supporting pin connecting the arms of the lens frame and adapted to work in said vertical slot, a weighted lever pivotally mounted on the pole and connected with said lens frame to normally raise the same above the lamp, an automatically controlled setting lever connected with said lens frame to lower the same in a line with the lamp, and a similarly controlled throw-off le-

ver connected with said setting lever, substantially as set forth.

5. In a railway signaling apparatus, the combination with the signal devices, and the automatically controlled setting and throw-off levers for said signal devices; of the lever catches comprising boxes in which the levers move and opposite inwardly bent spring arms arranged in said boxes, said spring arms having their central portions lying in close proximity to each other so as to close over and under said levers in their elevated and depressed positions, substantially as set forth.

6. In a railway signaling apparatus, the combination with the slotted signaling pole carrying a lamp on one side; of a vertically movable U-shaped lens frame embracing and sliding on said pole, and means for automatically controlling said lens frame, substantially as set forth.

7. In a railway signaling apparatus, the combination with the signal pole, and the stationary lamp; of the movable lens frame arranged on said pole to operate in conjunction with the lamp; a turning pivot rod loosely mounted in said pole above the lamp and carrying at one end a weighted lever a link connected to the lever and to the lamp frame to normally elevate the latter, a fan-board day signal, carried on the other end of the rod and means for automatically controlling the lens frame to operate the same simultaneously with the turning fan signal, substantially as set forth.

8. In a trip device for railway signals, the lever catches comprising boxes in which the operating levers move, and opposite inwardly bent spring arms arranged in said boxes, said spring arms having their central portions lying in close proximity to each other so as to close over and under said levers in their elevated and depressed positions, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK W. KLINE.

Witnesses:

S. W. LASHER,

F. D. KLINE.