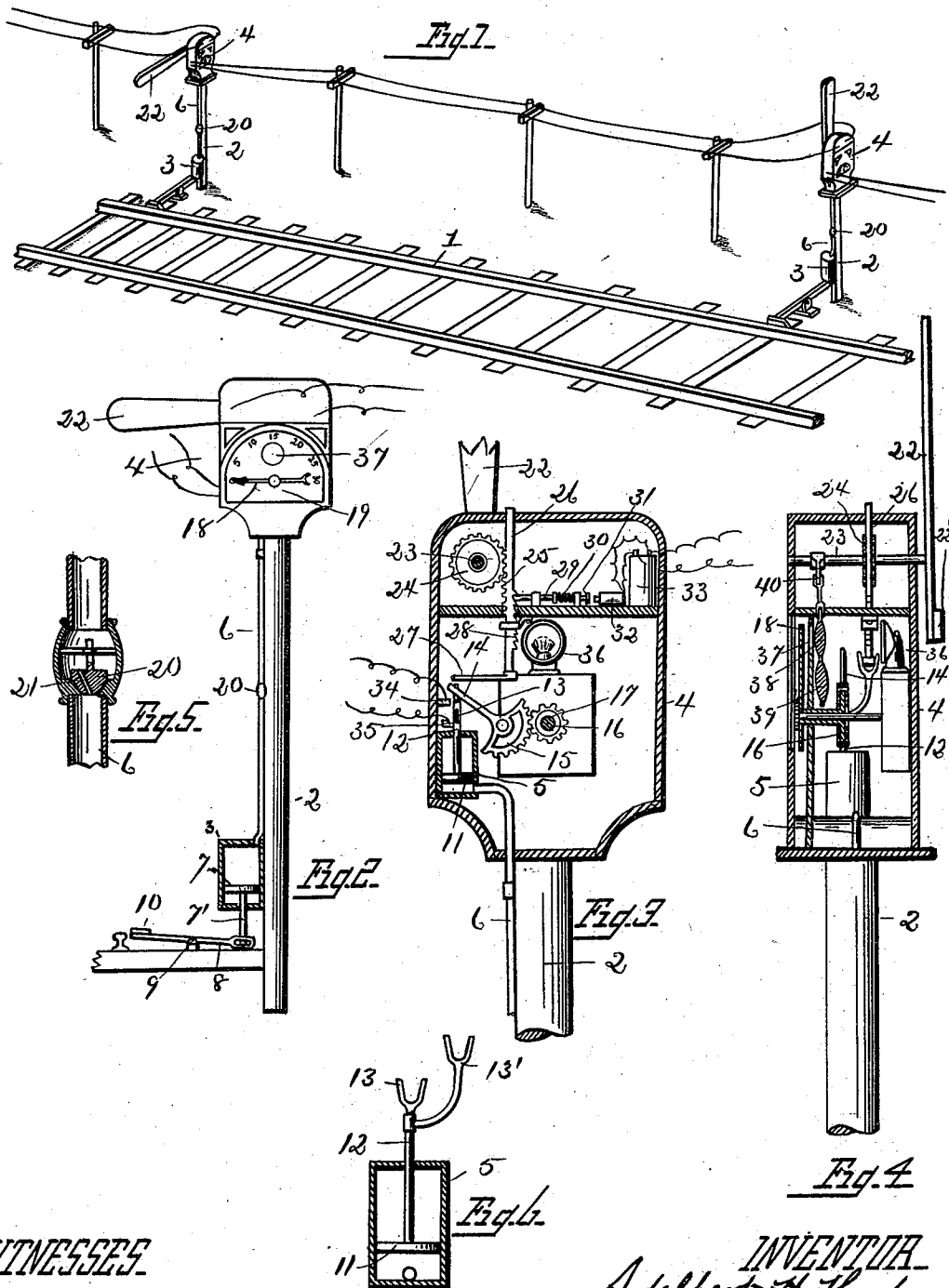


(No Model.)

A. H. THORP.
RAILWAY TIME AND BLOCK SIGNAL.

No. 507,510.

Patented Oct. 24, 1893.



WITNESSES

Carroll J. Webster
Floyd R. Webster

INVENTOR
Adelbert H. Thorp
By William Webster
Atty

UNITED STATES PATENT OFFICE.

ADELBERT H. THORP, OF TOLEDO, OHIO.

RAILWAY TIME AND BLOCK SIGNAL.

SPECIFICATION forming part of Letters Patent No. 507,510, dated October 24, 1893.

Application filed February 7, 1893. Serial No. 461,342. (No model.)

To all whom it may concern:

Be it known that I, ADELBERT H. THORP, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Time-Blocks for Railways; and I 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, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to a time block for railways, and has for its object to provide a time block signal actuated to set the pointer of the time signal to zero, and the block signal to indicate a closed block and simultaneously by electrical connections indicate by the block signal at the entrance of the block vacated that the block is open.

A further object is to provide mechanism for resetting the pointer by contact of the first wheel of the train without being affected by those passing subsequently.

The invention consists in the parts and combination of parts hereinafter described and pointed out in the claims.

In the drawings: Figure 1 is an elevation of a block of track, with the system of time and block signals operatively applied. Fig. 2 is a front elevation of the same, part being in section to show the means employed to actuate the time signal, and electrically release the block signal to allow the same to rise. Fig. 3 is a sectional front elevation of the elevated casing, showing the mechanism contained therein for operating the time and block signals. Fig. 4 is a sectional side elevation of the same. Fig. 5 is a detail view of the check valve. Fig. 6 is a sectional detail view of the cylinder and piston rod, showing the arms for raising the signal and re-setting the signal.

1 designates the rails of the main track, by the side of which at certain distances apart are posts or standards 2, each of which are provided with an air cylinder 3, at or near the base, and a casing 4 at the top, there being an air cylinder 5 within the casing, which is connected with cylinder 3, by means of a pipe 6. Within the cylinder 3 is a piston 7, the stem 7' of which projects through the bot-

tom of the cylinder, and is pivotally connected with a lever 8 fulcrumed at 9, with the outer end 10 projecting in close proximity to one of the rails of the track, and adapted to be depressed by the wheel of the train when passing upon the rail, whereby the piston 7 is raised, causing a current of air to be forcibly injected into the cylinder 5 with the effect of raising a piston 11 therein, whose stem 12 projects through the top of the cylinder, and is provided with a stop 13, which contacts with the end of a lever 14 connected with the segmental gear 15, which meshes with a pinion 16 upon a hollow shaft 17, and connected with clock mechanism to actuate a pointer 18, to indicate the period of time upon a dial face 19 that has elapsed since the passage of a preceding train, as more fully described in Letters Patent No. 481,723, granted to me August 30, 1892. My present improvement over the invention therein described consists in providing means for checking the return of air in pipe 6 to cylinder 3, so that the piston therein shall return so slowly that only one wheel of a train shall contact with the end 10 of lever 8, and consists in providing valve 20 in pipe 6 by which means, when piston 7 rises, valve 20 rises and allows the air to pass through, when the valve drops into its seat and only allows the air to return, to cylinder 3, through a diminished orifice 21, whereby the piston lowers, and the end 10 of lever 8 rises so gradually that the entire train may pass before the lever is raised sufficiently to contact with the wheels.

22 designates a signal secured upon shaft 23 journaled in casing 4, and provided with a pinion 24, which meshes with a rack 25, upon a vertically movable standard 26, formed with a right angled foot 27, which extends in the path of travel of the end of an arm 13' of piston stem 12 by which means the standard is raised by said stem, when lever 10 is actuated to set the time signal, and signal 22 is lowered to a horizontal position, when upon the descent of stem 7' the standard may lower, and as signal 22 is counterbalanced as at 22', it may rise. In order, however, to prevent signal 22 from rising until a train has passed from the block, there is formed a ratchet face 28, upon standard 26, upon the side opposite to rack 25, with which a catch 29 engages, when

advanced, the catch being urged forward by means of a coiled spring 30 surrounding the same, or in any preferred manner, whereby the signal 22 is held horizontally until the catch is withdrawn, when the counterbalanced end 22' will cause the signal to assume a vertical position, which indicates that the block is clear. Catch 29 is withdrawn by means of the armature 31 of an electric magnet 32, the wires of which are connected with the respective poles of battery 33 and are connected at their opposite ends with a circuit closer, within the casing of the opposite block. The circuit closer comprises a contact point 34 upon the inside of the casing, and a movable contact point 35 upon stem 12, of piston 11, which when the piston is raised, closes the circuit and withdraws the catch 29, whereby signal 22 is raised.

In operation, a train entering a block, the front wheel contacts with the end 10 of lever 8, raises piston rod 7' and by means of conduit 6, raises piston rod 12 which resets hand 18 of the time signal to 0, and also raises standard 26 and by means of rack 25 lowers signal 22 and by the same operation closes the circuit of the block, and thereby retracts catch 29, raising the signal 22 at the opposite end of the block, giving warning to a succeeding train that the block is clear, (see Fig. 1,) this arrangement of the several parts being in effect until the train has left the block, with the exception that the time signal registers the time from the instant the train passes into the block, so that as a succeeding train enters the block the signal 22, indicates that the block is clear and the pointer designates upon the dial the exact time that has elapsed since the preceding train has passed.

By the foregoing it will be seen that if trains have orders to run say eight minutes apart, and the road employs five mile blocks, if the engineer on a train finds a block clear, as designated by the signal 22, by means of the time signal, he can easily tell at what point in the preceding block the preceding train is, and also how far apart in time the two trains are. If on entering a block the danger signal is down, but say seven minutes have elapsed by the time signal, the engineer can proceed slowly until the preceding signals indicate a clear block and the necessary eight minutes time between the two trains, when he can run at the regular speed. Thereby at all times the engineer can determine if he has a clear track for a given distance, and if not clear he can determine just how much time has elapsed, and can thereby keep in the prescribed time by checking the train without a full stop to receive orders, and the uncertainty now existing between stations.

In adapting the signal for use at night, there is a mechanical arrangement employed for displaying a red or white light, the red indicating danger, or that the succeeding

block is occupied, and white indicating a clear track.

36 designates a reflector lamp placed in the casing 4, reflecting light through opening 37 in the dial, there being white and red lenses 38 and 39 respectively, actuated by means of a lever 40 secured at one end upon shaft 23, and at the opposite end by means of flexible connections with the lenses.

In operation when lever 8 is moved by a passing train, and shaft 23 is turned, the outer end of lever 40 is raised, moving the lenses until the red lens 39 is in line with the reflector, and opening 37, thereby giving warning to a succeeding train that the block is occupied. After the train leaves the block, and by means of electrical connections, disengages catch 29 and allows lever 26 to fall, thereby revolving shaft 23 back to its original position, the lever 40 will lower the lenses and cause white lens 38 to be in line with the deflector and opening 37, thereby designating to a succeeding train that the block is clear. To intensify the current I preferably employ an induction coil of any desired form, which being only a matter of detail of construction, I have not described in detail.

What I claim is—

1. In a railway block signal, a casing clock mechanism thereon, a dial, a pointer actuated by the clock mechanism, an air piston arranged in said casing, a signal pivoted in the casing and provided with a counter weight, mechanical devices connected to the air piston for setting the signal and the pointer, a catch for holding the signal in place, and an electric circuit and connections for withdrawing said catch, whereby the signal will be caused to move upon its pivot by its counter weight.

2. In a railway block signal, the air cylinders, pistons, conduits and track lever, a counter balanced signal carrying a pinion on its shaft, a vertically moving setting rod operated by the piston of the upper air cylinder, a catch for holding the same set, and an electro magnet and circuit connections for withdrawing the said catch, whereby the signal is permitted to swing upon its pivot.

3. In a railway block signal, a track lever, upper and lower air cylinders, pistons, and a conduit, a casing containing a lamp, a signal properly counter balanced, and having a gear mounted upon its shaft, a rack bar meshing therewith, a catch holding said bar in place, and a set of signal lights connected also to the signal shaft and adapted to be moved in front of the lamp.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ADELBERT H. THORP.

Witnesses:

WILLIAM WEBSTER,
FLOYD R. WEBSTER.