

(No Model.)

2 Sheets—Sheet 1.

F. A. CHAPMAN.
AUTOMATIC SWITCH.

No. 507,352.

Patented Oct. 24, 1893.

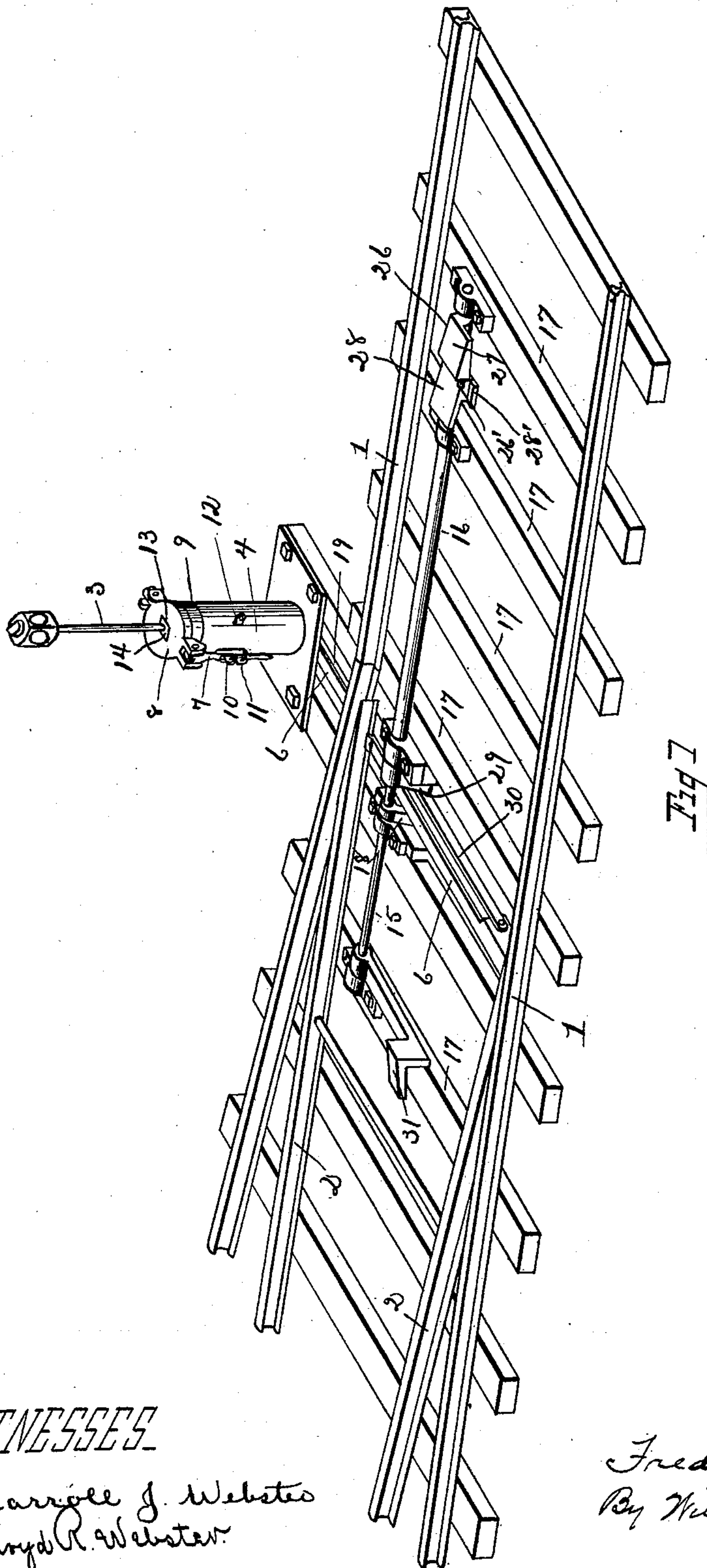


Fig. 1

WITNESSES

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Floyd R. Webster

INVENTOR

Fredrick A. Chapman
By William Webster
att.

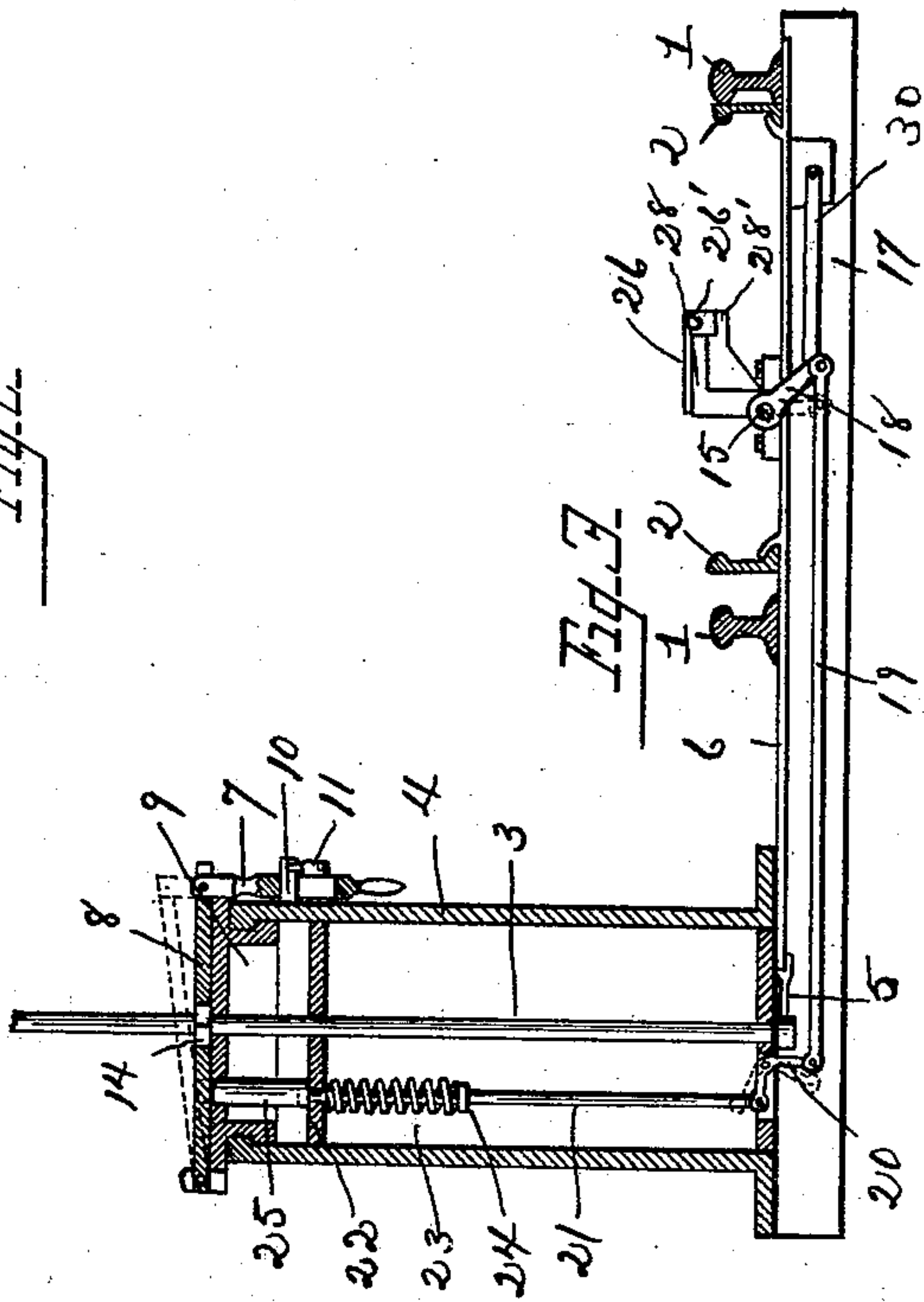
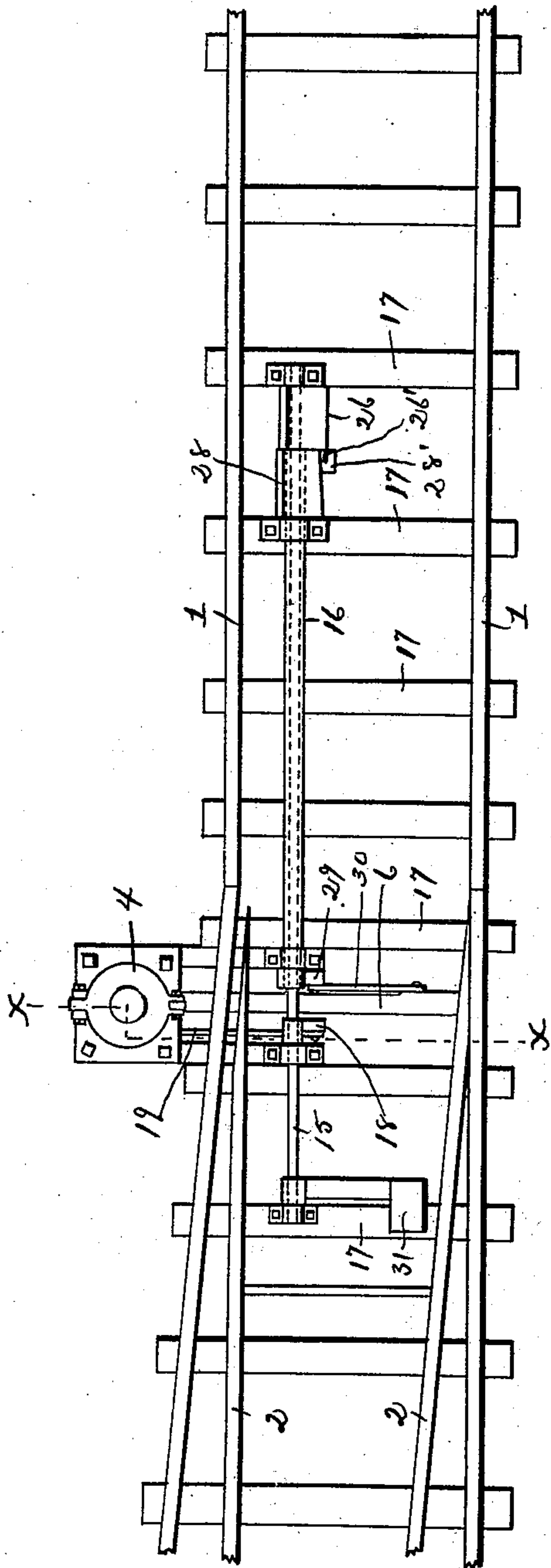
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INVENTOR

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UNITED STATES PATENT OFFICE.

FREDERICK A. CHAPMAN, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO CHRISTOPHER F. WALL AND LOUIS L. D. CHAPMAN, OF SAME PLACE.

AUTOMATIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 507,352, dated October 24, 1893.

Application filed March 31, 1893. Serial No. 468,438. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. CHAPMAN, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Automatic Switch-Closers; 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 an automatic switch closer, and has for its object to provide mechanism capable of connection with an ordinary switch stand or switch operating device, whereby an open switch may be closed at will by the engineer of an approaching engine.

A further object is to provide a switch closer in which an open switch may be locked in the ordinary manner, and closed automatically by the engineer of an approaching engine should he desire to continue upon the main track.

A further object is to provide a switch closer in which the switch may be operated in the usual manner and locked closed at the will of the engineer in approaching from either direction.

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

In the drawings: Figure 1 is a perspective view of a main track and switch rails, showing an ordinary switch stand with my automatic closer connected with the switch mechanism thereof. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section on lines X—X, Fig. 2.

It is a well known fact that a great proportion of the railway accidents of the present time is due to the carelessness of the employés, either the switchmen or trainmen, in leaving an open switch, and as the side tracks are used mostly by freight trains, it follows that carelessness in leaving a switch open results in most instances in leading a fast running train from the main track into collision with a side tracked train, as the speed of the fast train is too great to allow of checking to

any appreciable extent when the open switch is discovered. I have provided means readily attached to an ordinary switch whereby all danger of open switches is avoided by reason of an automatic closure of the same by means of a controllable trip upon the engine which may be operated when approaching a switch or left in operative position during the entire run.

1 designates the main track, and 2 the switch rails, the latter being operated by means of a vertical shaft 3 journaled within a switch stand 4, and having a crank 5 upon the lower end with which a bar 6 is connected, the bar being connected with the rails 2, 2 in the usual manner.

Shaft 3 is revolved manually to open the switch by means of a hand lever 7 pivotally connected with a locking plate 8, hinged upon an annulus 9, revolvably secured upon the upper end of the stand, whereby the locking plate and annulus may revolve freely upon the stand a distance to open or close the switch.

Hand lever 7 is formed with an elongated slot which co-incides with a catch 10 upon the stand, whereby the catch may enter the slot when the switch is open, and the lever 7 may be secured by means of a lock 11 which passes through a perforation in the catch, there being a like catch 12 arranged sufficiently low upon the stand to engage with the lower wall of the slot to prevent the possibility of vertical movement of the lever when in this position, and holding the locking plate firmly in position, the catch 10 being higher upon the stand to enter the slot of lever 7, at the upper end of the slot when the locking plate rests upon the top of the stand horizontally, and allow the locking plate to rise, when necessary.

Locking plate 8 is formed with a central rectangular opening 13, into which a rectangular block 14, secured upon shaft 3 enters to cause the plate to move with the rod rotatively when the parts are engaged, and as a consequence to lock the rod from rotation when the hand lever is locked to the stand, and the parts in engagement, which is the case when the switch is closed, as the relation of the slot and catch is such that the block is at all times

within the rectangular opening. When, however, the switch is open and locked by means of the hand lever engaging with the catch 10, it is necessary to provide for closing the switch for a train desiring to pass upon the main track. This is accomplished by means of a trip mechanism actuated by a trigger upon the engine and controllable by the engineer.

The trip mechanism comprises first a solid rod 15 journaled within a tubular rod 16, journaled upon the cross ties 17 of the track and parallel with the track. Rod 15 is provided with a crank arm 18, which is connected with a bar 19, which in turn is connected with a bell crank lever 20, the opposite end of the bell crank being connected with a vertical rod 21, the upper end of which enters a perforation in a diaphragm 22 arranged across the stand, and which guides the rod in its vertical reciprocation. Rod 21 is normally depressed by means of a coiled spring 23, which encircles the rod, and bears with the lower end upon a collar 24 thereon, the upper end of the spring bearing upon the diaphragm.

There is a pin 25 depending from the plate 8, which when the switch is open, co-incides with the rod 21, and which when rod 15 is revolved, raises the locking cap to allow the switch to be closed as the elevation of the plate removes the same from engagement with block 14 and allows the shaft 3 to revolve.

Rod 15 is revolved by reason of the depression of a trip bar 26 secured upon the outer end of the same, formed with an inclined face 27 with which a trigger upon the engine contacts, the depression of the blocks being rotative, communicating the same motion to the rod 15, which through the medium of bar 19, bell crank lever 20 and rod 21, contacting with pin 25, raises the plate.

The switch rails are moved to close the switch automatically by means of the hollow shaft 16, which is provided with a trip bar 28, similar to bar 26, and which is operated in a similar manner by the trigger upon the engine, and at the opposite end of the hollow shaft is a crank arm 29, connected with a bar 30, which is secured to bar 6, and moves the same when a trip bar 28 is depressed, thereby closing the switch.

Trip bar 26 is provided with a pin 26' which contacts with a lug 28' upon the trip bar 28, and depresses the bar slightly at the limit of movement, rotatively of bar 26, whereby shaft 3 is given a slight rotative movement to cause block 14 to be out of register with opening 13, so that as the trigger of the engine passes from trip bar 26, and the locking plate falls, the two will not co-incide until the shaft 3 is revolved sufficiently to close the switch on a one fourth turn, when the plate 8 will drop and lock the shaft.

The switch being locked in open relation to the main track, it is necessary to automatically release the same to allow a train coming from an opposite direction to close the switch. This is accomplished by extending

rod 15 upon the opposite side of the switch stand a short distance, and securing upon the end a trip bar 31 in co-incidence with the trigger upon the engine when reversed, whereby when the trip bar is depressed, the rod 15 is revolved, and the locking cap raised to allow the rod 3 to revolve as the switch is closed.

It will be seen that by my construction of switch stand and locking mechanism the switch is locked at all times, and by reason of the automatic tripping mechanism there is insured at all times the safety of a closed switch.

In adapting the safety switch closing mechanism to a switch of ordinary construction, the greatest modification required is the provision of a locking plate, and co-acting locking mechanism upon the shaft 3.

I have not deemed it necessary to illustrate my peculiar form of trip mechanism upon the engine, as it will be apparent that any form of controllable trigger will subserve the purpose, and that this trip mechanism and switch closer may be adapted equally as well to electric and cable cars and tramways. Hence the location and operation of the trigger will be of necessarily varied form to suit the various uses to which the switch closer is put.

What I claim is—

1. In combination, a switch stand and revoluble top having a polygonal opening, a switch shaft having a polygonal block to fit said opening in the top, said top being hinged and capable of a vertical movement, and mechanical connections for automatically raising said top so that the shaft can be turned independently of the said top.

2. In combination, the main and switch rails, switch shaft and connections, a locking cap for said shaft a rock shaft and tripping lever for releasing said cap, a rock shaft and tripping lever for operating the switch, said last named lever being operated by the first named tripping lever, whereby the lock is released prior to the movement of the switch.

3. In combination, the main and switch rails, a switch stand and shaft, a cap for locking the shaft, said cap being revoluble and capable of a vertical movement, a lifting rod for raising the cap, rock shaft, and tripping and bell crank levers for operating the lifting rod, whereby the switch can be unlocked from the locomotive.

4. In a switch closer, the main and switch rails, the switch shaft and bar connecting said shaft and switch rails, a locking cap for said shaft, a tubular shaft having a tripping lever, and a crank arm connected with the switch rail, a rock shaft journaled in the tubular shaft and provided with a trip lever, and a crank arm connected to the opposite end of the said shaft, a lifting rod for raising the locking plate, and means for connecting the crank arm and said rod.

5. A switch closer comprising two parallel shafts journaled in parallel relation with the

track, a locking mechanism for securing the switch in open or closed relation, connections with the locking mechanism and one of the shafts to release the lock, and connections
5 with the switch operating mechanism and the remaining shaft to close the switch when the lock is released, the two shafts having points of contact for a passing engine.

6. In a switch closer, in combination with
10 the switch points and tie bar, a vertical shaft, a crank upon the shaft connected with the tie bar, an irregular enlargement upon the shaft, a movable locking plate having an orifice to receive the enlargement and lock the
15 shaft from revolution, a shaft connected with the tie bar and having a trip plate adapted to be actuated by a passing engine, a parallel shaft having a trip plate and connections with the locking plate, whereby the movement of
20 the trip plate by a passing engine will release the locking plate, and allow the switch to close.

7. In a switch operating device, a switch stand having a revoluble portion, a plate hinged thereon having a rectangular orifice, 25 a handle hinged upon the plate, a vertical shaft extending through the plate having a rectangular enlargement to enter the orifice and lock the shaft from revolution upon each one fourth turn of the shaft, a crank arm 30 upon the shaft connected with the switch rails, a trip plate, a shaft connected therewith and with the switch rails, a shaft connected with a trip plate and having an arm within the switch stand, connections with the arm 35 and rod to raise the plate when the trip plate is depressed.

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

FREDERICK A. CHAPMAN.

Witnesses:

WILLIAM WEBSTER,
FLOYD R. WEBSTER.