F. M. OEDER.

AUTOMATIC SWITCH MECHANISM.

APPLICATION FILED APR. 11, 1908.

924,687.

Patented June 15, 1909.

2 SHEETS—SHEET 1.

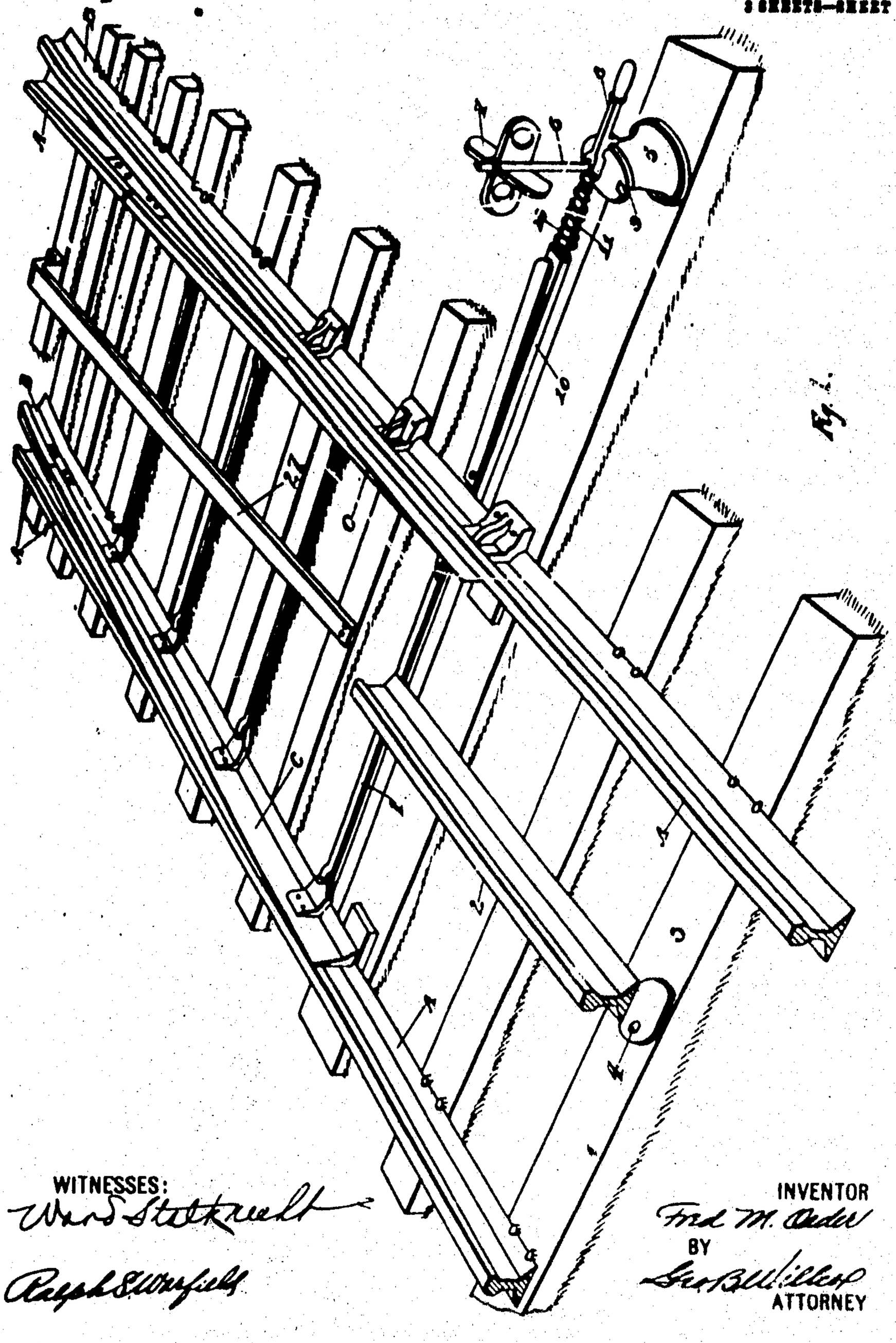

Fig. 1.

WITNESSES:

Wm. S. Stockwell

Ralph S. Mansfield

INVENTOR

Fred M. Oeder

BY

Geo. B. Willcox

ATTORNEY

F. M. OEDER.

AUTOMATIC SWITCH MECHANISM.

APPLICATION FILED APR. 11, 1908.

924,687.

Patented June 15, 1909.

3 SHEETS—SHEET 2.

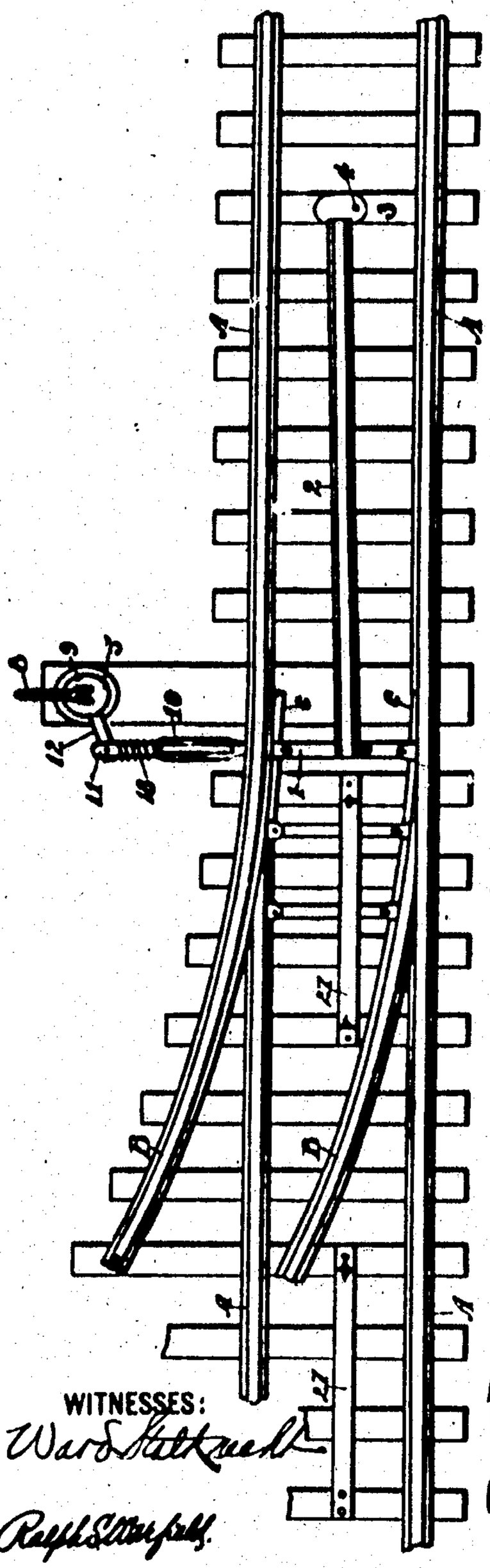

Fig. 2.

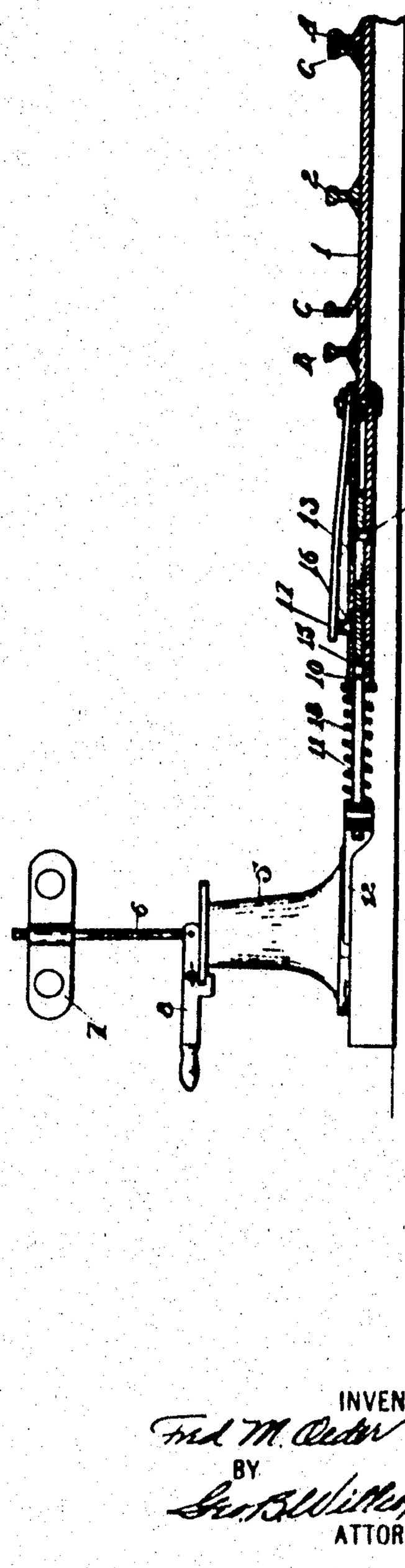

Fig. 4.

WITNESSES:

Ward Stillwell

Ralph Stanley

INVENTOR

Fred M. Oeder

BY

Geo. B. Wilkinson

ATTORNEY

F. M. OEDER.

AUTOMATIC SWITCH MECHANISM.

APPLICATION FILED APR. 11, 1908.

924,687.

Patented June 15, 1909.

3 SHEETS—SHEET 3.

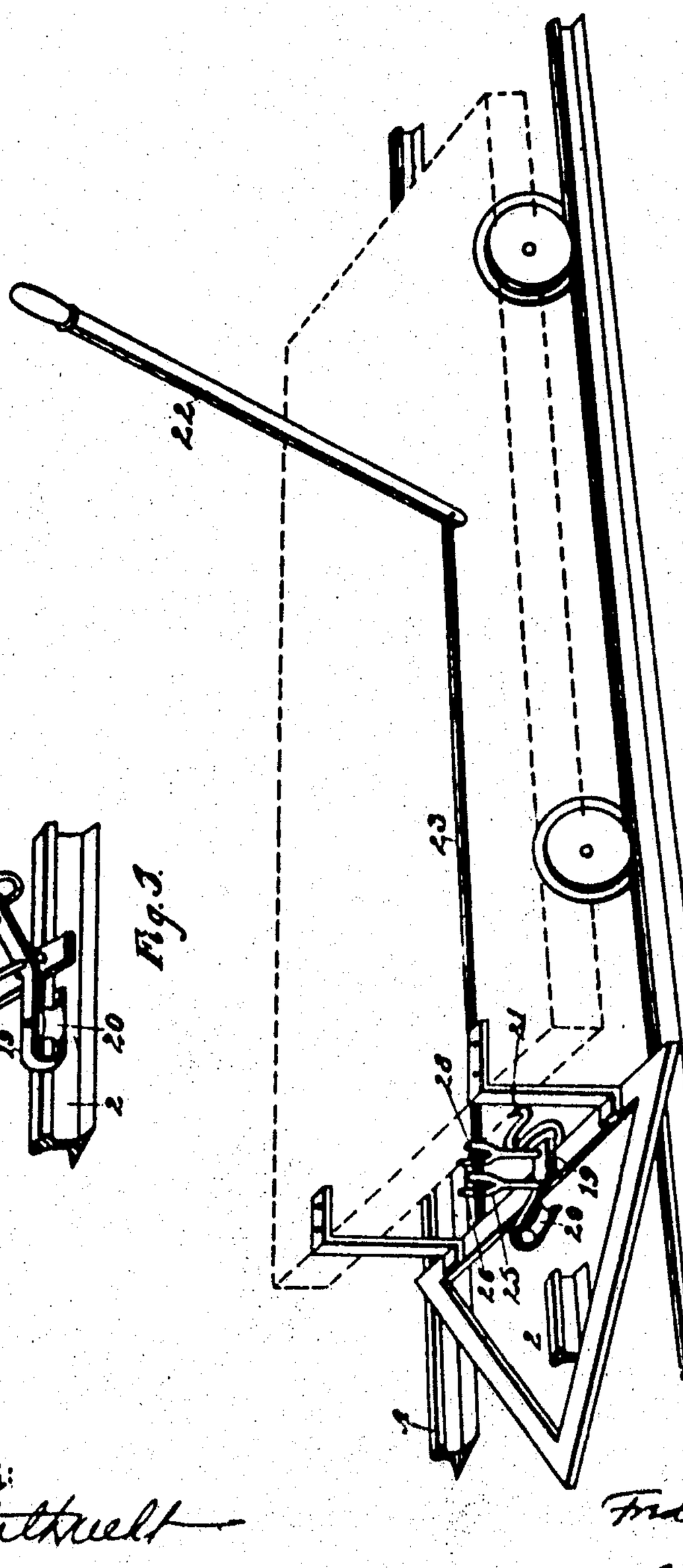

Fig. 3.

Fig. 4.

WITNESSES:

Ward & Stallknecht

Ralph S. Barfield

INVENTOR

Fred M. Oeder

BY

Geo. B. Willcox

ATTORNEY

UNITED STATES PATENT OFFICE.

FRED M. ORDER, OF BAY CITY, MICHIGAN.

AUTOMATIC SWITCH MECHANISM.

No. 924,687. Specification of Letters Patent. Patented June 15, 1909.

Application filed April 11, 1908. Serial No. 426,611.

To all whom it may concern:

Be it known that I, FRED M. ORDER, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Automatic Switch Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to automatic switches for railways.

One object of my invention is to provide means for preventing collisions between a train on a siding and a train following in the same direction when the brakeman of the train on the siding forgets to throw the switch to leave the main track clear.

Another object is to provide a switch with mechanism engaged and operated by a car device actuated by the engineer.

A further object is to provide means for locking the first train on the siding after the switch has been thrown by the following train to clear the main track.

A still further object is to provide means for automatically resetting the car device after the switch has been thrown.

A further object is the provision of means for permitting the engineer to throw the car device into operative position.

Another object is the provision of means for disengaging the car device from its operating means until the car device has been reset.

Still another object is to provide a switch capable of automatically yielding to permit the passage of a train traveling on the main track in a direction opposite to the switch.

Another object is the provision of means for automatically throwing a pivotally supported car device to either limit of its movement when it has passed dead center.

To these and other ends my invention consists in certain novel details and combinations such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view showing one form of the track device applied to a switch, Fig. 2 is a top plan view of the same, Fig. 3 is a perspective view of one form of car device, Fig. 4 is a detail view showing the switch bar construction and Fig. 5 is a detail of the contact member in operative position.

As is well known, the fault of many collisions at switching points on railways lies with the brakeman operating the switch. A freight or other train is ordered side-tracked or is switched off the main line and the brakeman forgets to close the switch to leave the main track clear. Another train following the first takes the switch instead of remaining on the main track and crashes into the rear end of the first train or collides head on with a train coming in the opposite direction on the side track, because the engineer of the second train does nor have time to apply his brakes before taking the switch.

It is the main object of my invention to provide means whereby such disasters may be avoided, to which end I have devised the following construction as one for accomplishing this purpose.

Referring to the drawings A, A, indicate the main track and B, B, the spur or side track.

C, C, indicate the movable switch tongues connected by a switch bar (1), in the usual manner. The switch bar is connected to the switch stand.

In accomplishing the end desired, my intention is to equip the pilot of an engine with a contact member of any suitable form adapted to engage a suitable track member connected to the switch bar in such manner that the travel of the engine will cause the contact member to bear against the track member and through such track member, close the switch to give a clear passage over the main line. As one such track member I may provide what I will call a glance rail, (2), which is located preferably between the rails of the main track. The glance rail may be of the usual T-rail construction, that end of the glance rail farthest from the free ends of the switch tongues being secured to one of the ties (3) either rigidly or pivotally as shown at (4). The opposite end of the glance rail is secured to the switch bar (1). It is obvious that there must either be a thrust movement of the contact member relative to the engine to move the track member and thus close the switch or else the contact member may be stationary as regards lateral movement which will make it necessary to arrange the track member at an angle to the path of travel of the contact member.

In the present construction I have shown the track member extending obliquely relative to the path of travel of the contact

member. Hence when the contact member is thrown into operative position it will engage the track member and force the latter together with the switch tongues laterally to close the switch. My invention however contemplates further developments. It is common to connect a rigid switch bar to a switch stand comprising a casing (5), in which is journaled a semaphore shaft (6) carrying a signal (7). The shaft (6) is rotated by means of a lever (8) locked in any suitable manner. In the present instance I have shown such lever (8) as being pivotally connected to the shaft and receivable in recesses (9) in the casing to lock the switch in open or closed position. It is obvious that if a switch is provided with such bar and locking means, it would be impossible to throw the switch by the engagement of the contact and track members as shown. I therefore provide a yielding connection extending between the switch tongues and semaphore shaft, such connection permitting the switch to be locked in either of its positions and yet allowing the switch to be thrown from open to closed position by a train on the main track when approaching the open switch. It also permits a train approaching an open switch, on the main line, from the opposite direction to spring the switch tongues over as it passes, the switch tongues returning to open position after the train has passed. As one such yielding connection I may provide the switch bar (1) with a socket (10) adapted to telescopically receive a rod, (11), the outer end of which is connected to a crank (12) on the semaphore shaft. That end of the rod received in the socket (10) is slotted as at (13). A pin (14) removably held in the socket extends through the slot in the rod to permit the switch tongues to be temporarily thrown over by a train on the main line approaching the open switch from the opposite direction, the pin operating to permit a relative movement of the switch bar and rod while retaining them against disconnection. As one means for automatically locking the rod and bar in telescoped position I may use the following construction: The socket may be provided with an aperture (15) adapted to register with a hole (16) in the rod so that a spring pressed stud (17) carried by the socket may drop into the registering hole and aperture to lock the switch rigidly in closed position, and prevent the exit of a train on the side track. A heavy coiled spring (18) encircles the rod, one end of the spring bearing against the end of the socket and the other end of the spring bearing against the rod. This spring normally tends to hold the pin (14) at the inner end of the slot and such spring is strong enough to overcome the weight of the switch tongues and connected parts and the friction caused in moving the switch from one position to the other. Hence it will be seen that ordinarily the tension of the spring in effect converts the sectional telescopic switch bar into a rigid one piece bar which is swung back and forth by the lever in the usual operation of opening and closing the switch.

We will now assume that a train has passed onto the spur or side track B, B, and that the brakeman has left the switch open. The engineer of a train following the first train will see from the signal that the switch is open, but he may be too close to the switch and traveling at too rapid a rate to apply the brakes and prevent his train from taking the side track. The contact member on the pilot of the second train however, will engage the track member connected to the switch tongues and force the track member over to close the switch and permit the second train to continue on the main line. The operation of this part of my invention is as follows. The switch is in the position shown in Fig. 2. The contact member under the pilot is thrown by the engineer and engages the obliquely extending guard rail to throw it together with the switch tongues, toward the switch stand to close the switch. This causes the socket (10), and its pin (14) to move relative to the rigidly locked rod (11) and against the tension of the spring (18) compressing the latter. The pin (14) travels toward the outer end of the slot (13), the slot being preferably slightly longer than the path of movement of the switch tongues. The spring pressed stud (17) carried by the socket rides upon the surface of the rod until its aperture (15) registers with the hole (16) in the rod whereupon the pin snaps into the hole (16) and absolutely locks the switch in closed position so that not even a movement of the lever 8 can throw the switch back to open position. The slot (13) and hole (16) are covered by the socket at all times. The locking of the switch tongues in closed position results for the following reason. The bar and rod together form a telescopic switch bar held in their extended positions by the spring (18). When the brakeman sets the switch in open position to allow the first train to take the side track he moves the lever (8) to one limit of its movement and locks it, the telescopic switch bar being in extended position. When the second train moves the switch tongues to closed position (the lever remaining locked in open position) the telescopic switch bar is contracted or shortened against the tension of spring (18) and is held in such position by the stud (17). In order to return the switch now closed, to open position, it would be necessary to move the lever farther in the direction in which it was first swung by the brakeman. Such farther movement of the lever is impossible and hence the switch remains locked in closed

ition until released in a manner hereinr referred to. When released, the tenn of the spring at once asserts itself and l either automatically return the switch open position or will rotate the semaore shaft, to closed position providing the ft operating lever is unlocked. The lock- of the switch in closed position operates prevent a train on the side track from reering the main line and I may so inclose switch bar and rod that no access may had thereto without a special key for innce. This arrangement would necessie notifying an official and result in the ection of the careless brakeman. In e this construction is considered to be practicable because of disarranging the in schedule, I may arrange the construcas shown so that the brakeman by the of a crow bar or other suitable tool may the spring pressed locking stud (17) out the hole (16) of the bar whereupon the ing (18) will either automatically force socket (10) and switch tongues to open ition or will rotate the semaphore shaft losed position.

he switch and track mechanism is operl by a contact member of any convenient n carried by the second train. I will now ribe one of a number of constructions of tact members which might be used. ably located on the engine and prefer- on the pilot I mount a shoe adapted to tact with the glance rail. The glance rail ht be located outside the main track. In present application I have illustrated a tact member comprising a bent or angupivotally supported plate (19) the free of which normally projects upward at ngle and carries an antifriction roll (20). pring (21) engages the rear end of the e, its function being to automatically w the plate to one or the other of its exe positions after the plate has passed its l center in one direction or the other. n the contact member is in its raised tion it will not engage the track member, track rails or other obstructions. In orto permit the engineer to throw the conmember into operative position I may ide lever (22) to which one end of a link is connected, the opposite end of the being loosely connected to the plate (19). his means the engineer on approaching pen switch, can move his lever to throw contact member down where it will enthe track member and close the switch. obvious, however, that if a train is eling at high speed, the engineer will not ble to return the contact member to d position between the time when the act member leaves the track member the time it reaches the switch rails. efore I provide a resetting member, one element of which consists of a rail (27) inclined upwardly in the direction of travel of the engine. This rail extends in alinement with the path of travel of the contact member its lower end lying adjacent the end of the track member. As the contact member leaves the track member, it engages the inclined resetting rail (27) and is thereby thrown past its dead center whereupon the spring (21) will raise the contact member to its upwardly inclined position. I may also provide a similar resetting member on the opposite side of the switch to reset a contact member which may have been thrown down by an engineer approaching the switch from the opposite direction (shown by arrow x). It is of course unnecessary for the engineer to throw the contact member into operative position even though the switch is open, first, because there is no track member to be operated and secondly, if the contact member remained in its lowered position it would engage and damage the inner switch rail, B, as well as itself. Thirdly, when the switch is open, the telescopic switch bar is always in extended position even though the lever (8) may be locked. As the train traveling in the direction indicated by the arrow x approaches the switch tongues, the flanges of the wheels will crowd the switch tongues over to closed position forcing the socket (10) on to the rod (11) the pin (14) moving in its slot (13) against the tension of spring (18) until the pin 17 registers with the hole 15, whereupon the pin will enter the hole and lock the switch in closed position.

The interval of time between the throwing of the contact member into operative position and its return to raised position is extremely short especially when the train is running at a high rate of speed. Naturally, if there is a positive connection between the lever (22) and the contact member, the engineer will hardly have time to release the lever before it is thrown back by the resetting of the contact member. It might happen that the engineer might get in the way of the lever or might not release it in time and the back lash of the lever would inflict great injury, to avoid which I provide a loose connection between the lever and the contact member which will permit the contact member to be thrown down into operative position by the engineer, but will not permit the resetting of the contact member from the cab. As one such means I may provide the forward end of the link with an aperture (24) adapted to seat upon a pin (25) located between the arms of a yoke (26) carried by the plate (19) intermediate its ends. The link is received and guided between the arms of the yoke (26) and of a second unseating yoke (28) projecting upward from the rear end of the plate (19). The forward end of the link may be inherently resilient so that the aperture is normally held in place on the pin. When

the engineer throws the lever (22) to move the contact member into operative position the rear end of the angular plate rises as the forward end is depressed. The yoke (28) rises with the rear end of the plate and unseats the link relative to the pin, so that the resetting of the contact member will not alter the position of the link and lever. After the contact member is reset by the rail (27), the engineer will then move his lever to draw the link backward and when the aperture (24) in the link registers with the pin (25), the inherent resilience of the link will cause it to seat over the pin thus restoring the engineer's control of the contact member.

It is evident that changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention. Hence, I do not wish to limit myself to the exact construction herein set forth.

Having thus fully disclosed my invention, what I claim as new is:—

1. An automatic switch mechanism comprising a switch, a pivoted laterally movable track member connected thereto, a traveling contact member normally out of operative position and combined manually actuated, and automatic means for moving the contact member into operative position to engage the track member and actuate the switch.

2. An automatic switch mechanism comprising a switch, a track member connected thereto, a traveling contact member consisting of a pivotally mounted support, a roll carried by the support, a lever, a connecting link, and a loose connection between the link and support for tilting the support to throw the roll into operative position.

3. An automatic switch mechanism comprising a switch, a track member connected thereto, a pivotally mounted traveling contact member adapted to engage the track member to throw the switch, a resetting member adapted to be engaged by the contact member to replace the same, and means loosely connected with the contact member for throwing the latter into operative position.

4. An automatic switch mechanism comprising a switch, a track member connected thereto, a traveling contact member, the contact member consisting of a pivotally mounted support, a roll on the support, a yoke carried by the support, a pin projecting between the arms of the yoke, a link received and guided between the arms of the yoke, the link having an aperture normally seating upon the pin, a lever controlling the link and means for automatically unseating the link as the support is thrown into operative position to engage the track member.

5. An automatic switch mechanism comprising a switch, a track member connected thereto, a traveling contact member, the contact member consisting of a pivotally mounted support, a roll on the support, a yoke carried by the support, a pin projecting between the arms of the yoke, a link received and guided between the arms of the yoke, the link having an aperture normally seating upon the pin, a lever controlling the link and a second yoke carried by the rear end of the support for lifting the link off the pin as the support is thrown into operative position by the lever.

6. An automatic switch mechanism comprising a switch, a track member connected thereto, a movably supported traveling contact member, means for throwing the contact member into operative position to engage the track member, and means for automatically moving the contact member to one or the other of its extreme positions after it has passed its dead center.

7. A switch mechanism comprising a switch, a sectional telescopic switch bar, means connecting the sections to permit a limited movement only of one section relative to the other yielding means for normally maintaining the switch bar in extended position, a switch lever for throwing the switch in either direction when the bar is in extended position, a track member connected with the switch, a traveling contact member adapted to engage the track member to crowd the switch over to one of its positions and telescope the switch bar against the tension of the yielding means and locking means for automatically retaining the switch bar in telescoped position when actuated by a passing train.

8. An automatic switch mechanism comprising a switch, a sectional switch bar, one of the sections sliding relative to the other, yielding means adapted to overcome the inertia of the switch for normally retaining the sliding section at one limit of its movement and the switch bar extended, a switch lever for opening and closing the switch while the switch bar is in extended position only, a track member connected to the sliding section of the switch bar, and a traveling contact member adapted to engage the track member when the switch is open to move the sliding section of the switch bar relative to the remaining section and close the switch.

9. An automatic switch mechanism comprising a switch, a switch bar having a socket on one end, a track member connected to the switch bar, a rod received in the socket, the rod having a slot near its inner end and a hole intermediate its ends, a pin extending across the socket through the slot, a spring pressed stud received in an aperture in the socket, a switch stand to which the outer end of the rod is connected, a spring, the opposite ends of which engage the socket and rod respectively, and a traveling contact mem-

ber adapted to engage the track member to force the socket along the rod against the tension of the spring until the spring pressed stud registers with the hole in the rod to lock the switch in closed position.

10. An automatic switch mechanism comprising a switch, a switch bar, a socket on the switch bar, a rod received in the socket, means for loosely connecting the socket and rod to permit a relative movement of the rod and bar, means for normally retaining the socket and rod at their extreme opposite limits of movement, means for reciprocating the rod and bar to open and close the switch, a traveling contact member adapted to engage the track member when the switch is open to move the socket relative to the rod, and means for locking the socket and rod together in their telescoped position to prevent a subsequent movement of the switch to open position.

11. An automatic switch mechanism comprising a switch, a switch bar, a track member connected to the switch bar, a rod so connected to the switch bar as to permit relative movement of the bar, a spring normally retaining the rod and bar at extreme opposite limits of movement, means having a limited movement normally adapted to reciprocate the rod and bar to open and close the switch, a traveling contact member adapted to engage the track member when the switch is open to close the switch against the tension of the spring, and means for locking the switch bar to the rod in their telescoped position to prevent the subsequent opening of the switch.

12. An automatic switch mechanism comprising a switch, a track member connected thereto, a movably supported traveling contact member, means normally retaining the member in inoperative position and means operated by the engineer for throwing the contact member into operative position and simultaneously removing it from the engineer's control.

13. An automatic switch mechanism comprising a switch, a track member connected thereto, a movably supported traveling contact member, means normally retaining the member in inoperative position, and means operated by the engineer for throwing the contact member into operative position and simultaneously removing it from the engineer's control, and means engaged by the contact member for replacing it under the engineer's control.

14. A switch mechanism comprising a switch, a switch lever, a sectional bar connecting the switch and lever, one of the sections being connected to and capable of a limited movement only relative to the other to permit movement of the switch relative to the lever when the latter is in one position, a spring normally tending to maintain the sections in extended position and overcome the inertia of the switch, a track member connected with the switch, and a traveling contact member adapted to engage the track member and crowd the switch over against the tension of the spring.

In testimony whereof, I have affixed my signature in presence of two witnesses.

FRED M. OEDER.

Witnesses:
J. RAY ABBEY,
RALPH S. WARFIELD.