

950,468.

Witnesses: 
Clarence Pridus
Florence Hammel

Inventor
Frank C. Anderson
By James A. Ramsey
Attorney

UNITED STATES PATENT OFFICE.

FRANK C. ANDERSON, OF CINCINNATI, OHIO, ASSIGNOR TO AMERICAN VALVE & METER COMPANY, OF CINCINNATI, OHIO. A CORPORATION OF WEST VIRGINIA.

COMPOUND DOUBLE AUTOMATIC LATCH.

950,468.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK C. ANDERSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Compound Double Automatic Latches, of which the following is a specification.

My invention relates to double automatic latches which are especially adapted to secure switch operating levers.

The object of my invention is to provide a latch which will secure the operating lever of the switch operating mechanism against movement when trains are passing over the switch and permit the switch operating mechanism to operate automatically under force caused by the train running through the switch without any damage to the operating mechanism, but which will also not offer any obstruction to the entrance of the operating lever of the switch into the latch when the switch is thrown.

My invention consists in a stand having a yoke adapted to receive the throwing lever, a main latch pivoted in the stand and an auxiliary latch pivoted on the main latch yieldable to allow the throwing lever to enter the yoke but rigid with respect to the main latch whereby the main latch may oppose the raising of the lever out of the yoke, said main latch being so mounted as to prevent the throwing lever from rising when trains pass over the switch, but to release the lever and allow it to rise when a train runs through the switch.

My invention also consists in the parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawings: Figure 1 is a side elevation of a latch embodying my invention, the throwing lever being shown in cross section. Fig. 2 is an elevation of the side of the latch opposite from that shown in Fig. 1, the auxiliary latch in yielding position being illustrated by dotted lines, and the throwing lever being shown in section. Fig. 3 is a plan view of the auxiliary latch. Fig. 4 is a side elevation of the same. Fig. 5 is an elevation of the auxiliary latch on the side opposite from that illustrated in Fig. 4. Figs. 6 and 7 are front and rear elevations, respectively, of the auxiliary latch. Fig. 8

is a side elevation of the main latch. Fig. 9 is a partial elevation of the side of the main latch opposite from that illustrated in Fig. 8. Fig. 10 is a rear elevation of the main latch.

My compound double automatic latch is preferably constructed as follows: The latch comprises a stand 1 having a suitable base 2 which is provided with slots 3, whereby it is secured to the cross ties of the track, not herein shown, and is provided with a slot 4, whereby it comprises a yoke adapted to receive and support the throwing lever of the switch. It is also provided with a slot in its forward upper part, extending transversely to the direction of the slot 4, whereby the forward upper part of the stand is bifurcated and comprises the two members 5 and 6. In this slot, between the members 5 and 6, the main latch 7 is pivotally mounted on a pin 8 extending transversely through the stand. The stand is provided with a housing 9 for the spring 10 and plunger 11, this housing being secured to the base by means of bolts 12. The main latch 7 has a treadle 13 extending forwardly with its lower side bearing against the upper end of the plunger 11 and the parts are so proportioned that the spring 10 within the housing 9, forcing the plunger 11 upward, tends to raise the treadle 13 and force the upper end of the main latch 7 forward toward the slot 4 in the stand. This forward movement of the upper part of the main latch is limited by means of lugs 14 on the main latch, near the origin of its treadle 13, and adapted to bear against the forward sides of the members 5 and 6 of the stand. This main latch 7 is of sufficient width to move freely in the slot between the members 5 and 6, but is provided with a recess 15 in one side of its upper part, in which is located a lug 16, preferably integral with the main latch. An auxiliary latch 17, of the proper shape and thickness to lie within the recess 15 when the main latch is in the slot between the members 5 and 6 of the stand, is provided with an opening which receives the lug 16 on the main latch and by which said auxiliary latch 17 is pivotally mounted on the main latch 7. The auxiliary latch 17 has an extension 17^a which projects rearwardly into the slot 4 in the stand when the main latch 7 is held with its lugs 14 against

the members 5 and 6 of the stand, and this projection 17^a of the auxiliary latch 17 forms the means for engagement with the throwing lever of the switch, whereby the movement of said throwing lever may be controlled by the latch. The lower side of this extension 17^a is substantially horizontal, or at right angles to the line of movement of the throwing lever when it is being raised out of the yoke of the stand, but the upper side of the extension 17^a is inclined in such moderate degree that, when the throwing lever is descending into the yoke of the stand, the extension 17^a, and consequently the auxiliary latch 17, with which it is integral, will be forced forwardly and upwardly, turning on the pivotal lug 16 on the main latch 7, the auxiliary latch 17 and the recess 15 being so shaped with respect to each other this this forward and upward turning movement is permitted. However, these parts are also so shaped relatively to each other, that rearward and downward turning movement of the auxiliary latch from its normal position will be prevented. Thus, the auxiliary latch 17 will yield to permit the throwing lever of the switch to enter the yoke without the necessity of the movement of the main latch 7 in opposition to the pressure of the spring 10. The auxiliary latch 17 is provided with a weight 18 on its rearward lower part, formed integral therewith and to the rear of the member 5 of the stand, in order that the auxiliary latch 17 may be returned to its normal position readily by the action of gravity, after the upper side of the throwing lever has passed below the lower side of the extension 17^a. Then, it will be noted, the raising of the throwing lever will be opposed by the engagement of the substantially horizontal lower surface of the extension 17^a with the upper side of the throwing lever, and, the rearward and downward movement of the auxiliary latch 17 with respect to the main latch 7 being prevented, due to the relative shapes of the recess 15 and the auxiliary latch 17, as hereinbefore stated, any motion imparted to the extension 17^a of the auxiliary latch 17 must also be imparted to the main latch 7, in opposition to the pressure of the spring 10. Thus, it will be seen that the seating of the throwing lever in the yoke of the stand is opposed only by the comparatively small resistance afforded by the action of gravity on the auxiliary latch 17 and its weight 18, but the raising of the throwing lever from the yoke, after it has been seated, is opposed by the much greater resistance afforded by the pressure of the spring 10 on the treadle 13 of the main latch 7, through the plunger 11 bearing on the lower surface of the treadle 13.

The spring 10 is made of sufficient strength to exert such a pressure against

the forward movement of the main latch 7 as will prevent such forward movement by the upward pressure of the throwing lever on the extension 17^a of the auxiliary latch 17, when such pressure on the throwing lever is due to the mere passing of trains over the switch. Thus, accidental operation of the switch due to the jolting which it receives when the train is passing over it is prevented. However, if the train runs through the switch from the opposite direction than that from which it is adapted to pass over the switch, the increased force thus brought to bear on the throwing lever of the switch will cause the main latch 7 to be forced forward, against the pressure of the spring 10, by the engagement of the upper surface of the throwing lever with the lower surface of the extension 17^a of the auxiliary latch 17, regardless of the fact that this lower surface of the extension extends substantially horizontally and at right angles to the line of movement of the throwing lever when it rises.

It will be understood that the raising of the throwing lever in such a manner requires a very great force in proportion to the force acting when the train passes over the switch, but it will also be understood that the force acting when the train passes through the switch is of such magnitude that it bears this proportion to the force acting when the train passes over the switch. Thus, an automatically operating switch stand is provided with means which permits the switch to be operated automatically when it is run through, without any damage to the operating mechanism. On the other hand, the switch will be perfectly rigid against operation when trains are passing over the switch. My present improvement, therefore, takes the place of automatic switch operating mechanism in the same manner as does my simple double automatic latch which forms the subject matter of Letters Patent No. 815,136. However, in addition to the advantage afforded by the simple double automatic latch, the ready yielding of the auxiliary latch 17 to the pressure of the throwing lever, when it is entering the yoke, precludes the possibility of the downward movement of the throwing lever being obstructed, and causing said throwing lever to rest on the upper side of the extension of the latch, as is sometimes the case where such extension is formed integral with the latch proper, and the forcing of the entire latch against the spring pressure is necessary to permit the throwing lever to descend into the yoke. Such possibility of the obstruction of the downward movement of the throwing lever may result in the switch being left partly open with disastrous consequences. Such may be the case especially when the throw-

ing lever is thrown over hurriedly by a switchman who depends on the action of gravity to carry the lever down to its proper position in the yoke, and who, for this reason, gives the switch no further attention after throwing the lever. Under such circumstances, if it is necessary for the descending throwing lever to force the entire latch forward against the pressure of the spring, the action of gravity on the throwing lever may be opposed to such an extent that the throwing lever will not pass the extension of the latch but will rebound, acted upon by the elastic resistance of the spring, and when it finally comes to rest it will be resting on the upper side of the extension of the latch, as hereinbefore stated.

When the weight of the auxiliary latch is to be overcome, the action of gravity on the lever thus thrown over is ample to carry it completely below the extension of the auxiliary latch, and once the lever is below the extension, it cannot be removed from the yoke of the stand without overcoming the resistance of the spring which, as hereinbefore set forth, due to the presentation of the lower surface of the extension of the auxiliary latch at substantially right angles to the line of upward movement of the lever, can only be accomplished by bringing a proportionately great force to bear on the throwing lever, and which force will only be exerted by the passage of a train through the switch.

For the purpose of locking the stand in position to hold the throwing lever down in the yoke of the stand and thus prevent the operation of the switch, the member 5 of the stand is provided with an ear 19 extending forwardly, and the auxiliary latch 17 is also provided with an ear 20 extending forwardly alongside the ear 19 of the stand, both of these ears 19 and 20 being provided with openings which are adapted to be in alignment when the auxiliary latch 17 is in its normal position with its extension 17^a projecting over the throwing lever in the yoke. Thus, the shackle of a pad-lock may be inserted through these openings and the pad-lock may be used to prevent the stand from being operated either automatically or manually.

In order to preclude the possibility of the auxiliary latch 17 being secured in its forward raised position, and thus in position to be inoperative for holding the throwing lever in the yoke, either carelessly or otherwise, by means of inserting the shackle of the lock or any other object through the opening in the ear 20 of the auxiliary latch 17 above the upper side of the member 5, this member 5 is so shaped on its upper side that it will almost completely obstruct said opening in the ear of the auxiliary latch even when said auxiliary latch is in its ex-

treme upper position. This is best illustrated in Fig. 2 of the drawing.

In order to cover the spaces between the inner side of the members 5 and 6 and the adjacent sides of the main latch and auxiliary latch and thus avoid the possibility of any obstruction entering said spaces to clog the latch, the upper end of the main latch 7 is provided with projections 21 extending substantially horizontally from the front to the rear of the latch and covering the upper ends of said spaces. Preferably, the lug 16 on the main latch 7 is not depended upon to resist the entire strain liable to be imposed by the pressure of the throwing lever upward against the lower side of the extension 17^a, of the auxiliary latch 17, but the opening in said auxiliary latch which receives the lug 16 is of somewhat greater diameter than that of the lug, and the upper termination of the recess 15 is properly shaped and proportioned to constitute a shoulder against which the upper side of the auxiliary latch 17 may bear when the strain is imposed upon it by the lever. Thus the lug 16 only forms a pivot for the auxiliary latch to turn on when it is yielding to the downward pressure of the lever.

As will be noted, the latch may be operated as usual by engaging the foot with the treadle 13. It also may be operated by raising the auxiliary latch 17 with the hand, making it unnecessary to move the main latch when releasing the throwing lever. Thus, while two methods of manually operating the switch stand are afforded, the stand at all times retains its functions which consist in guarding against accidental opening of the switch when trains are passing over the switch, and against destruction of the switch and its operating mechanism when trains run through the switch, as well as in its function, which consists in the perfect seating of the throwing lever, and, consequently, the complete closing of the switch each time the switch is operated manually. It will also be noted that when a train runs through the switch and the switch throwing lever rises, as permitted by the yieldable latch just described, this switch throwing lever will be allowed to seat in the yoke again after the train has passed through the switch, whereas, without the use of the auxiliary latch on the main latch, forming a compound latch, the switch throwing lever would be very liable to merely rest on the upper side of the extension of the latch, as set forth in connection with the description of the liability of the lever to thus remain on the upper side of the extension when it is thrown over hurriedly by a switchman, and receives no further attention from him. Thus, the functions of my improved compound double automatic latch are correlative.

It will be apparent that my invention is capable of some modification without departure from the scope and spirit thereof.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a compound double automatic latch, a stand having a yoke adapted to receive a throwing lever and having its upper forward part bifurcated, a main latch pivotally mounted between the members of the bifurcated part of the stand and having a recess in one of its sides, an auxiliary latch located in the recess in the side of the main latch and pivotally secured to said main latch, the auxiliary latch having an extension projecting into the yoke, the auxiliary latch and the recess in the main latch being so shaped with respect to each other that the auxiliary latch may yield to remove its extension from the yoke without the movement of the main latch when said extension is engaged from above, but that the auxiliary latch may not move with respect to the main latch when the extension is engaged from below, said extension being adapted to engage with the throwing lever which is received by the yoke.

2. In a compound double automatic latch, a stand having a yoke adapted to receive a throwing lever and having its upper forward part bifurcated, a main latch pivotally mounted between the members of the bifurcated part of the stand and having a recess in one of its sides, an auxiliary latch located in the recess in the side of the main latch and pivotally secured to said main latch, the auxiliary latch having an extension projecting into the yoke, the auxiliary latch and the recess in the main latch being so shaped with respect to each other that the auxiliary latch may yield to remove its extension from the yoke without the movement of the main latch when said extension is engaged from above, and the bifurcated part of the stand and the main latch and auxiliary latch being so proportioned with respect to each other that spaces are left between the inner sides of the bifurcated parts of the stand and the adjacent sides of said latches, the main latch having lateral extensions covering the upper ends of said spaces to prevent the entrance of obstructions into the spaces.

3. In a compound double automatic latch, a stand adapted to receive a throwing lever, a main latch, an auxiliary latch movable with respect to the main latch when the stand is receiving the throwing lever but being immovable with respect to the main latch against removal of the throwing lever from the stand, an ear on the auxiliary latch and an ear on the stand, said ears having openings adapted to be in alinement

when the auxiliary latch is immovable against the removal of said throwing lever.

4. In a compound double automatic latch, a stand having a yoke adapted to receive a throwing lever, a main latch having a recess in one of its sides and an auxiliary latch located in the recess in the side of the main latch and pivotally secured to the main part, the auxiliary latch having an extension projecting into the yoke on one side of its pivotal connection with the main latch and being so proportioned that it has an excess of weight on the side of its pivotal connection opposite from the extension, whereby said extension is normally held within the yoke by the action of gravity, the auxiliary latch and the recess in which it is located being so shaped with respect to each other that the auxiliary latch may yield to remove its extension from the yoke against the action of gravity without the movement of the main latch, but that the auxiliary latch may not move in the direction of the action of gravity thereon from its normal position maintained by said action, the extension on the auxiliary latch being adapted to engage with the throwing lever which is received by the yoke.

5. In a compound double automatic latch, a stand having a yoke adapted to receive a throwing lever, a main latch pivotally mounted in the stand, an auxiliary latch pivotally secured to said main latch, the auxiliary latch having an extension projecting into the yoke, the main latch and the auxiliary latch being so shaped with respect to each other that the auxiliary latch may yield to remove its extension from the yoke without the movement of the main latch when said extension is engaged from above, but that the auxiliary latch may not move with respect to the main latch when the extension is engaged from below, said extension being adapted to engage with the lever which is received by the yoke, an ear on the auxiliary latch and an ear on the stand, said ears having openings adapted to come into alinement to receive the shackle of a lock for maintaining the extension on the auxiliary latch in position for preventing the raising of the throwing lever, and the stand having an extension adapted to cover the opening in the ear of the auxiliary latch when the auxiliary latch is out of position for engaging its extension with the throwing lever, whereby the insertion of the shackle of a lock into the opening in the ear of the auxiliary latch, when it is in such position, is prevented.

FRANK C. ANDERSON.

Witnesses:

JAMES N. RAMSEY,
CLARENCE PUDEB.