No. 660,665. Patented Oct. 30, 1900.

C. SULFER.

RAILWAY SWITCH LOCKING DEVICE.

(Application filed June 2, 1900.)

(No Model.) 4 Sheets—Sheet 1.

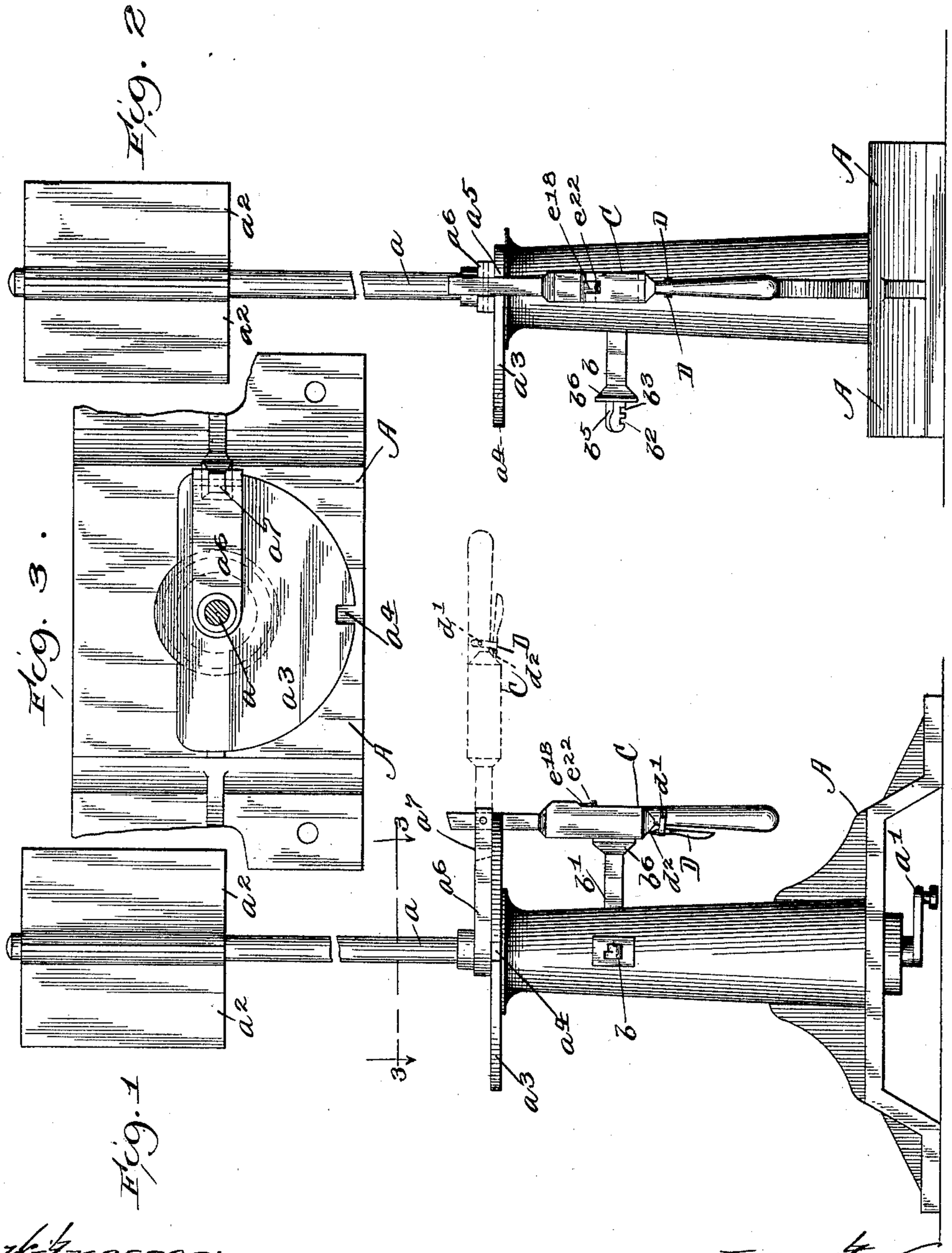

Fig. 3.

Fig. 1.

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RAILWAY SWITCH LOCKING DEVICE.

(Application filed June 2, 1900.)

(No Model.) 4 Sheets—Sheet 2.

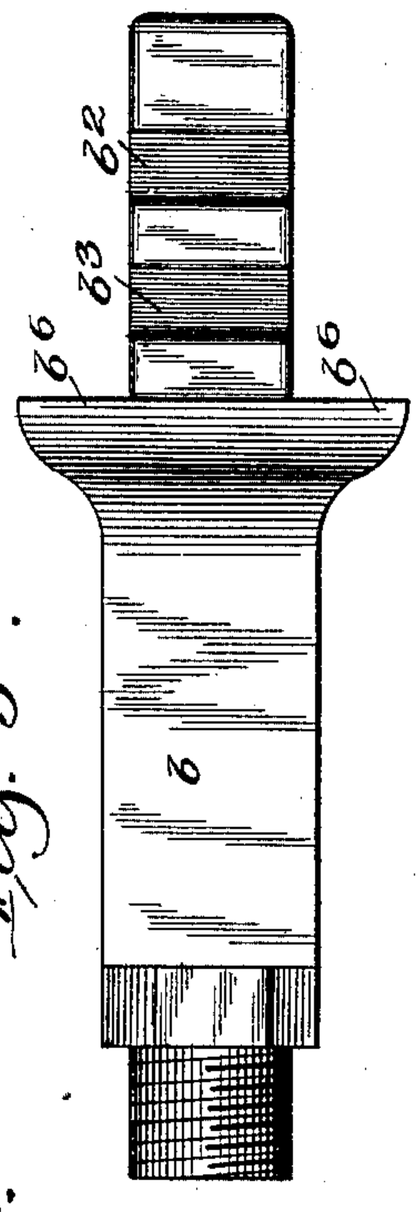

Fig. 5.

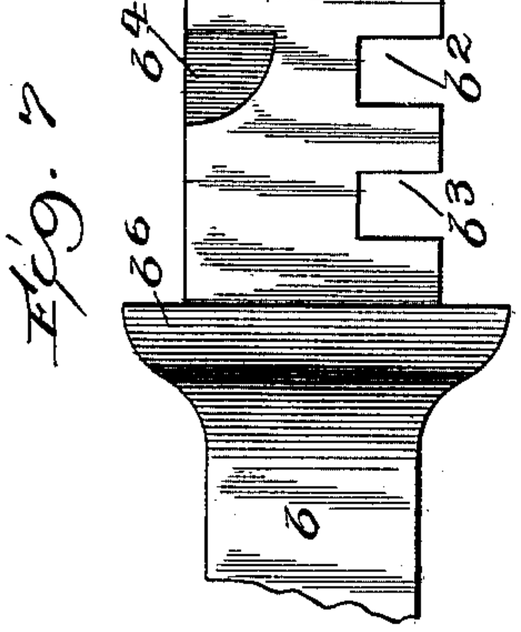

Fig. 7.

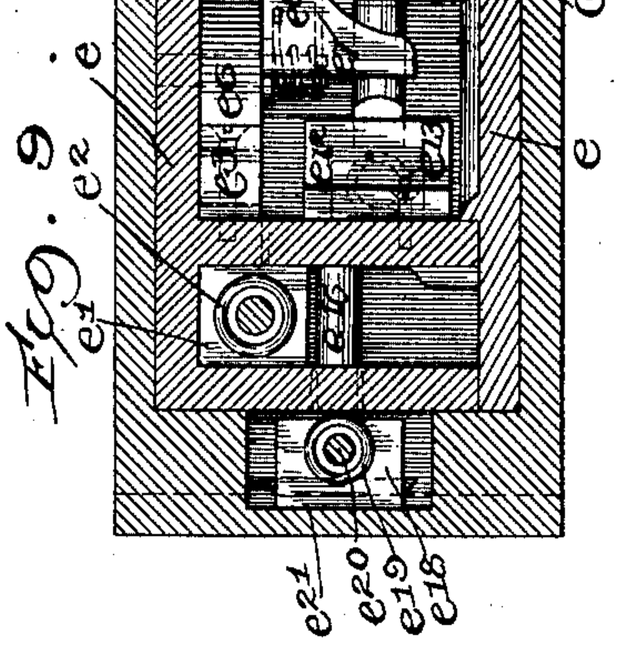

Fig. 9.

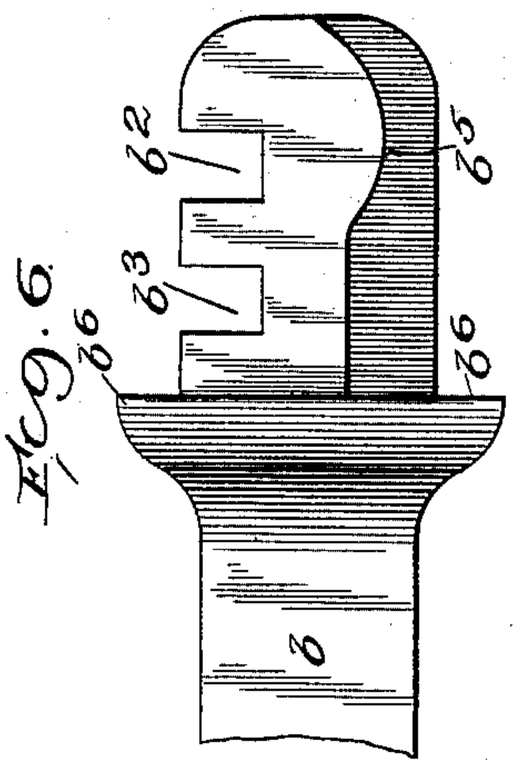

Fig. 6.

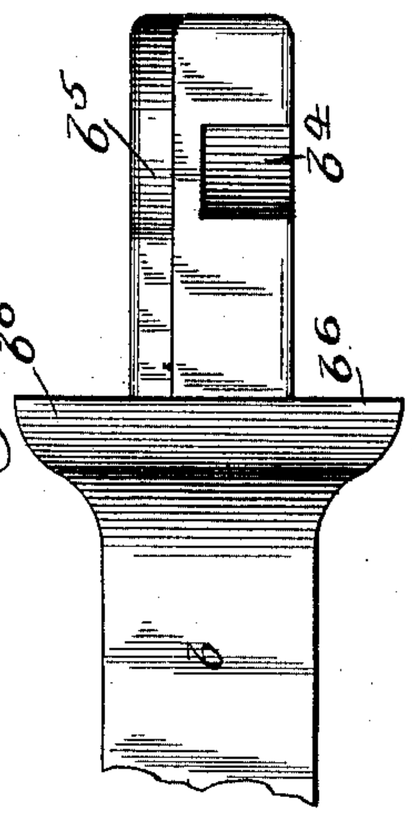

Fig. 8.

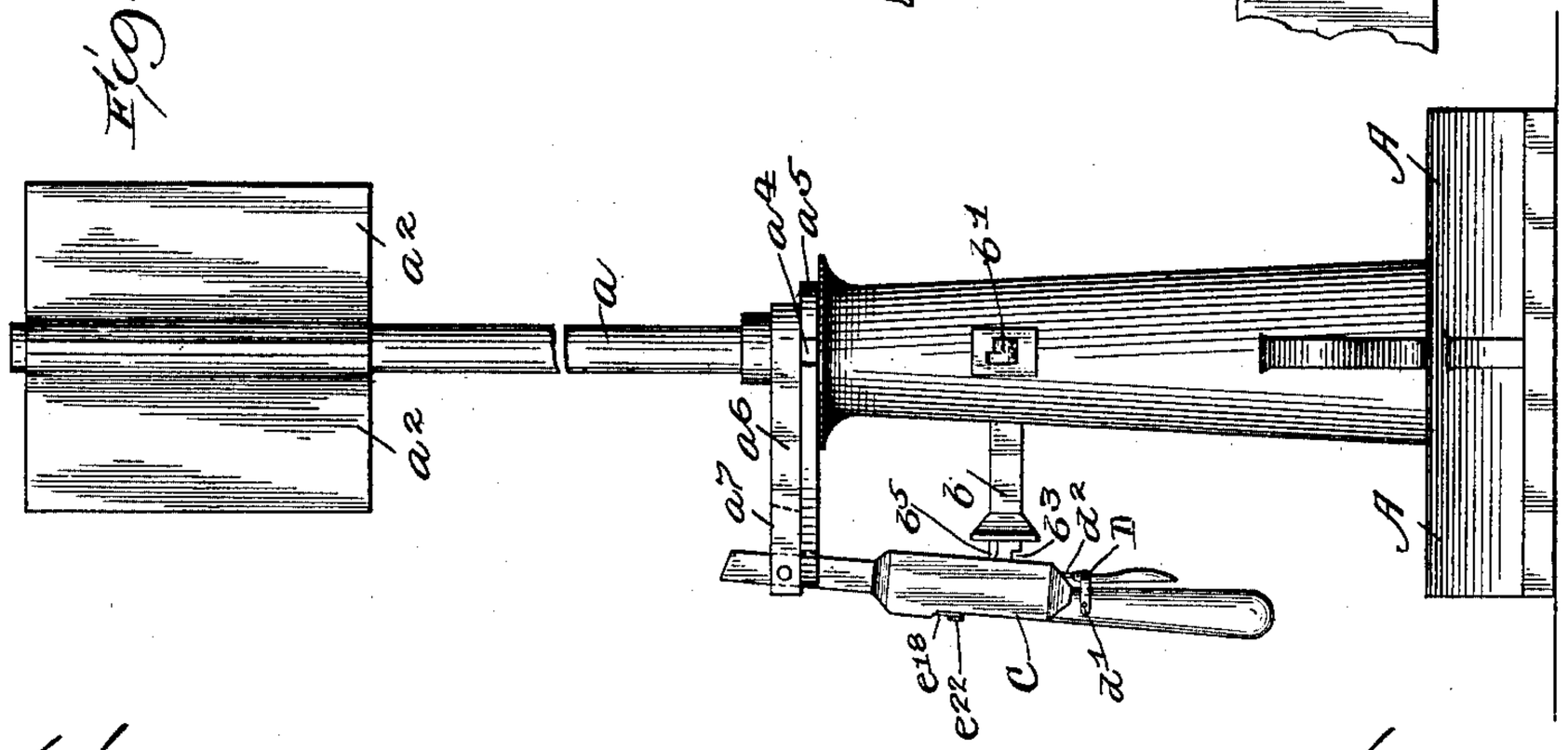

Fig. 4.

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No. 660,665. Patented Oct. 30, 1900.

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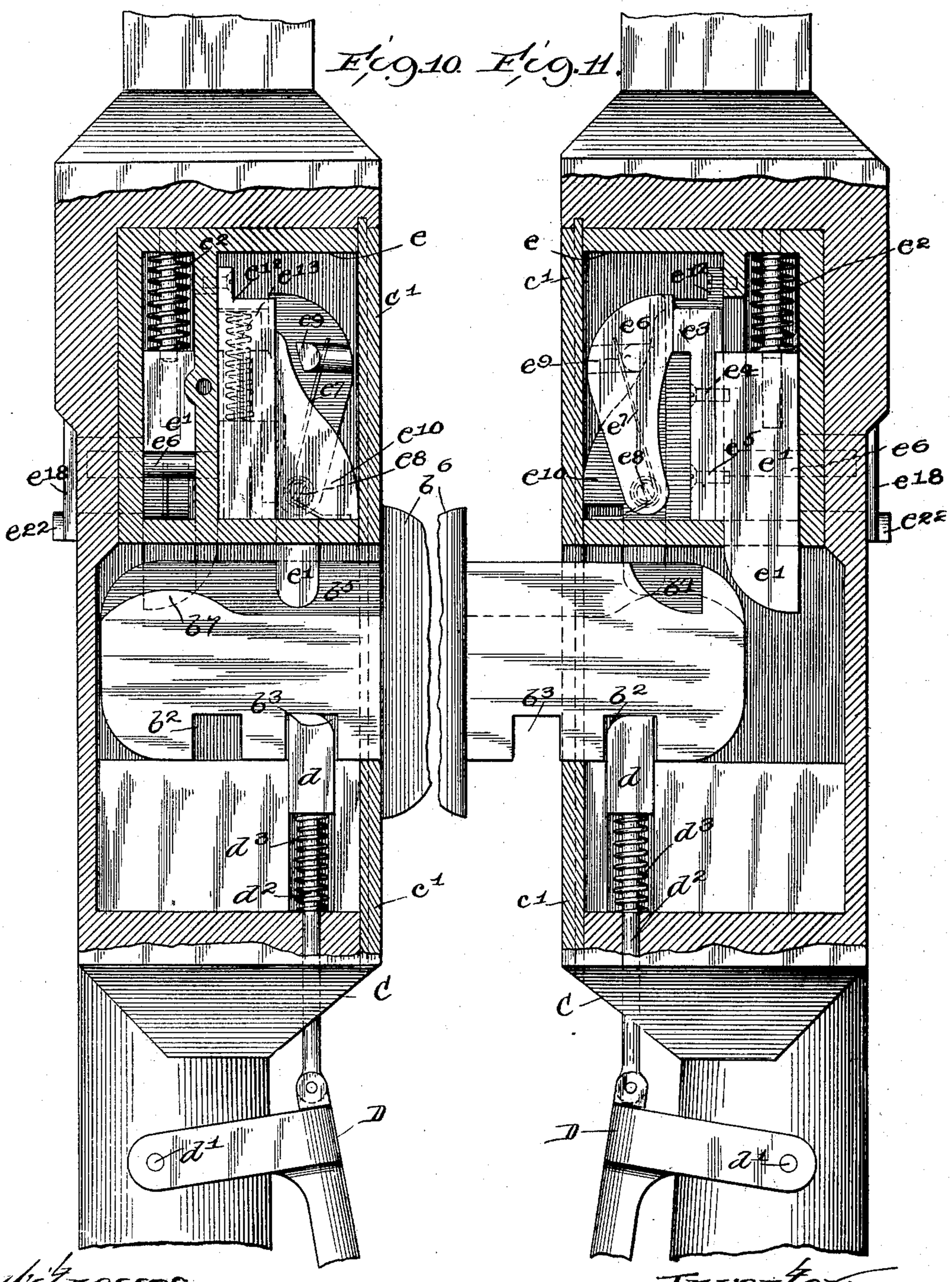
RAILWAY SWITCH LOCKING DEVICE.

(Application filed June 2, 1900.)

(No Model.) 4 Sheets—Sheet 3.

Fig. 10. Fig. 11.



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No. 660,665. Patented Oct. 30, 1900.

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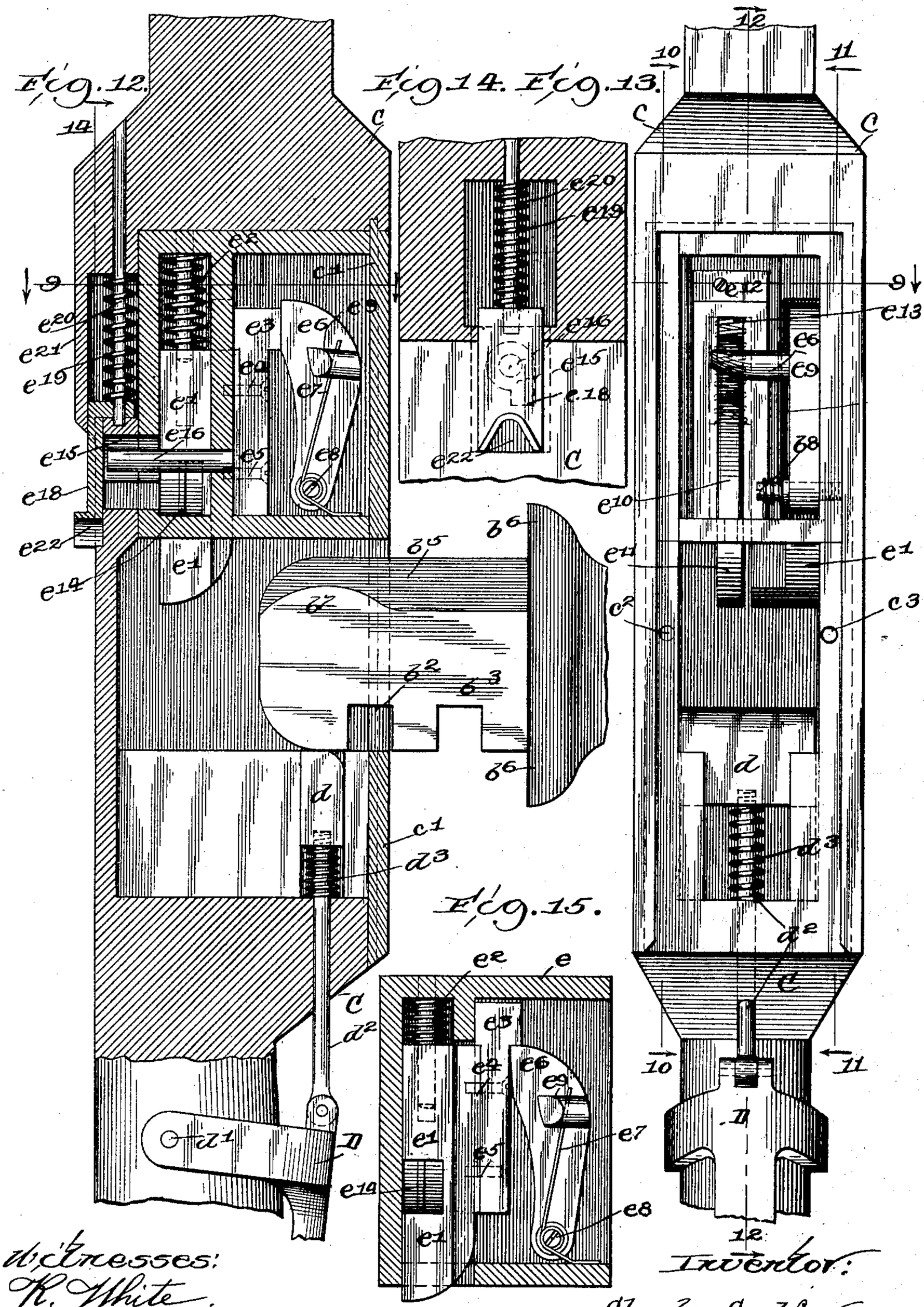
RAILWAY SWITCH LOCKING DEVICE.

(Application filed June 2, 1900.)

(No Model.) 4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

CHARLES SULFER, OF SAN ANTONIO, TEXAS, ASSIGNOR OF ONE-HALF TO JOHN G. PEEBLES, JR., OF PORTSMOUTH, OHIO.

RAILWAY-SWITCH-LOCKING DEVICE.

SPECIFICATION forming part of Letters Patent No. 660,665, dated October 30, 1900.

Application filed June 2, 1900. Serial No. 18,807. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SULFER, a citizen of the United States, residing at San Antonio, county of Bexar, and State of Texas, have invented certain new and useful Improvements in Railway-Switch-Locking Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable persons skilled in the art to which it appertains to make and use the same.

One object of my invention is to provide a switch-locking device comprising a lock contained within the switch-lever of the switch-stand, by the use of which the switch may be more quickly and positively manipulated and finally locked in position. The lock being an integral part of the switching device, the probability of it becoming detached therefrom and lost is eliminated. As a result of the construction of my device the lock parts may be made much larger and stronger than is usual with padlocks, and being contained within the handle of a switch-lever they are protected from the possibility of injury from blows that would destroy the ordinary padlock. The lock is also protected from ice, snow, dust, and rain.

Another object of my invention is to provide a device whereby the switch may be turned from time to time and locked temporarily but positively with reference to its position each time it is turned and unlocked each time it is manipulated by means of an auxiliary lever, which I shall call the "safety" device, and which is attached to the main switch-lever, and without the use of the usual key after the switch has been once unlocked by means of the key, and whereby the switch may then be permanently and finally locked by means of the auxiliary lever aforesaid.

In the drawings, Figure 1 is a side elevation of an ordinary railway-switch stand, showing my switch-lever locked in position and showing the lever in dotted lines in position prior to throwing the switch. Fig. 2 is a front view of the same. Fig. 3 is a plan view and a section through line 3 3 of Fig. 1. Fig. 4 is a side elevation similar to Fig. 1, showing the switch temporarily locked. Fig. 5 is an enlarged view of the stud to which the switch-lever locks looking from below. Fig. 6 is a similar view inverted, showing one side of the stud. Fig. 7 is a view of the same, showing the opposite side. Fig. 8 is a view of the stud looking from above. Fig. 9 is a section through the main switch-lever and lock, taken on line 9 9 of Fig. 13. Fig. 10 is a longitudinal section of the lock and a part of the switch-lever, taken on line 10 10 of Fig. 13, showing the members locked together. Fig. 11 is a similar view taken on lines 11 11 of Fig. 13, showing the members temporarily locked. Fig. 12 is a view similar to Fig. 10, showing the stud entering the interior of the lever. Fig. 13 is a front view of the switch-lever and lock with a sliding covering-plate removed. Fig. 14 is a section on line 14 14 of Fig. 12, showing the latch that covers the keyhole. Fig. 15 is a section through the lock on line 15 15 of Fig. 9.

In all the views the same letters are used to indicate similar parts.

A is an ordinary switch-stand provided with a vertical shaft a, the lower end terminating in a crank-arm a', the upper end supporting a suitable semiphoric device a^2 for indicating the direction to which the switch is thrown. The shaft a has bearings within the stand A at the top and bottom thereof. The stand is capped with a semicircular disk a^3, which is fixed thereto and which is provided with notches a^4 a^5. A radial arm a^6 is fixed to the shaft a, by means of which the shaft may be rotated in its bearings. A mortise a^7 is made into the outwardly-extending terminal of the radial arm a^6, in which my switch-lever and locking device C are pivoted. Studs b and b' are fixed into the body part of the stand A at points immediately below the notches a^4 and a^5, respectively, of the disk a^3, so they will enter the locking device C when the latter is in a vertical position, as shown in Fig. 1.

Figs. 1, 2, and 10 show the locking device C and stud b in position locked together, which cannot be unlocked again except by the use of the ordinary detached key.

Figs. 4 and 11 show the stud caught in the first notch by the bolt d of the safety device D. The safety device consists of a forked lever D, pivoted at d' on the handle C. The forked lever D is connected to a rod d^2, which is a part of the bolt d or may be attached

thereto. An open spiral spring d^3 surrounds the rod d^2 and maintains the bolt d in an upward position. It also raises the forked end of the lever D and holds the said lever removed from the handle C, as shown in Figs. 10 and 11.

The lock proper of the device is contained within the case e. The latch-bolt e' is held in a distended downward position by means of the open spiral spring e^2. A piece e^3 is connected to the latch-bolt e' by means of screws e^4 and e^5. This is made separate from the latch-bolt only for ease of construction. At the upper end of this piece a notch or shoulder is provided, under which the dog e^6 is adapted to engage. The dog is held, by means of a spring e^7, against the piece e^3, so as to readily engage with the notch or shoulder of the said piece whenever the latch-bolt e' is raised, as shown in Fig. 15. The spring e^2 is compressed, and the dog e^6 will engage under the notch or shoulder e^3. A projection e^9 of the dog e^6 extends laterally, and against this projection the spring e^7 bears. A wedge-shaped piece e^{10} is provided with an extension e^{11}, which projects downwardly through the case e in the path of the stud b. It also projects laterally into the spring-case e^{12} and is held in the position shown in Fig. 10 by the open spiral spring e^{13}, which is within said case. When this wedge-shaped piece e^{10} is raised, it forces back the dog e^6 by coming in contact with the projection e^9 of the said dog, which pushes the dog laterally and out of the notch e^3, with which it is at the time engaged, and thereupon the spring e^2 forces the latch-bolt down in the position shown in Figs. 10 and 11, after which the wedge-shaped seat returns to its normal position by means of spring e^{13}. (Shown in these figures.)

e^{15} is a keyhole.

e^{16} is the stud over which the key passes when it is inserted in the keyhole.

e^{17} is a ward that fits into the key.

e^{18} is a slide that passes up over and opens and closes the keyhole e^{16}. The slide is held in the position shown in Fig. 12 by means of the open spiral spring e^{19}, which surrounds the stud e^{20}. The slide e^{18} is covered by a plate e^{21}, and the slide also is guided in grooves in the face of the device C, which grooves are shown in dotted lines in Fig. 14. An inverted-V-shaped notch e^{22} is cut in the base of the slide and serves for the purpose of guiding the key and as a means for raising the slide until the key arrives at a point over the keyhole. The key lifts the slide a^{18} sufficiently high for the key to be inserted over the stud e^{16}. It may then be passed into the lock, and it will turn over the ward e^{14} or such other wards as may be therein provided and engage with the latch-bolt e' and raise the latch-bolt until the dog e^6 engages with the shoulder in the upper part of the piece e^3, which latter part e^3 has been raised with the latch-bolt e' by the act of turning the key. The latch-bolt e' will then be held raised against the tension of the spring e^2, which tends to force it downwardly in the position it occupies in Figs. 12 and 13.

Referring now to Figs. 5, 6, 7, and 8, which represent the several views of the stud b, the two notches b^2 and b^3 (shown more plainly in Figs. 10 and 11) are cut into the lower part of the stud for the purpose of engaging the bolt d of the safety device D. It will be noticed in Fig. 11 that the bolt d has entered the notch b^2, and the switch-lever will be held positively thereby in that position and may be unlocked by simply compressing the handle of D against the handle of C, by which means the bolt d will be withdrawn from the notch b^2, and the two members of the locking device may be then readily separated. In the position shown in Fig. 11 it will be noticed that the latch-bolt e' has not yet engaged with the notch b^4 for the purpose of permanently locking the device. When the handle D is compressed by the hands of the switch-operator, and thereby the bolt d is withdrawn from the notch b^2 and the handle C is then forced against the stud b, the latch-bolt e' will engage with the notch b^4 in the stub b, and at this time the bolt d will enter the notch b^3.

All of the parts of the lock may be contained in the case e, and a properly-shaped receptacle is made within the interior of the handle C, into which the case containing the lock mechanism may be placed.

The lock-pieces may be made interchangeable, so that any piece may fit into any lock-case, and the cases may be made with reference to the handle device C so that any lock-case will fit into any handle. After the lock has been placed in the position shown with reference to the parts of the handle the sliding front cap c' covers all of the openings in the face of the device except the opening which is adapted for the entrance of the stud b. The screws c^2 and c^3 are preferably countersunk into the face of the slide c' and enter the frame of the handle C and are located so they will be covered by the flange b^6 of the stud b. By this arrangement the sliding cover cannot be removed when the two members of my device are locked together. A depression b^5 is cut into the upper surface of the stud b, which terminates in a double incline b^7 near the end thereof. The double incline is adapted to engage with and raise the downwardly-projecting extension e^{11}, Fig. 11, of the wedge-shaped piece e^{10} when the stud b is withdrawn from the interior of the handle C.

The use and operation of my device are as follows: The switch-lever C is normally in a vertical position. The stud b enters the switch-lever and is locked therein, as shown in detail in Fig. 10. The switch-lever C has entered the slot a^5, and by that means the radial arm a^6, which is attached firmly to the vertical shaft a, is held in position. Referring now to Fig. 12, to unlock the switch the key should be introduced beneath the projecting invert-

ed-V-shaped latch c^{22}, which is raised by an upward pressure of the key until the key comes directly over the keyhole e^{15}. The key is then inserted over the stud e^{16} and turned to the right, when it will engage with the latch-bolt e' and will raise the latch-bolt. When the latch-bolt is thus raised, the dog e^6 will engage under the shoulder e^3, and the latch-bolt will be thus held in position and out of contact with the stud b. Now if the lever D is depressed and the bolt d is thereby withdrawn from the notch b^3 of the stud b the switch-lever may then be lifted into the position shown in dotted lines in Fig. 1, and then by means of the lever C the switch may be turned by rotating the shaft a and thereby the crank-arm a'. Fig. 15 shows the position of the latch-bolt e' and the dog e^6 when the lock has been opened with the key as described. When the switch-lever is withdrawn from the stud b, the projection e^{11} will be lifted by the double incline b^7 on the stud b. The wedge-shaped piece e^{10} will be raised, which will push the dog e^6 out of contact with the piece e^3 by entering in between the lateral projection e^9 of the dog e^6 and the piece e^3 of the latch-bolt e', and thereby force the dog e^6 from engagement with the latch-bolt e', when the latter will be forced downwardly, as shown in Figs. 12 and 13. The latch-bolt e' is thus disengaged from its unlocked position by the operation of the projection e^{11} of the wedge-shaped piece e^{10}, and the lock is then in position to be reëngaged with the stud b whenever the stud b is again fully inserted within the lever C for the purpose of locking the two members together. It frequently happens in the manipulation of a switch of this character that it becomes necessary to turn the switch a number of times before it is required to finally lock the switch in its normal position, and for this purpose I use a safety device, (indicated as D.)

The operation of the safety device is as follows: When the lever C is first pushed into contact with the stud b, the bolt d is depressed by the lower edge of the stud b, and as the lever C is pushed further into contact with the stud b the bolt d will engage with the notch b^2 of the stud b, and the lever C cannot be further pushed on to the stud b until the safety device in the lever C is compressed by the hand of the operator, as shown in Fig. 12, when it is so compressed and held in that position. Then the lever C may be pushed further until it is in a vertical position, as shown in Fig. 1, when the latch-bolt e' will engage with the notch b^4 of the stud b, and the device will then be permanently locked and can only be unlocked by the use of the key in the manner heretofore described. When the bolt d of the safety device engages with the notch b^2 in the stud b, the device may be unlocked readily and quickly by simply compressing the lever D of the safety device into the position shown in Fig. 12, when the bolt d may be thus readily withdrawn from the stud b. When it is again necessary to throw the switch and to positively hold all the parts in position, all that is necessary for the operator to do is to depress the switch-handle toward the stud b, without touching the safety device, when the bolt d will invariably and beyond the possibility of failure enter the first notch b^2 and hold the switch as positively in this position as when it is finally locked. The switch-arm C cannot be placed in position so that the latch-bolt e' will enter the notch b^4 without first compressing the safety-device lever D, so as to withdraw the bolt d from the notch b^2. When the device has been locked by means of the latch-bolt e' entering the notch b^4, it will then be observed that the bolt d of the safety device has entered the notch b^3 and tends to strengthen the locking effect. When the two members of the device C and b are in the respective positions shown in Fig. 10, they are held together by the latch-bolt e' and the safety-bolt d. Now if the lever D be compressed and the bolt d withdrawn from the notch b^3 of the stud b the stud will still be held in this locked position with respect to lever C by means of the latch-bolt e', which is engaged with the notch b^4 of the upper surface of the stud b, and thus the two members will be held until the key has been again inserted in the keyhole and the latch-bolt e' raised thereby and held by the dog e^6 in the manner heretofore described.

One great advantage of my device in addition to those heretofore enumerated is the fact that the switch-lever may be readily and positively manipulated and temporarily locked during the time that switching is in operation without the necessity of placing a padlock in an eye every time the switch is turned and with the assurance that the locking has been properly done whenever the switching-lever has been put into its position either to be temporarily or permanently locked. It frequently occurs that the switchman will place the padlock in a position and compress the hasp until it engages with the locking-bolt within the padlock and in doing so imagine that the padlock is in the proper eyebolt beyond the switch-lever, when, as a matter of fact, it is not in the eyebolt at all, and thus the switch is left unlocked and is liable to be thrown by persons who are bent on mischief.

I do not care to limit myself to the exact construction and the number of parts herein shown and described, for many equivalent arrangements could be provided for carrying into effect the essential feature of my invention which I have herein set forth without departing from the spirit thereof.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A switch-locking device comprising a locking member fixed to a stationary part of a switch, another locking member fixed to the shifting part of the said switch, a lock in the

shifting part of said switch, for locking the said parts together, and a safety-latch for engaging the two members, substantially as set forth.

2. A switch-locking device comprising a locking member fixed to the stationary part of a switch, a lever for moving the shifting part of said switch, a locking mechanism within the said lever, and a safety-latch for engaging the two members, substantially as set forth.

3. A switch-locking device comprising a locking member fixed to the stationary part of a switch, a vertical shaft for moving the operative parts thereof, a radial arm fixed to said shaft, a lever pivoted to said arm for rotating said shaft, a locking mechanism fixed to said arm and adapted to engage with the said stationary locking member, and a safety-latch for engaging the two members, substantially as set forth.

4. A switch-locking device comprising a locking member fixed to the stationary part of a switch, a lever for moving the switching mechanism, a lock within the said lever, adapted to engage the stationary member, and a safety-latch for engaging the two members, substantially as set forth.

5. A switch-locking device comprising a locking member fixed to the stationary part of a switch, a lever for moving the switching mechanism, a lock within the said lever, and a safety-latch adapted to engage the said stationary member, before the engagement of the said lock therewith, substantially as set forth.

6. A switch-locking device comprising a stud fixed to the stationary part of a switch, a lever for moving the switching mechanism, a lock within the said lever, an orifice in said lever for the entrance of said stud, and a safety-latch for engaging the two members, substantially as set forth.

7. A switch-locking device comprising a stud fixed to the stationary part of a switch, a lever for moving the switching mechanism, a perforation in said lever for the entrance of said stud, a spring latch-bolt in the path of said stud adapted to be raised by a key, a dog for holding said latch in a raised position and a notch in said stud with which said latch-bolt is adapted to engage, substantially as set forth.

8. A switch-locking device comprising a stud fixed to the stationary part of a switch, a lever for moving the switching mechanism, an orifice in said lever for the entrance of said stud, a notch in said stud, a spring latch-bolt in said lever in the path of said stud, adapted to engage with said notch, and adapted to be raised by a key, a dog for holding said latch in its raised position, a device for disengaging the said spring latch-bolt and dog, and an enlargement on the said stud adapted to operate the said disengaging device when the said lever is removed from said stud, substantially as set forth.

9. A switch-locking device comprising a stud fixed to the stationary part of a switch, a lever for moving the switching mechanism, an orifice in said lever for the entrance of said stud, a lock in said lever adapted to engage with said stud and adapted to be disengaged by a key, a safety-latch on said lever adapted to engage with said stud when said stud is inserted in said orifice and before the engagement of said lock therewith, and a lever for disengaging said safety device, substantially as set forth.

10. A switch-locking device comprising a stud fixed to the stationary part of a switch, a lever for moving the switching mechanism, a chamber in said lever, a lock in said chamber for engaging with said stud, an orifice in said lever for the entrance of said stud, a plate for covering said chamber, a flange on said stud, and screws or the like for holding said plate, said screws covered by said flange when the said stud is inserted within said orifice, substantially as set forth.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 22d day of May, A. D. 1900.

CHARLES SULFER.

Witnesses:
JNO. G. PEEBLES, Jr.,
M. F. ALLEN.