O. B. GRANT.

RAILWAY SWITCH STAND.

APPLICATION FILED AUG. 12, 1908.

932,859.

Patented Aug. 31, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

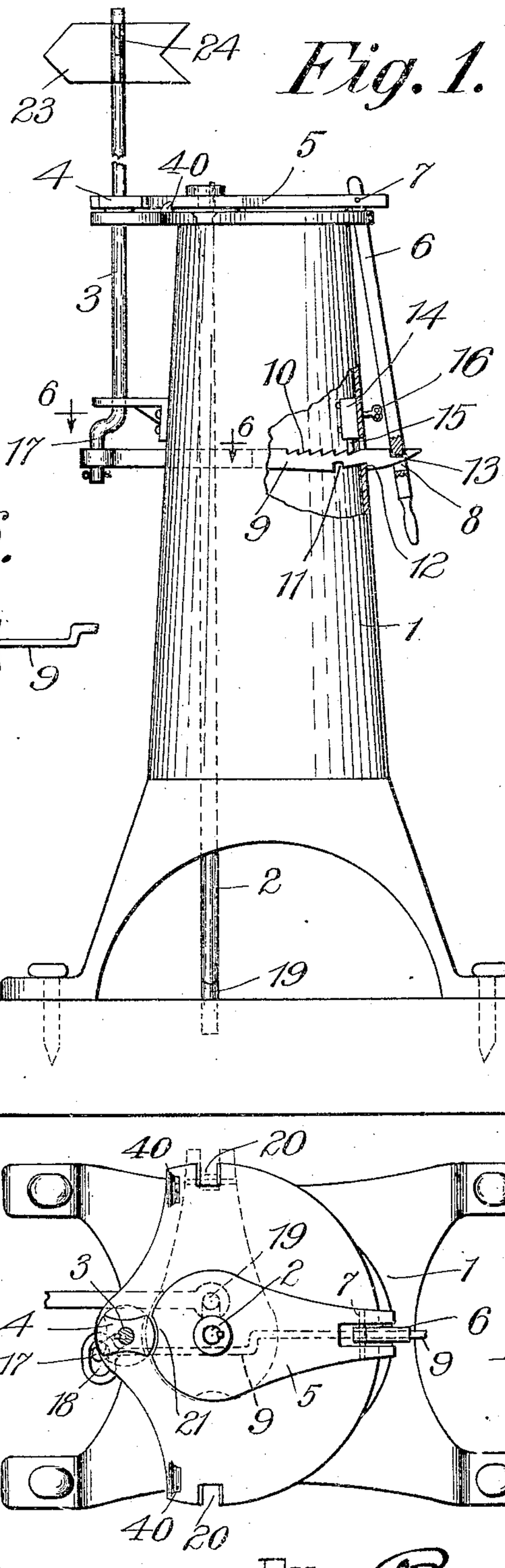

Fig. 5.

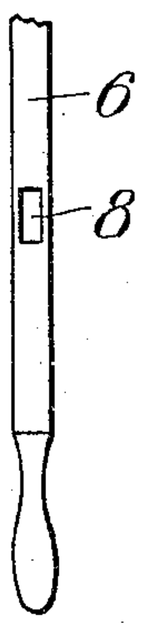

Fig. 6.

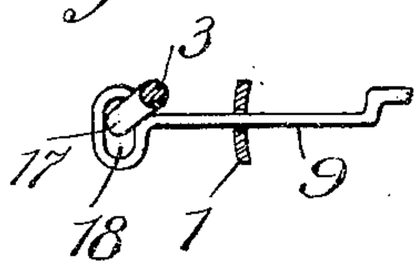

Fig. 2.

Witnesses

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3 SHEETS—SHEET 2.

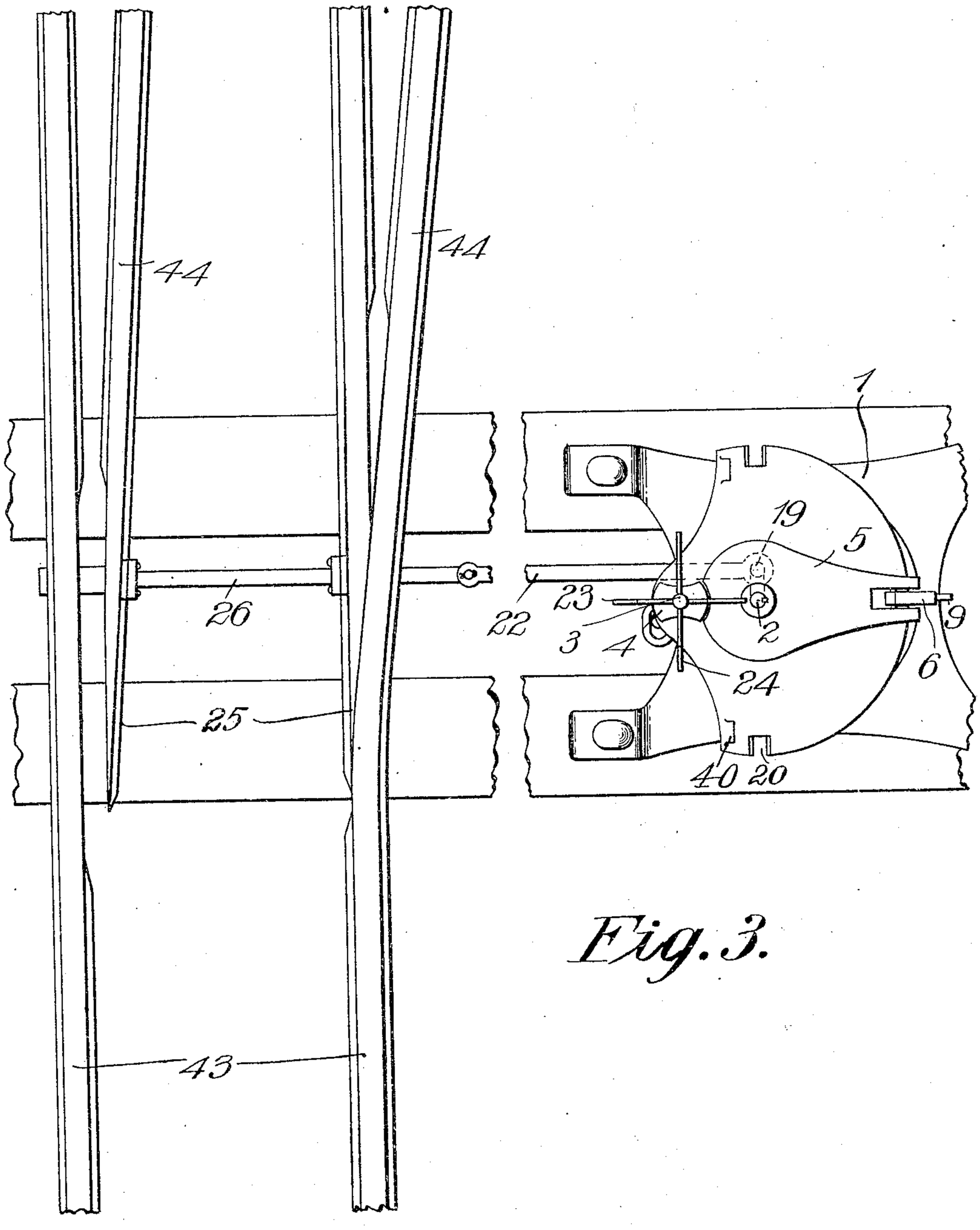

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

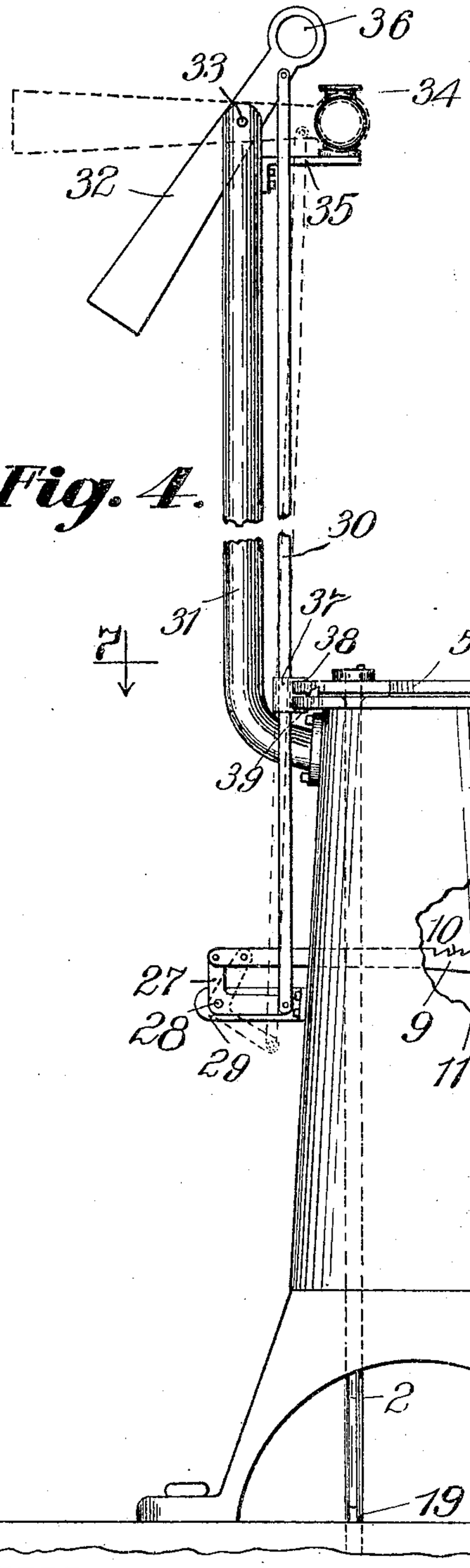
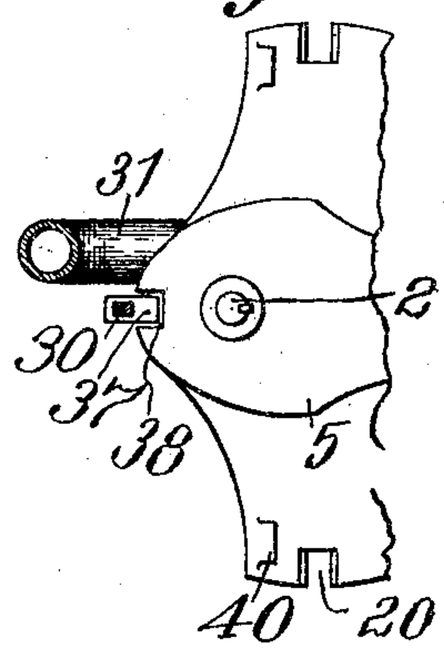


Fig. 2.



Witnesses

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RAILWAY-SWITCH STAND.

932,859. Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed August 12, 1908. Serial No. 448,080.

To all whom it may concern:

Be it known that I, OSCAR B. GRANT, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Railway-Switch Stands, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to railway switch stands of the type ordinarily used for the purpose of operating railway switches, and it is an object of my invention to construct an improved device of this class of such a nature that it will be impossible to give an incorrect visual indication concerning the condition of the switch,—that is, if the targets associated with the switch are in a position to indicate that the main track is clear, it necessitates the operating lever of the switch stand not only being in the position to properly locate the switch points so as to make the main track safe and clear, but in addition requires that the operating lever shall be locked in a position to hold the switch points in "clear" position.

By my invention I further provide that in operating the switch points to open the main track and connect the branch track therewith, before it is possible to displace the switch points from their "clear" position, it is necessary to release the locking mechanism of the switch stand and move the targets from their "clear" to their "danger" position. By my invention I secure this result automatically in the regular operation of the switch-stand lever, no extra motions being required.

The several drawings illustrating my invention are as follows:

Figure 1 is a side view of the switch stand, a part of the side of which is broken away to show the locking mechanism; Fig. 2 is a top view of the switch stand proper, with the indicating targets removed; Fig. 3 is a plan view of the switch points adapted to be controlled by their connections with the switch stand, which is shown in this figure in top view; Fig. 4 is a side view of a modified form of switch stand, in which a semaphore is used, instead of rotary signal indicators, as shown in Figs. 1, 2 and 3; Figs. 5 and 6 are detail views of the construction shown in Figs. 1 to 3, inclusive; and Fig. 7 is a detail view of the parts shown in Fig. 4.

Similar numerals refer to similar parts throughout the several views.

Referring to Figs. 1, 2, 3, 5 and 6, the switch stand consists in a casing 1 supporting in suitable bearings an operating shaft 2, upon the top of which a disk 5 is rigidly secured, and to this disk 5 an operating lever 6 is pivoted, as shown at 7. A signal shaft 3 is also supported from the casing 1, and has secured to it, just above the top of the switch-stand casing, an interlocking member 4 adapted to coöperate with the disk 5 so that when the disk 5 is in its normal or "clear" position the shaft 3 may be rotated, and, furthermore, that in order to rotate the disk 5 it is necessary to impart a quarter of a revolution to the interlocking member 4 and signal shaft 3. When the disk 5 is moved from its normal or "clear" position, as a result of its coöperation with the interlocking number 4, the signal shaft 3 cannot be turned back to its "clear" position until the disk 5 has first been returned to its "clear" position.

The lower end of the signal shaft 3 has formed upon it a crank 17 adapted to engage a slot 18, as shown in Fig. 6, in the end of a bar 9 supported by the casing 1 and adapted to move transversely therein. This bar 9 is pointed at its other end, and is adapted to be engaged by the opening 8 formed in the lower end of the operating lever 6. Notches 10 are formed on the upper edge of the bar 9 to engage the bolt 15 of a spring or gravity lock 14 secured within the casing 1 and adapted to be operated by the key 16. When in the locked position, as shown in Fig. 1, the operating lever 6 engages a notch 13 formed in the upper edge of the bar 9, and can only be released from such notch by first turning the key 16 to disengage the teeth 10 from the lock bolt 15, for which condition the operating lever 6 is moved to the right, carrying the bar 9 with it until the notch 11 formed on the under side of the bar 9 comes opposite to the wall of the casing 1 and engages it. For this position, the operating lever 6 is cleared from the bar

9, and may be moved upward to its horizontal position to release it from the notch 20 formed in the top of the switch stand, in order to rotate the disk 5 and shaft 2 to throw the switch. The motion of the bar 9 to the right just described rotates the shaft 3 a quarter of a revolution and turns the "clear" indicator 23 carried at the top of the shaft 3 out of view, and brings into view the "danger" indicator 24, also carried at the top of the shaft 3. Thus, since the shaft 3 is rotated through a quarter of a revolution, the disk 5 is released from the interlocking member 4, and may be rotated to throw the switch. Stops 40 secured to the top of the switch stand are provided to limit the motion of the disk 5, when the switch is operated.

When it is desired to return the switch points to their position to leave the main track in its normal position or "clear," the operating lever 6 is first moved around to bring the switch points to their "clear" position, and then moved downward to engage the notch 20 in the top of the switch stand, and in order to throw the target indicators to "clear," the operating lever 6 must be moved farther to engage the bar 9, which engagement is first between the lower edge of the opening 8 and the curved under side of the right-hand end of the bar 9. As a result of this engagement, the bar 9 is raised so that the notch 11 is disengaged from the wall of the casing 1 and the notch 13 is engaged by the lever 6. As the lever 6 is moved farther down and to the left, the bar 9 is moved to the left until the shoulder 12 on such bar engages the outer surface of the casing 1, in which position the bar 9 and lever 6 are retained by the lock 14. The motion of the bar 9 to the left just described operates to rotate the shaft 3 a quarter of a revolution, and thus serves to throw the "danger" indicator 24 out of view and to bring into view the "clear" indicator 23.

As shown in Fig. 3, the operating shaft 2 has formed on its lower end a crank 19 connected by a link 22 with a bar 26 secured to the movable switch points 25. These points are so disposed, as indicated, that when in the position shown, which is the "clear" position for the main track 43, the operating mechanism and the indicators of the switch stand are in their normal or "clear" position, while when the operating mechanism of the switch stand is moved to throw the switch points 25, the branch tracks 44—44 are connected with the main track 43.

In the modification shown in Figs. 4 and 7, a semaphore is used, instead of the rotary signal-indicators above described, the operation of this semaphore being as follows: The bar 9 has secured to its left-hand end one arm of a bell crank lever 27 pivoted at 28 to a bracket 29 supported from the casing 1 of the switch stand. The other arm of the bell crank lever 27 is connected by a rod 30 with the semaphore 32, pivoted at 33 in the top of a column 31 from the switch stand. As a result of the connections just described, when the bar 9 is moved to the left to its "clear" position, the semaphore 32 is moved to the position shown in full lines, which may here be assumed as its "clear" position and when the bar 9 is moved to the right, the semaphore 32 is moved to its dotted position, which may here by assumed as its "danger" position. A lantern 34 may be supported by a bracket 35 from the column 31 to serve as a night signal, and operating when exposed by the semaphore 32 to constitute a "clear" signal, and when covered by the red semaphore lens 36 to constitute a "danger" signal.

In Fig. 7 there are shown in top view, the parts coöperating to prevent rotation of the disk 5 when the semaphore 32 is in its "clear" position. These consist in a locking member 37 carried by the rod 30 and so located as to enter the notches 38 and 39 in the disk 5 and the top of the switch stand respectively when the rod 30 is moved to its upper position to move the semaphore 32 to its "clear" position.

As a result of the construction above described, it will be observed that my invention necessitates the positive and proper operation of the switch stand in order to throw into view the proper signal indication concerning the track condition. It is impossible for the indicators to be in their "clear" position when the switch is not closed and in a position to give a "clear" indication of the main track; and, furthermore, it is impossible to throw the indicators to their "clear" position without locking the operating mechanism of the switch stand in a position to not only give a "clear" track indication, but also to establish the "clear" condition of the switch. Furthermore, by securing the lock which is used for retaining the operating mechanism in its "clear" position directly to the switch stand I eliminate a difficulty which has existed to a considerable extent heretofore, consisting in the loss of locks and greater difficulty in unlocking and locking them. As a result of this, besides necessitating an absolutely safe operation of the switch stand in order to give a "clear" indication, I have reduced the work involved in operating the switch stand from that usually involved in operating devices of this kind.

While I have shown my invention in the particular embodiment herein described, I do not, however, wish to limit myself to this particular construction, but desire to claim broadly any equivalent that will suggest itself to those skilled in the art.

What I claim is:

1. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, a lever adapted to successively operate such operating shaft and such signal shaft, and an automatic lock adapted to retain the lever after the operation of the signal shaft to its normal position.

2. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, an operating disk secured to the operating shaft, a lever pivoted to such disk, rotation of such disk by the lever serving to throw the switch, and motion of the lever relatively to the disk serving to simultaneously operate such signal and lock such lever.

3. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, an operating disk secured to the operating shaft, a lever pivoted to such disk, rotation of such disk by the lever serving to throw the switch, a bar adapted to be engaged by the lever when moved relatively to the disk, motion of the bar by the lever serving to operate such signal shaft, and means for automatically locking the bar in its operated position.

4. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, an operating disk secured to the operating shaft, a lever pivoted to such disk, rotation of such disk by the lever serving to throw the switch, and a bar adapted to be engaged by the lever when moved relatively to the disk, motion of the bar by the lever serving to simultaneously operate such signal shaft and lock the bar in its operated position.

5. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, an operating disk secured to the operating shaft, a lever pivoted to such disk, rotation of such disk by the lever serving to throw the switch, a bar adapted to be engaged by the lever when moved relatively to the disk, motion of the bar by the lever serving to rotate the signal shaft, and interlocking mechanism between such shafts adapted to permit rotation of the signal shaft only when the operating shaft is in its normal position.

6. In combination with a railway switch-stand, a shaft for operating the switch, a second shaft for displaying a signal, an operating disk secured to the operating shaft, a lever pivoted to such disk, rotation of such disk by the lever serving to throw the switch, a bar adapted to be engaged by the lever when moved relatively to the disk, motion of the bar by the lever serving to simultaneously operate such signal shaft and lock the bar in its operated position, and interlocking mechanism between such shafts adapted to permit rotation of the signal shaft only when the operating shaft is in its normal position.

7. As a means for operating a railway switch-stand, a lever capable of motion in two planes, coöperating mechanism by which motion of the lever in one plane rotates the signal shaft and its attached signal and motion in the other plane throws the switch, means for automatically retaining the lever after the signal is rotated to its normal position, and interlocking mechanism to prevent rotation of the switch signal except after the switch is moved to its normal position.

8. As a means for operating a railway switch-stand, a lever capable of motion in two planes, coöperating mechanism by which motion of the lever in one plane rotates the switch signal and in the other plane throws the switch, means for simultaneously locking the lever in its operated position and returning the switch signal to its normal position, and interlocking mechanism to prevent rotation of the switch signal except after the switch is moved to its normal position and to prevent throwing of the switch except when the signal shaft is in its "danger" position.

9. In combination with a railway switch-stand, a shaft for operating the switch, an operating disk secured to the operating shaft, a second shaft for displaying a "danger" or "clear" signal according as the operating shaft is in its operated or normal position, a lever pivoted to the disk whereby the operating shaft may be turned, a notched longitudinally-movable bar connected to a crank carried on the lower end of the signal shaft, reciprocation of such bar serving to rotate the signal shaft, such lever adapted to engage such bar when the lever is swung downward on the pivot in the disk, such engagement serving as the lever is moved farther to move the signal from its "danger" to its "clear" indication and to prevent motion of the lever in the reverse direction without changing the signal indication from "clear" to "danger."

10. In combination with a railway switch-stand, a shaft for operating the switch, an operating disk secured to the operating shaft, a second shaft for displaying a "danger" or "clear" signal according as the operating shaft is in its operated or normal position, a lever pivoted to the disk whereby the operating shaft may be turned, a notched longitudinally-movable bar connected to a crank carried on the lower end of the signal shaft, reciprocation of such bar serving to rotate the signal shaft, such lever adapted to engage such bar when the lever is swung downward on the pivot in the disk, such engagement serving as the lever is moved farther to move the signal from its "danger" to its "clear" indication and to

prevent motion of the lever in the reverse direction without changing the signal indication from "clear" to "danger," and a spring lock adapted to engage the notches on the bar as the lever is rotated downward to move the signal to its "clear" indication.

11. In combination with a railway switch-stand, a shaft for operating the switch, an operating disk secured to the operating shaft, a second shaft for displaying a "danger" or "clear" signal according as the operating shaft is in its operated or normal position, a lever pivoted to the disk whereby the operating shaft may be turned, a notched longitudinally-movable bar connected to a crank carried on the lower end of the signal shaft, reciprocation of such bar serving to rotate the signal shaft, such lever adapted to engage such bar when the lever is swung downward on the pivot in the disk, such engagement serving as the lever is moved farther to move the signal from its "danger" to its "clear" indication and to prevent motion of the lever in the reverse direction without changing the signal indication from "clear" to "danger," a spring lock adapted to engage the notches on the bar as the lever is rotated downward to move the signal to its "clear" indication, and interlocking devices between the operating shaft and the signal shaft to prevent rotation of the operating shaft when the signal shaft is in its "clear" position and to permit rotation of the operating shaft when the signal shaft is in its "danger" position, such devices serving to prevent turning the signal shaft from its "danger" to its "clear" position when the operating shaft is not in its "clear" position.

12. In a railway switch-stand, switch-operating mechanism, signal-operating mechanism, a lever adapted to operate such mechanisms, and an automatic lock rigidly secured to the switch-stand for retaining the lever in its operated position after moving the switch and the signal to their normal positions.

13. In a railway switch-stand, a signal operating mechanism, switch operating mechanism, a lever adapted to successively return said mechanisms to a normal position, and a spring lock rigidly secured within the switch-stand for retaining the lever in its operated position after moving the switch and the signal to their normal positions.

14. In combination with a railway switch-stand, a lever for throwing the switch, means associated with said lever for rotating the signal shaft and its attached signal, interlocking mechanism for preventing the throwing of the switch until the completion of the rotation of the switch signal to its "danger" position, and means for automatically locking said lever in position when the switch signal is returned to its normal position.

In witness whereof, I hereunto subscribe my name this 8th day of August, 1908.

OSCAR B. GRANT.

Witnesses:
HUGO H. SCHMIDT,
F. S. WEISBROOK.