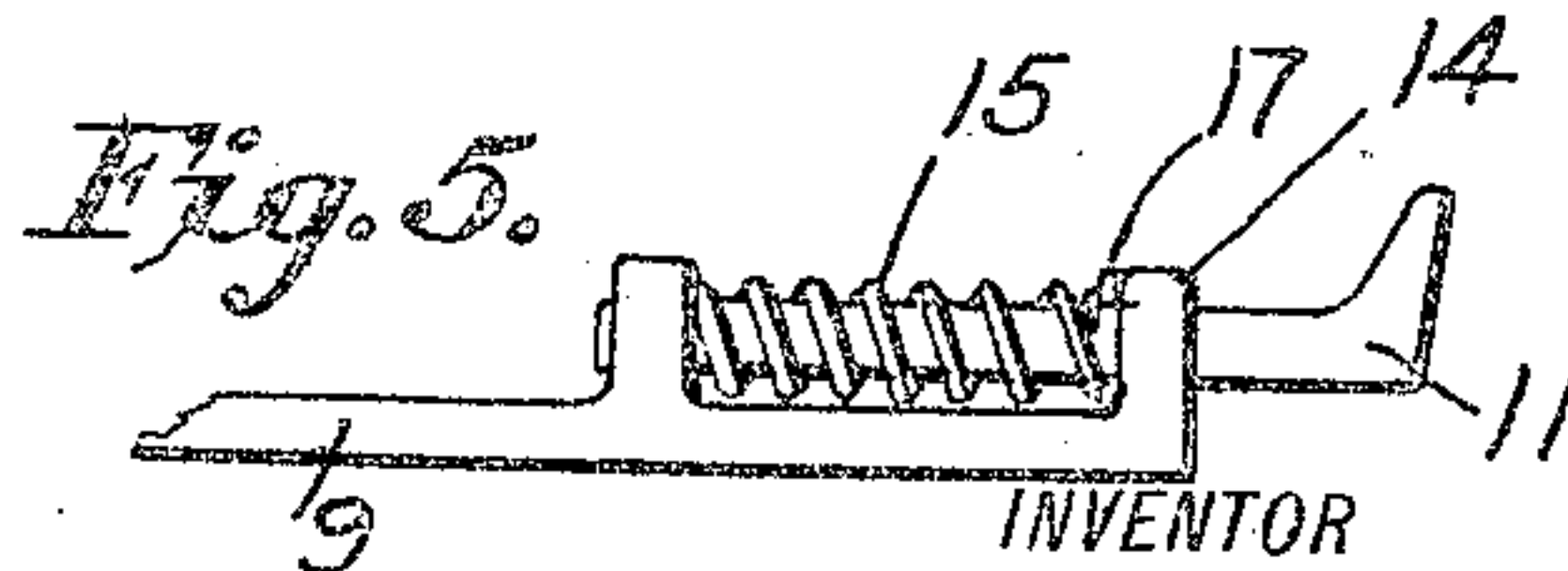
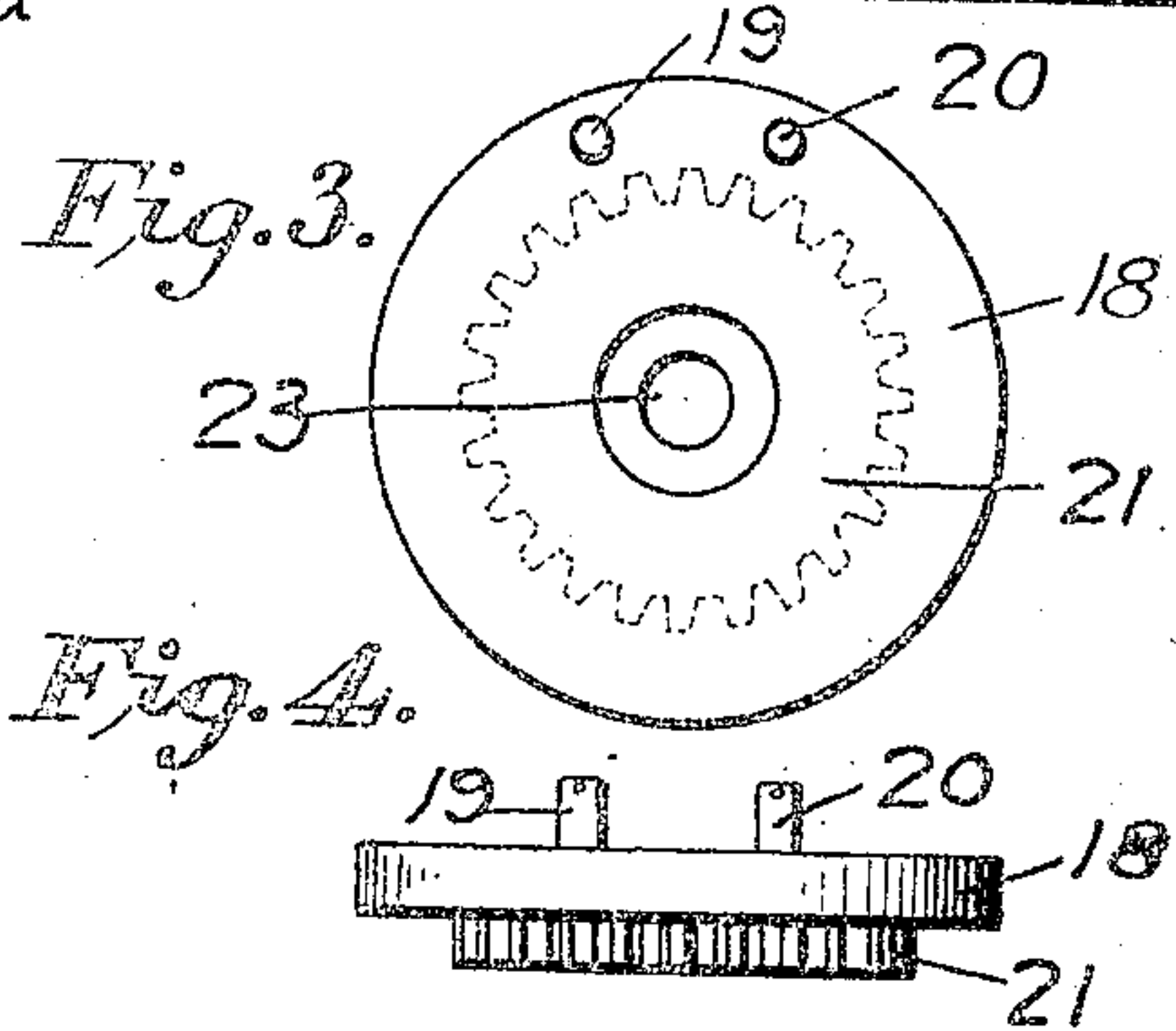
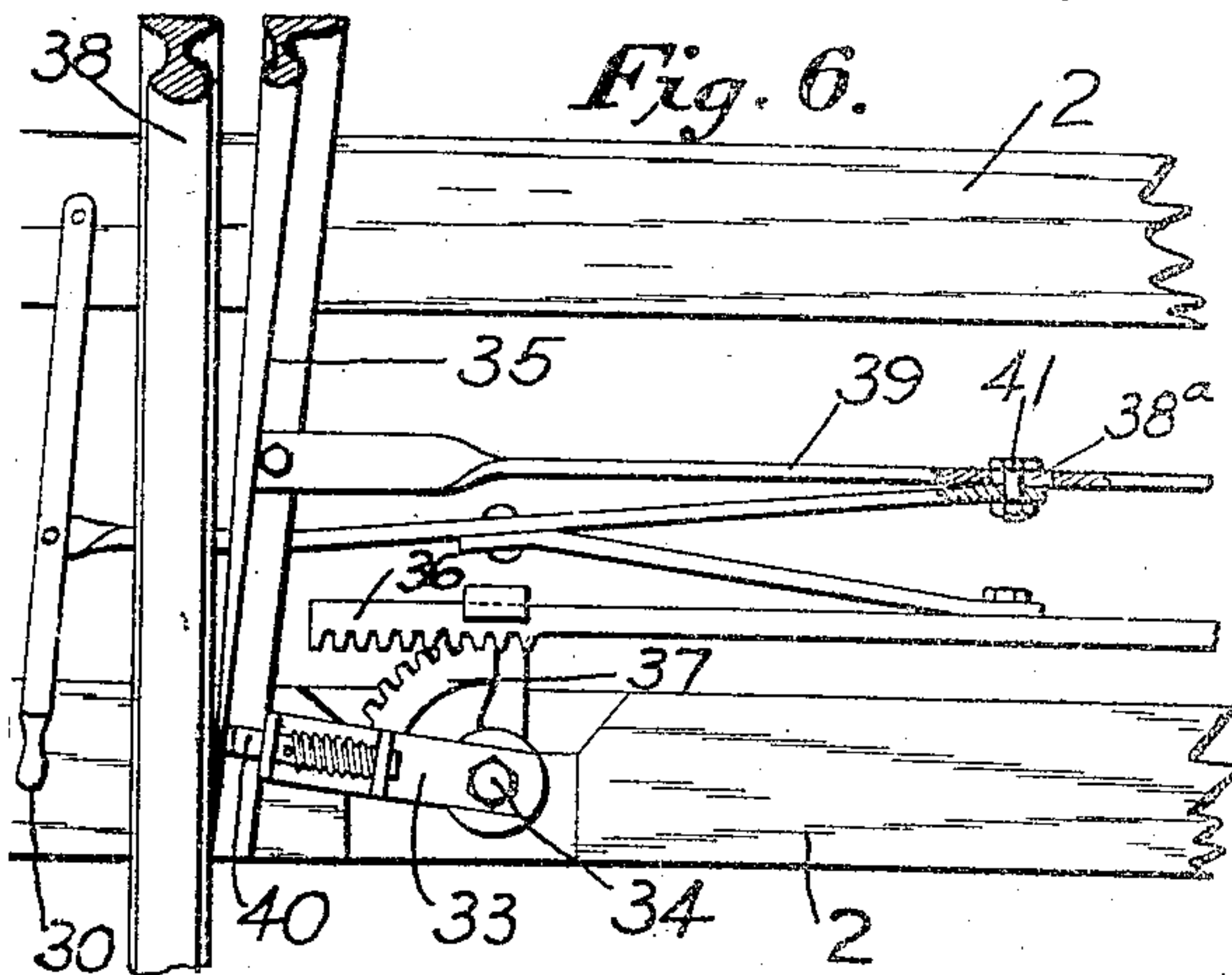
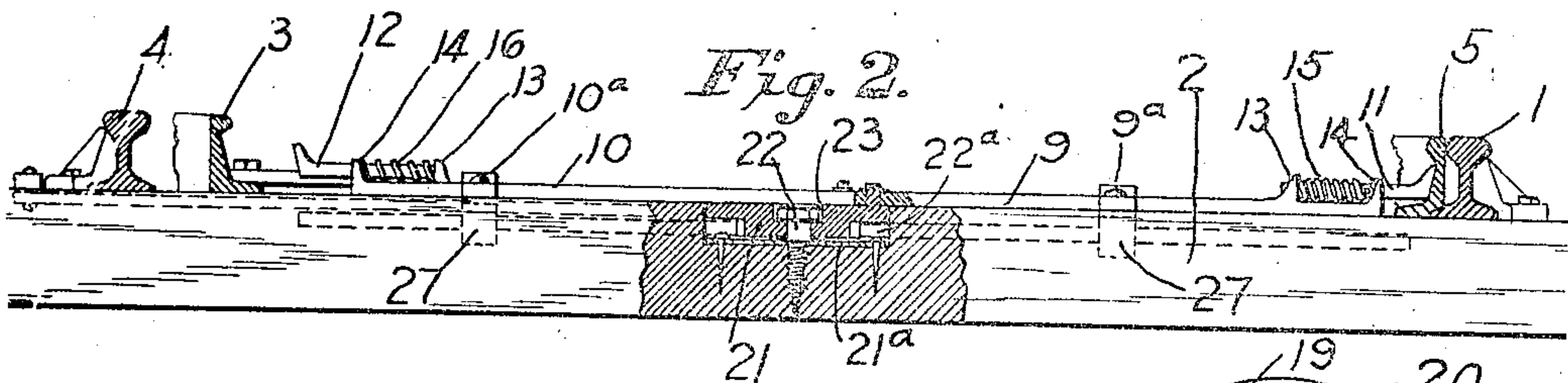
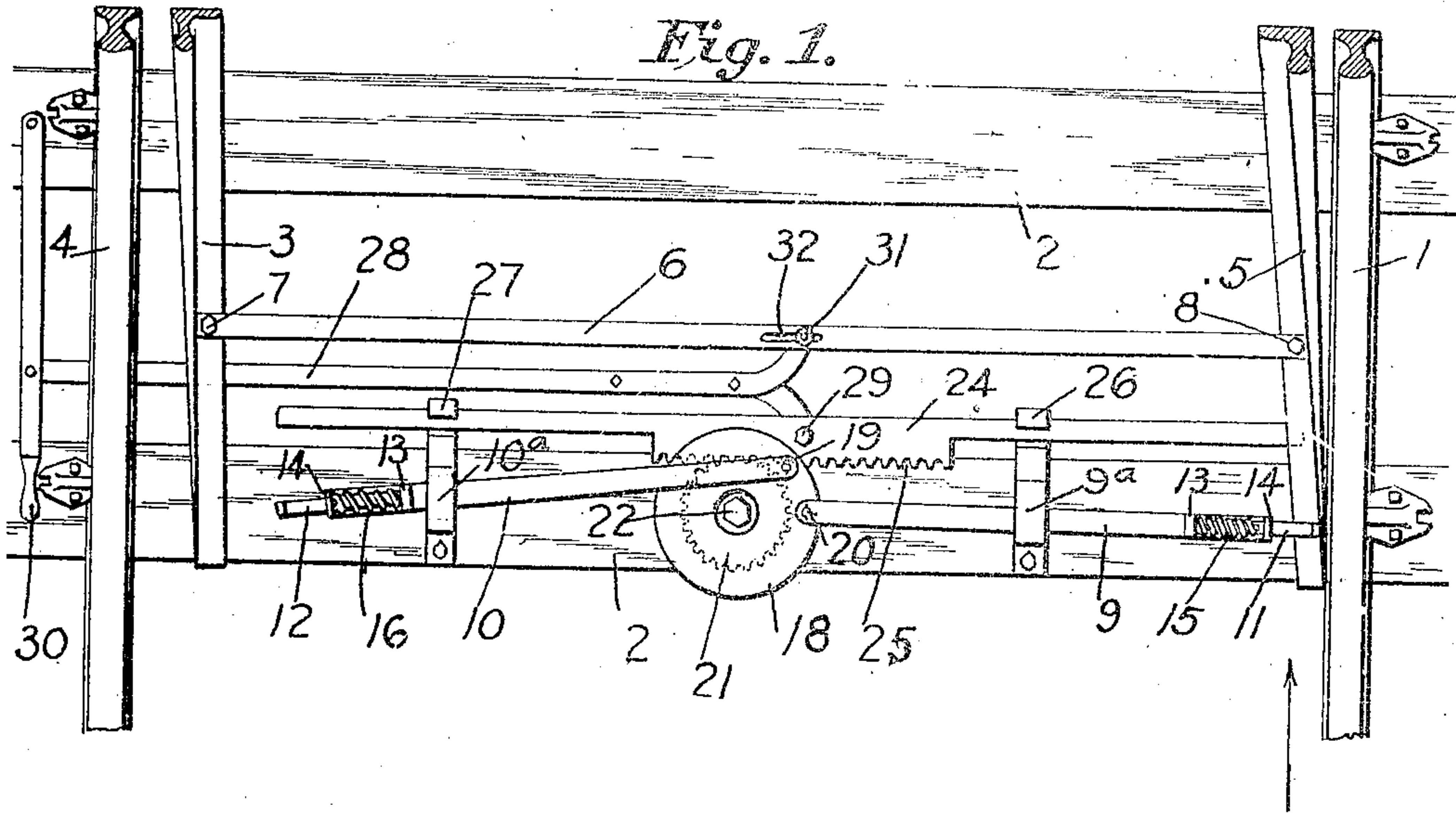


J. O. HALE.
 LOCK FOR RAILWAY SWITCHES.
 APPLICATION FILED JUNE 22, 1908.

924,984.

Patented June 15, 1909.

2 SHEETS—SHEET 1.



WITNESSES
 C. S. Birmingham
 E. J. Ogden

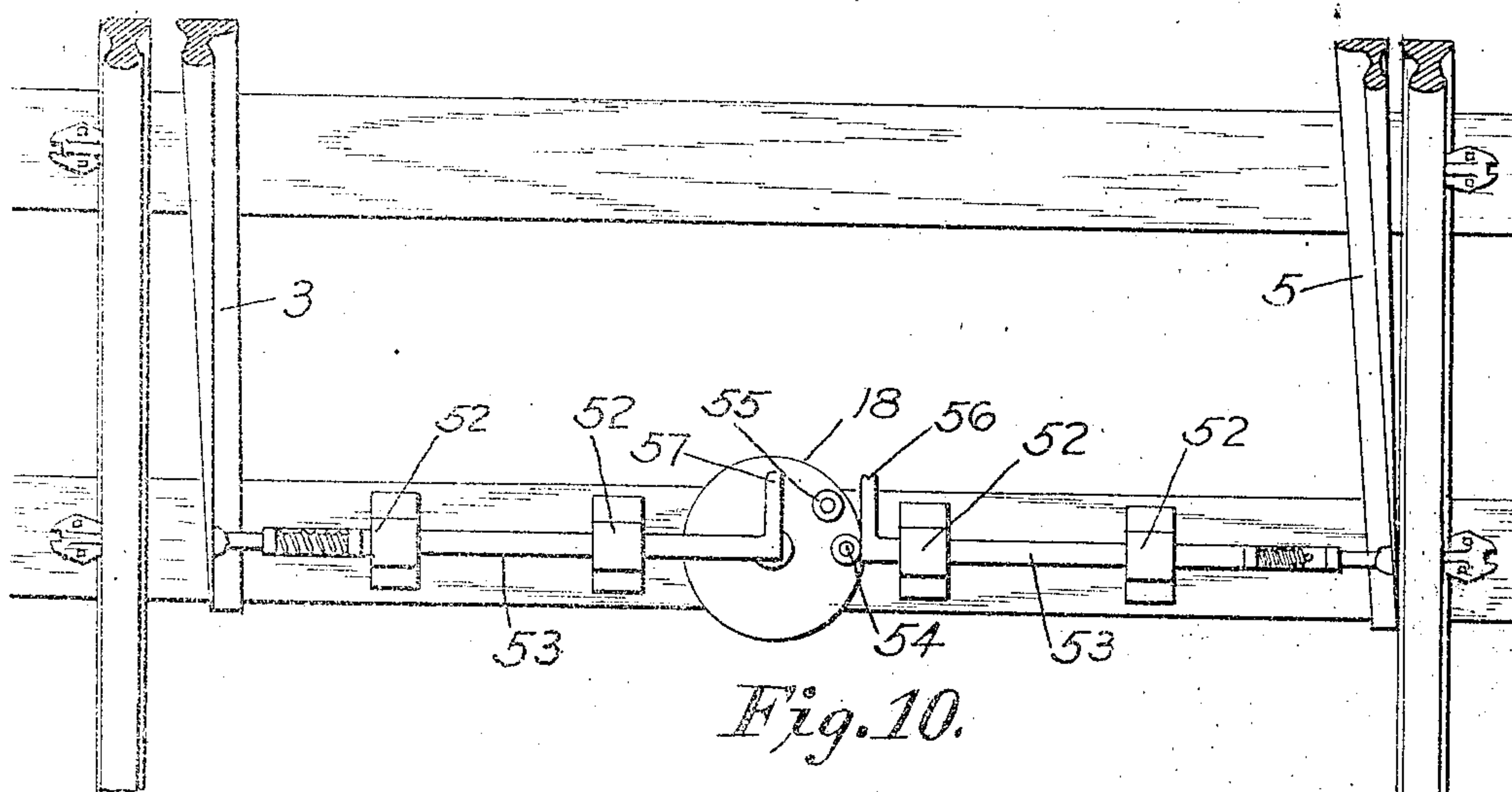
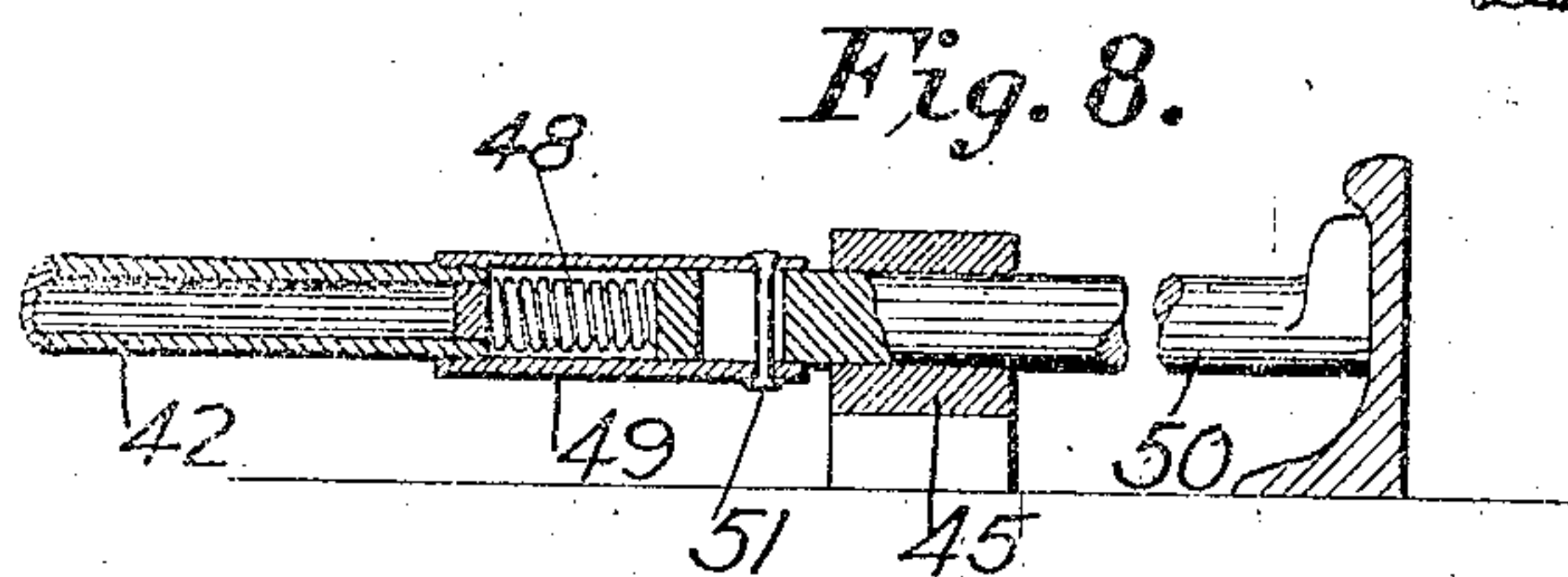
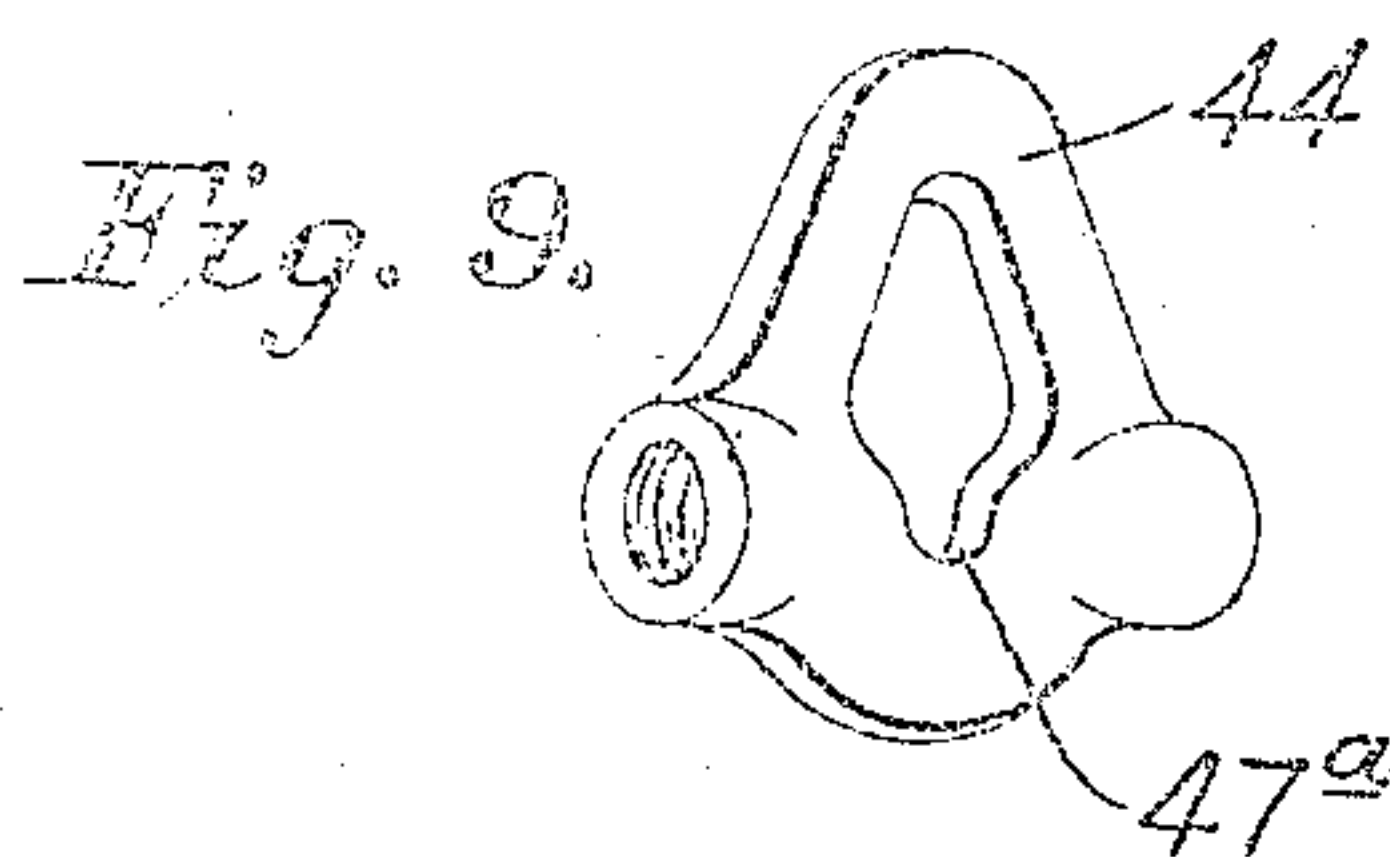
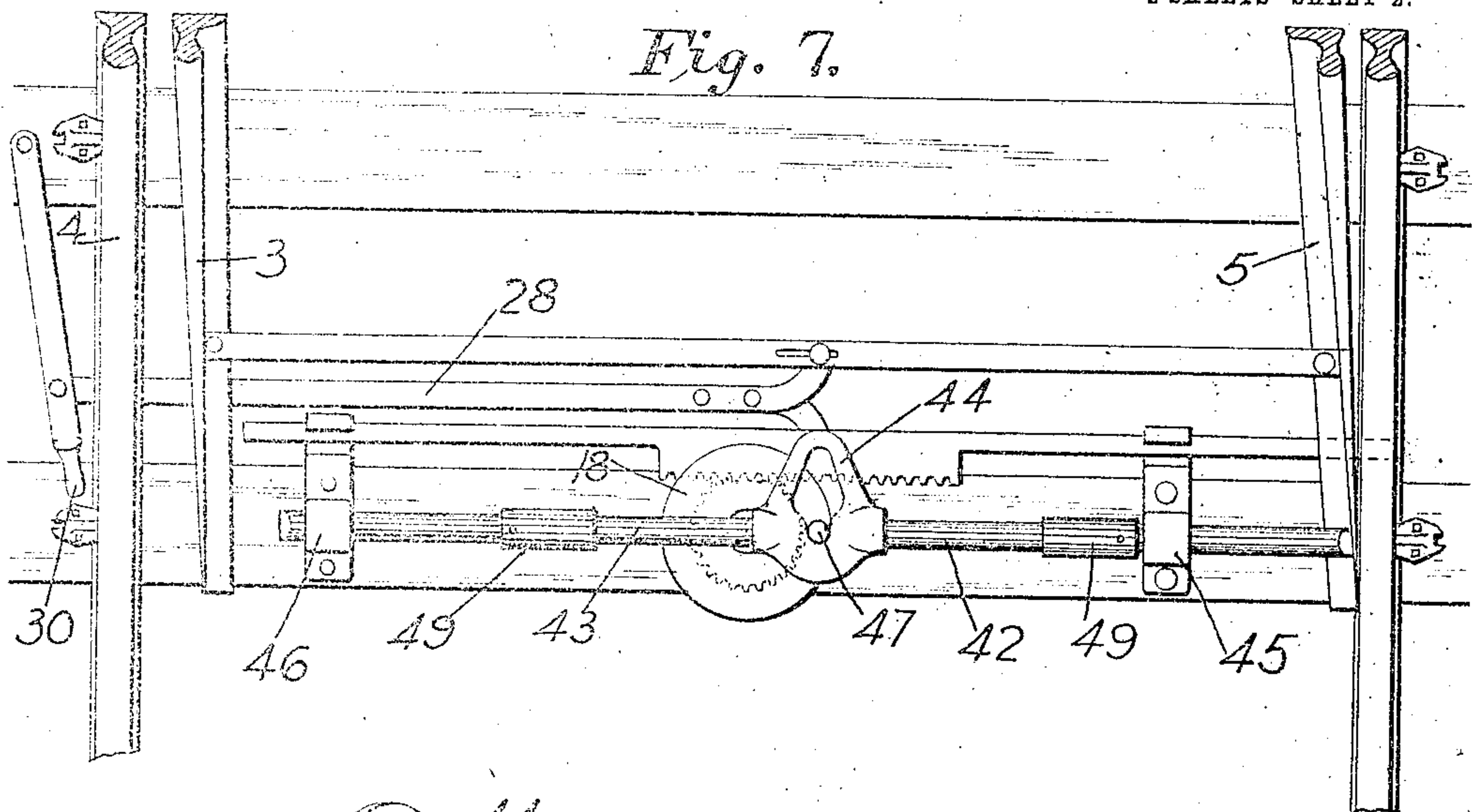
INVENTOR
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN O. HALE, OF WORCESTER, MASSACHUSETTS.

LOCK FOR RAILWAY-SWITCHES.

No. 924,984.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed June 22, 1908. Serial No. 439,710.

To all whom it may concern:

Be it known that I, JOHN O. HALE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Locks for Railway-Switches, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to locks for railway switches, and has for its object to provide simple and effective means to be readily attached to railway switches whereby the split rail may be locked by a spring pressed bar or bolt against working away from the main rail.

15 A further object of the invention is to so construct the locking bolt that when the switch is thrown the trailing points of the same are adapted to yield and be pressed away by a train passing on the track in the opposite direction without permanently disturbing the locked position of the switch.

20 It is found in practice very difficult to prevent bolts from becoming loosened in the mechanism on railroad tracks, on account of the excessive jar and working of the same, owing to the rapid passing of heavy trains, and where the tie rod in a switch becomes slightly loosened it fails to carry or move the switch points into the proper position and often is the cause of derailing the train. In order to obviate this serious difficulty I have provided a spring pressed bar or bolt which operates independent of the tie rod and relieves the same of the responsibility of holding the rail points in position, said bar or bolt being adapted to act against the point of the switch rail to press the same firmly against the main rail and hold the point in that position against any jar or vibration of the passing trains irrespective of any looseness or backlash in the tie rod, or other connections.

25 In the construction of my improved locking device I preferably employ a rack and pinion as it is found that this in practice does away with the bolts, levers and pivoted connections, thus reducing the number of parts that are likely to become loosened and lost, and also lessening the chance of lost motion and displacement of parts which is the immediate cause of many serious accidents.

30 My invention consists broadly in providing a bolt or bar for pressing against and

locking the rail, and of the interposition of spring means between the rail engaging ends and the point where the power is applied in operating the same, whereby a flexible tension is exerted on the rail to hold the same in position.

35 My invention further consists in providing an automatic lock so that the same cannot be disengaged or released by any pressure exerted through the rails, said release being only effected by a movement of the operating handle.

40 An advantage in my improved locking device is that the same may be readily attached to switching devices now in use.

45 With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

50 In the accompanying drawings: Figure 1—is a plan view illustrating my mechanism attached to a switch and set in position to close and lock the switch point and cause the train approaching in the direction of the arrow to take the side track. Fig. 2—is an end view showing the rails, a portion of one of the ties and some of the mechanism in section. Fig. 3—is an enlarged plan view of the disk and pinion. Fig. 4—is an edge view of said disk and pinion showing the pins by which the bolt rods are connected thereto. Fig. 5—is an enlarged view of the outer end of a bolt rod showing the bolt and the spring acting upon the same. Fig. 6—is a modification showing the spring pressed bolt as being carried against the switch point by a circular motion. Fig. 7—is a modification showing the two bolt rods as being rigidly connected whereby they will be moved straight back and forth by means of a pin working in a cam plate. Fig. 8—illustrates another form of spring bolt rod the spring being inclosed within a casing. Fig. 9—is a detail of the cam plate illustrated in Fig. 7. Fig. 10—is another modification whereby the bolt rods are adapted to be pressed outward and locked into engagement with the rail and drawn inward by the return movement of said rail.

55 Referring to the drawings, 1 designates the main track rails which are laid in the customary manner upon the ties or sleepers 2. The switch point 3 when moved against the rail 4 completes the main track allowing the

train to pass over the same, and when the switch point 5 is pressed over against the rail 1 the side track is completed.

In practice the points 3 and 5 are connected by the tie rods 6 by means of bolts 7 and 8. These bolts on account of the constant jarring of the rapidly passing trains become loosened and the tie rod is allowed to have considerable lost motion, and sometimes becomes entirely free at one end, so that when these rail points or ends are moved from one side to the other, by means of said tie rod alone, they are likely not to be carried the full length of their stroke to lie properly up against the rail. To remedy this objectionable and dangerous feature in switches of this character I have provided a pair of bolt rods 9 and 10 adapted to slide loosely endwise through the bearings 9^a 10^a and in the outer ends of these rods are the bolts 11 and 12. These bolts are mounted in the bearings 13—14 at the ends of their respective rods and are pressed outward by springs 15 and 16 until the stop pin 17, (see Fig. 5), engages the bearings 14 and prevents further motion of the bolt. The inner ends of these rods are shown as being pivoted to the rotatable disk plate 18 on the pins 19 and 20. To the underside of this disk is fixed the gear 21 and both are rotatably secured to the tie 2 by means of the screw bolt 22 whose head is preferably flush with the face of said plate, being let into the countersunk portion 23 in the center thereof. A friction plate 21^a is provided and secured to the bottom of the recessed portion 22^a to prevent undue wearing of the tie as the gear rotates thereon.

I do not wish to be restricted to the use of a full gear or pinion as a portion or segment of said pinion is adapted to be operated equally as well by the reciprocating movement of the rack, as said gear is not called upon to make a complete revolution. Neither do I wish to be restricted to a disk or plate 18 attached to the gear, as in some instances this plate may be done away with, if desired, and any suitable or convenient means may be employed for supporting the controlling pins. In order to operate this gear, disk plate and bolt rods, a rack 24 is provided having teeth 25 which mesh with those in the gear, said rack being adapted to be moved endwise in the bearings 26 and 27 by means of the connection 28, which is fastened to said rack by the bolt 29. The outer end of this connection 28 may be manually, mechanically or electrically operated in any desired or practical manner, but for convenience I have shown the simplest form of hand operated lever 30 to illustrate one way by which the same may be operated. The rod 28 is also connected to the tie rod 6 by means of the bolt 31 and is adapted to work in the short slot 32 in said rod whereby when the operating lever 30 is in the act of being

thrown from one side to the other the rack 24 is first moved to rotate the gear and withdraw the lock bolt 11, after which the pin 31 brings up at the end of the slot 32 in the tie rod 6, the point rails are moved into position against the other track, and the lock bolt 12 pressed against said rail to retain it securely in that position, and as the actuating pin 19 is rotated around to the point where the pressure exerted upon the same is in exact line with the center around which the same is moved the bolt rods become automatically locked against any pressure which may be exerted upon the same through the rails and are only adapted to be unlocked and withdrawn through the operation of the actuating lever.

In the modification, as illustrated in Fig. 6, the bolt rod 33 is pivoted at 34 and is adapted to swing in a circular direction against the side of the rail 35 by means of the rack 36 working in the segment 37, whereby when it is desired to throw the switch point 35 from the rail 38 the operating handle 30 is moved toward the rail, and owing to the slot 38^a in the tie rod 39 the rack 36 and segment 37 are first operated to swing the spring actuated bolt 40 out of engagement with the point of said switch after which the connecting bolt 41 brings up at the end of the slot and tie rod and the switch point is then moved to its other position.

Another modification is illustrated in Fig. 7, in which the two bolt rods 42 and 43, instead of being pivoted to the disk plate 18, as illustrated in Fig. 2, are rigidly connected together through the cam plate 44 to work endwise in the bearings 45 and 46, whereby when the disk plate is rotated to shift the switch, as the actuating pin 47 is carried upward and over to the other side, it moves into the irregular opening in the cam shaped portion and carries the bolts and rods straight across to contact with and lock the point rail 3 on the other side. A feature of this construction is that the opening through the cam plate is cut away, whereby as soon as the actuating pin 47 has moved a short distance the rail is unlocked and free to be moved across to the opposite side at a speed independently of that of the movement of the lock bolts, and the last end of the stroke brings said pin again into the narrow slot 47^a setting a strong spring tension against the rail point engaging bolt, and like the construction illustrated in Fig. 1, as the actuating pin 47 is moved around to the point where the pressure exerted upon the same is in exact line with the center around which the same is rotated the bolt rods become automatically locked against any pressure which may be exerted upon them through the rails.

Instead of forming the bolt rods as illustrated in Fig. 5 they may be made as illus-

trated in Fig. 8, if desired, where the springs 48 are on the interior of the sleeves 49 where they are held to press against their respective sliding bolt, the stop or limit pin 51 preventing the bolt from being forced out when the end is free.

Fig. 10 is another modification showing mechanism similar in its action to that illustrated in Fig. 1, but instead of the bolt rods 53 being pivotally connected to the actuating pins on the disk 18 and carried both inward and outward by the movement of said pin, each rod is adapted to be engaged at its upturned end and be simply pressed outward by its respective pin, said rods being returned or drawn inward by the return movement of the rail with which it comes in contact. The disk 18 may be actuated in the manner illustrated in Fig. 1 or by any other convenient means, not shown.

My invention is not restricted to the construction and arrangement of parts herein shown and described, nor to the various details thereof, as any mechanism which may be constructed to operate a bolt or bar and have a spring interposed between the point where said bar contacts with the rail and the point where the power is applied to the bolt will come within the spirit and scope of my invention, one practical embodiment and several modifications of which have been herein shown and illustrated without attempting to show all of the various forms and modifications in which my invention might be embodied.

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

1. A railway switch comprising movable switch points, actuating means therefor, a bolt adapted to engage and lock each of said points, and spring means interposed between the engaging ends of said bolts and said actuating means.

2. A railway switch comprising movable switch points, actuating means therefor, a bolt also moved by said actuating means adapted to engage and lock each of said points, and spring means interposed between the engaging ends of said bolts and said actuating means.

3. In a railway switch, movable switch points, a bolt adapted to engage and lock each of said points, means for locking said bolt against releasement, and spring means interposed between the engaging ends of the bolts and the locking means.

4. In a railway switch, movable switch points, actuating means therefor, a bolt also moved by said actuating means adapted to engage and lock each of said points, means for locking said bolt against releasement, and spring means interposed between the engaging ends of the bolts and the locking means.

5. In a railway switch, movable switch

points, means for engaging and holding said points closed with a flexible tension, actuating means for said engaging means, and means whereby said engaging means can be released from engagement only by a movement of said actuating means.

6. In a railway switch, movable switch points, means for engaging and holding said points closed with a flexible tension, actuating means adapted to operate both said points and said engaging means, and means whereby said engaging means can be released from engagement only by a movement of said actuating means.

7. In a railway switch, movable switch points, spring pressed bolts for firmly holding said points in closed position with a flexible tension, means for locking said bolts against releasement, and means for withdrawing said bolts before the switch is thrown.

8. In a railway switch, movable switch points and actuating means therefor, spring pressed bolts for firmly holding said points in closed position with a flexible tension, means for locking said bolts against releasement, and means including said actuating means for withdrawing said bolts before the switch is thrown.

9. A railway switch comprising movable switch points, actuating means therefor, a bolt also moved by said actuating means adapted to engage and lock each of said points, a rack and pinion through which said bolt is operated, and spring means interposed between the engaging ends of said bolts and said actuating means.

10. In a railway switch, movable switch points, actuating means therefor, a bolt also moved by said actuating means adapted to engage and lock each of said points, a rack and pinion through which said bolt is operated, means for locking said bolt against releasement, and spring means interposed between the engaging ends of the bolts and the locking means.

11. In a railway switch, movable switch points, spring pressed bolts adapted to hold said points in closed position, a rack and oscillatory toothed member, and means operated by said member for controlling the movement of said bolts.

12. In a railway switch, movable switch points, spring pressed bolts adapted to hold said points in closed position, a rack and oscillatory toothed member, means operated by said member for controlling the movement of said bolts, and means whereby said controlling means is automatically locked against releasement from pressure on the rails.

13. In a railway switch, movable switch points, spring pressed bolts adapted to hold said points in closed position, a rack and oscillatory toothed member, means operated

by said member for controlling the movement of said bolts, means whereby said controlling means is automatically locked against releasement from pressure on the rails, and means including said bolt spring whereby said locked rail point may yield temporarily and allow a train to pass by in the direction of the trailing point of the switch.

10 14. In a railway switch, movable switch points, spring pressed bolts adapted to hold said points in closed position, and a pin adapted to be moved in a circular direction from one side of a center to the other for
15 controlling the movement of said bolts.

15. In a railway switch, movable switch points, spring pressed bolts adapted to hold said points in closed position, a rack and oscillatory toothed member, and a pin adapted
20 to be moved about the pivoting point of said member for controlling the movement of said bolts.

16. In a railway switch, movable switch points, a tie rod for said points, a spring
25 pressed bolt for each point, means for locking the same to hold the points in closed position, a rack and pinion through which said bolts are operated, a rod connected to both

said rack and said tie rod, and means whereby a movement of said connection will first
unlock the points and then move the same. 30

17. In a railway switch, movable switch points, a tie rod for said points, a spring pressed bolt for each point, actuating pins for moving said bolts, a rack and pinion for
35 rotating said pins about a common center, a rod connected to both said rack and said tie rod, and means whereby a movement of said connection will first release the points and then move the same. 40

18. In a railway switch, movable switch points, a tie rod for said points, said rod being provided with a slot, a spring pressed bolt for each point, actuating pins for moving
45 said bolts, a rack and pinion for rotating said pins about a common center, a rod connected to said rack and to said slotted portion in said tie rod whereby a movement of said connection will be first effected to release the points and then to move the same. 50

In testimony whereof I affix my signature in presence of two witnesses.

JOHN O. HALE.

Witnesses:

HOWARD E. BARLOW,
E. I. OGDEN.