

No. 658,388.

Patented Sept. 25, 1900.

E. MOORE.

MECHANISM FOR IMPARTING SUCCESSIVE OR ALTERNATING MOVEMENTS.

(Application filed Nov. 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 3.

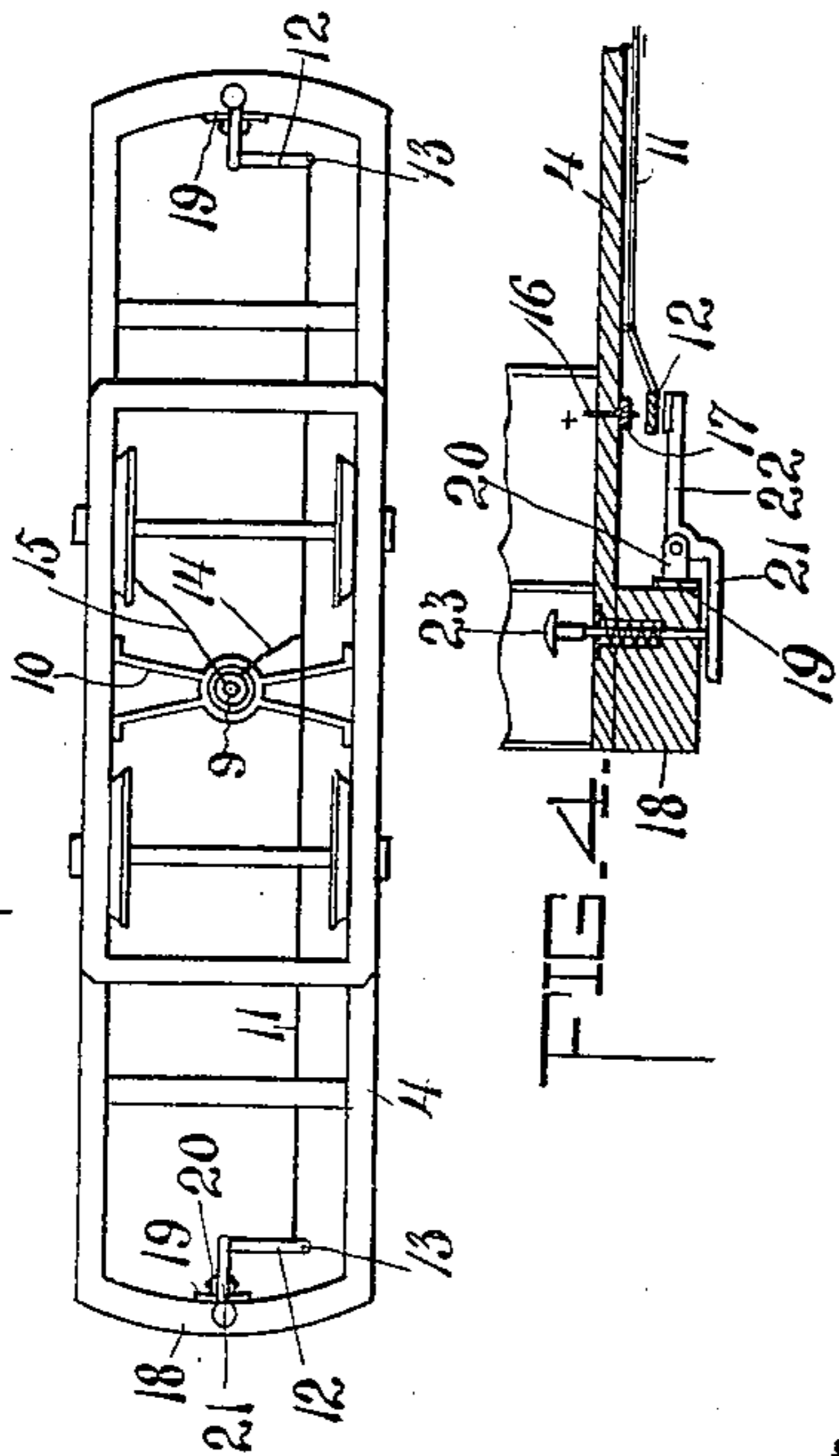


FIG. 4.

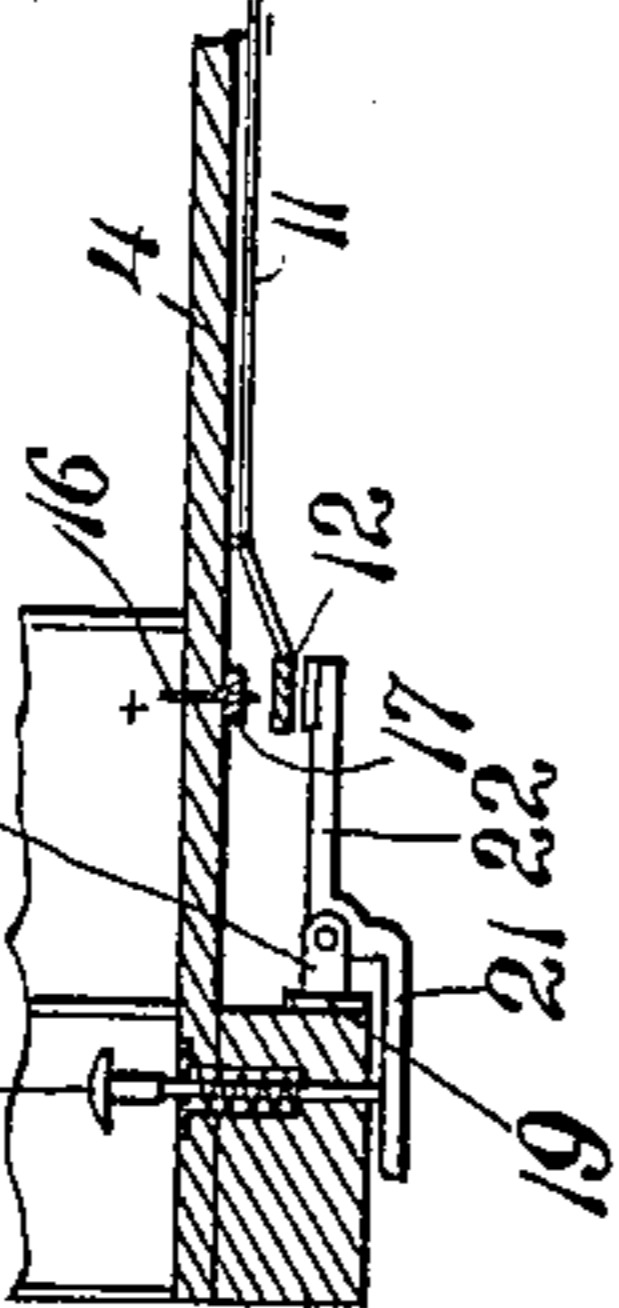


FIG. 1.

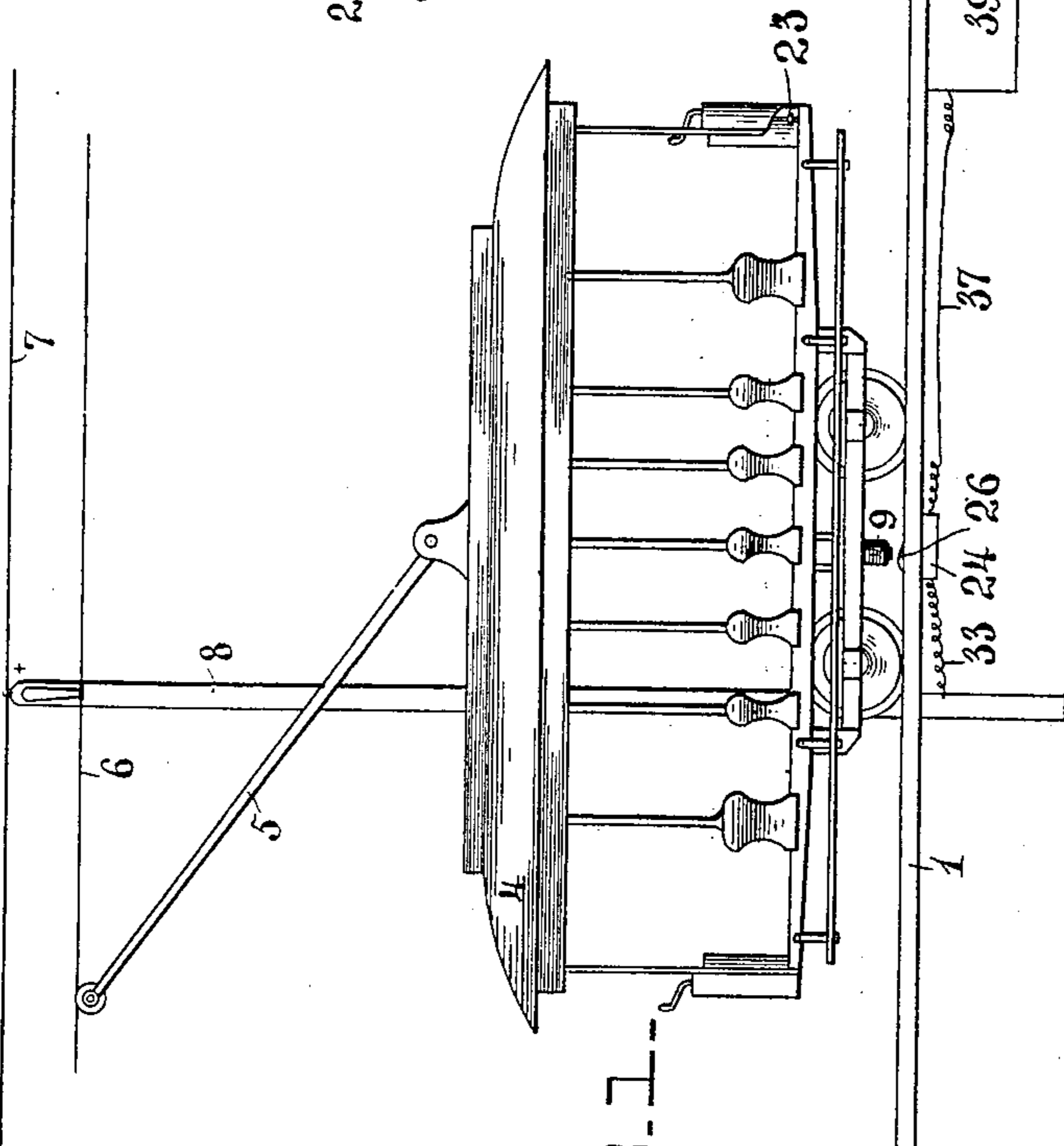
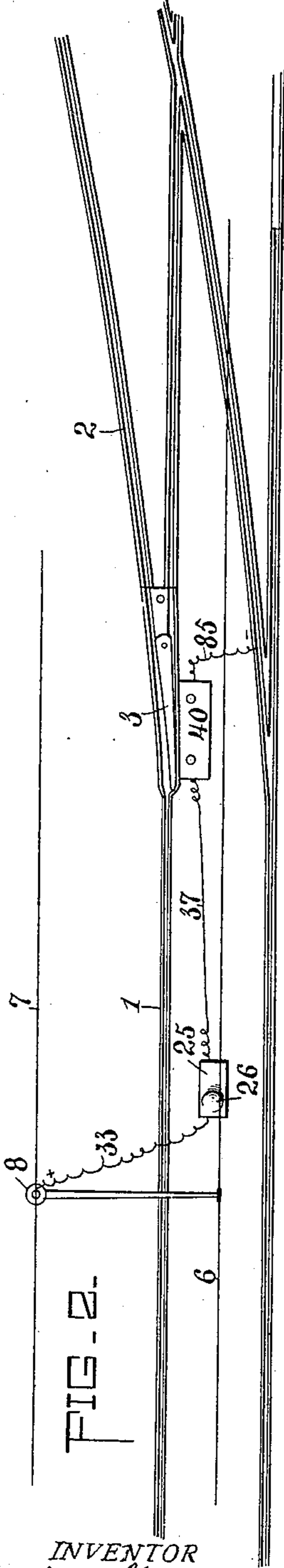


FIG. 2.



WITNESSES

W. E. Allen
Harry A. Knight

INVENTOR

Elisha Moore.
By Knight Bros
Attorneys.

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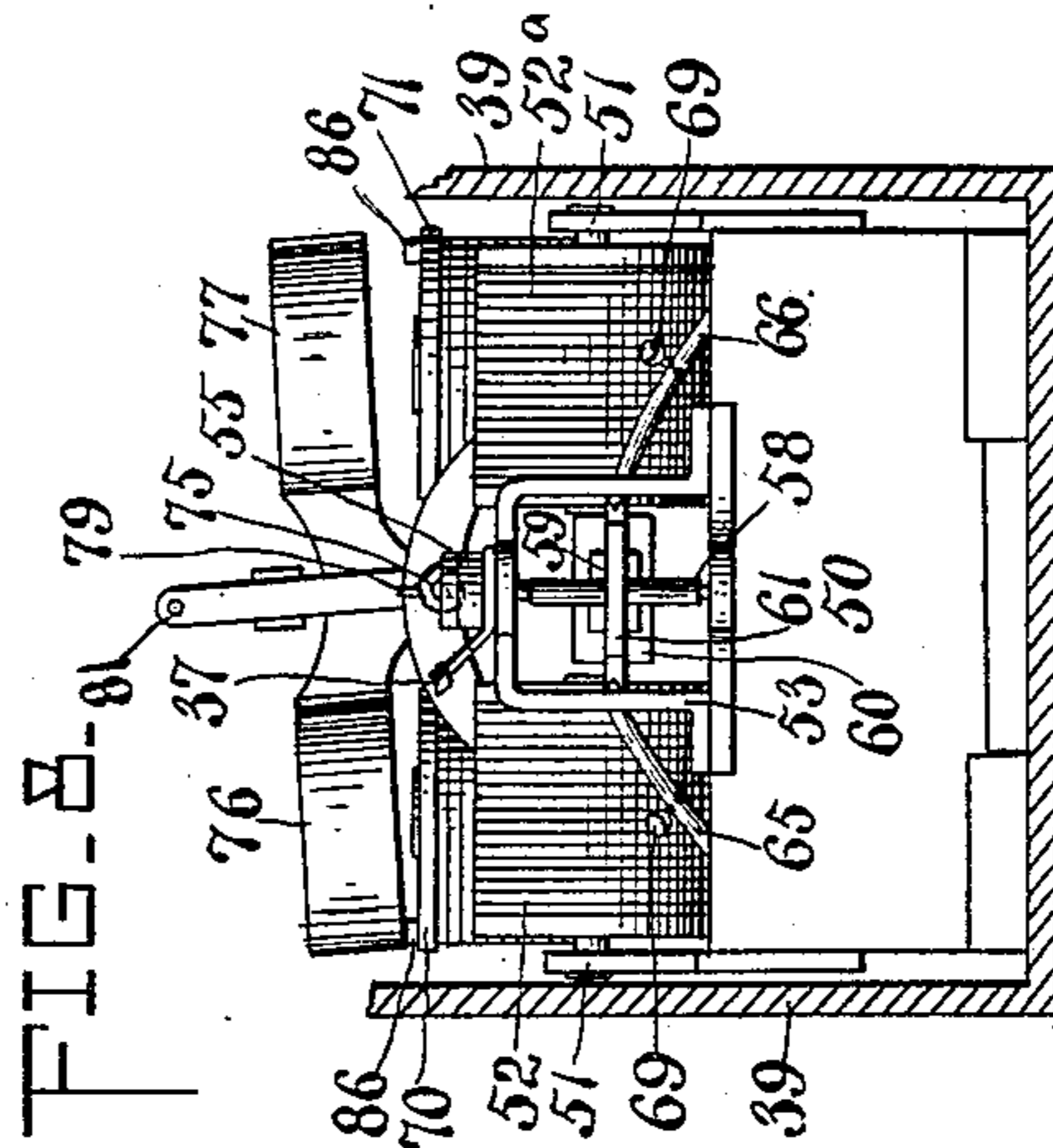
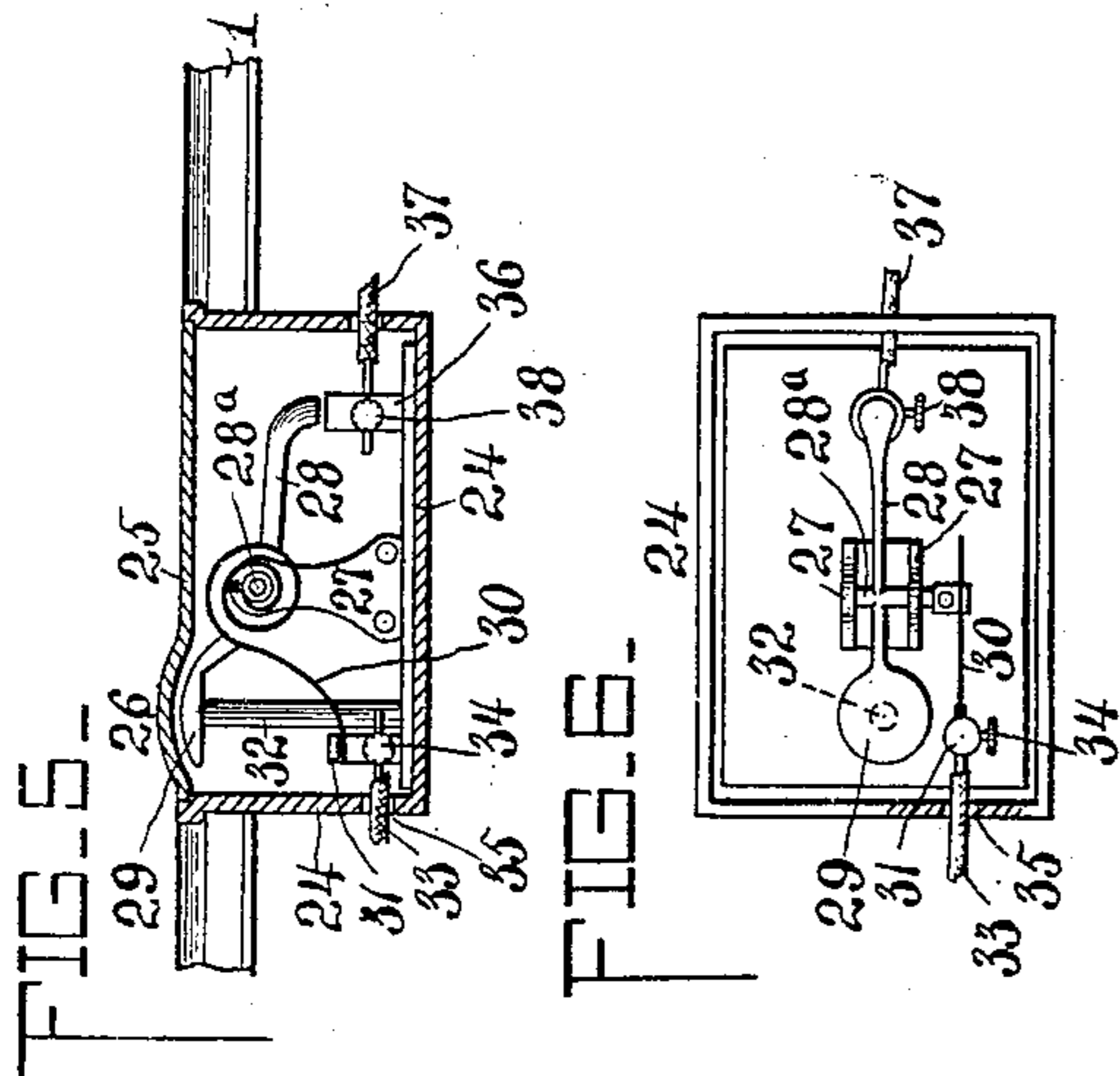
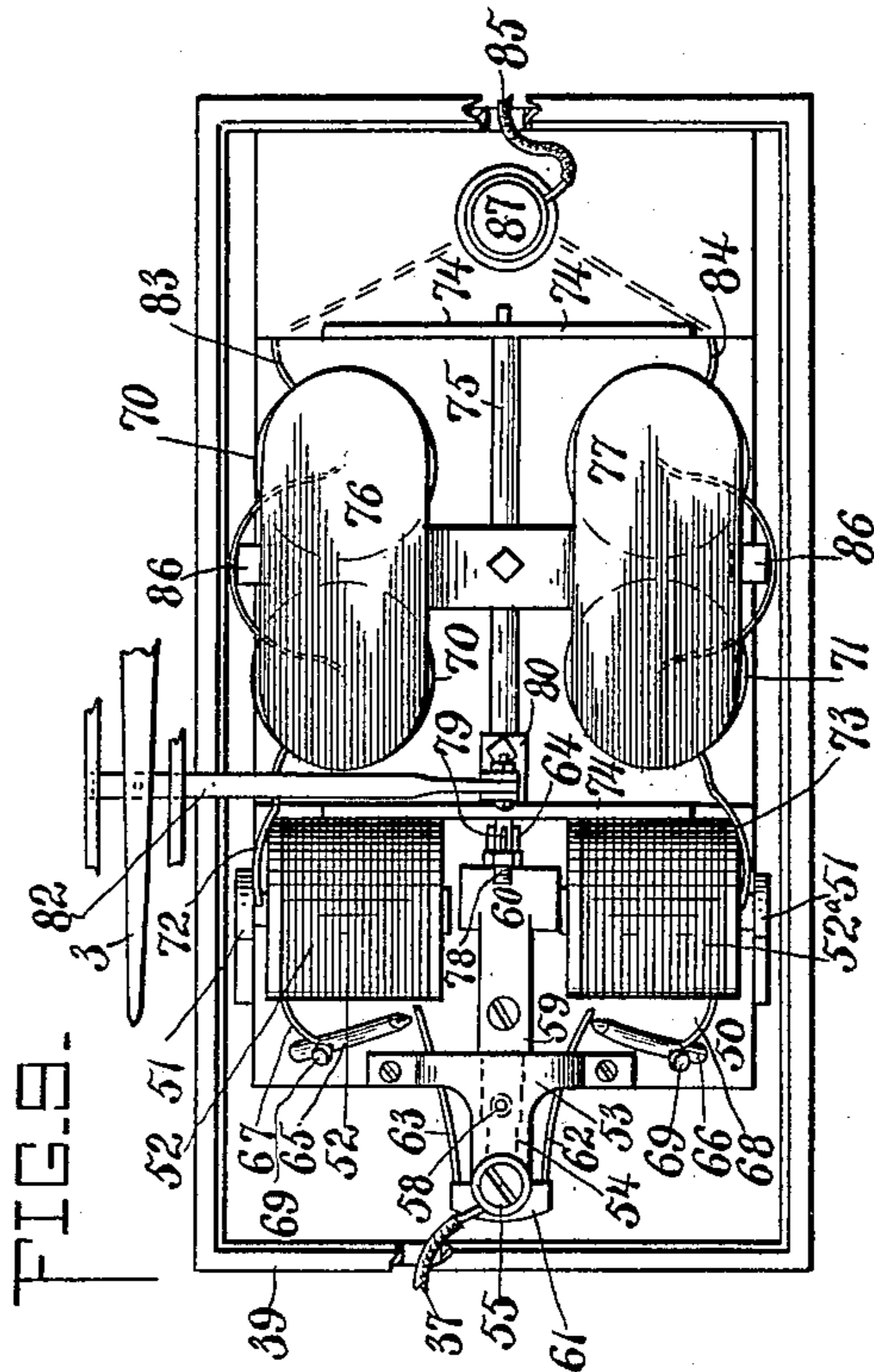
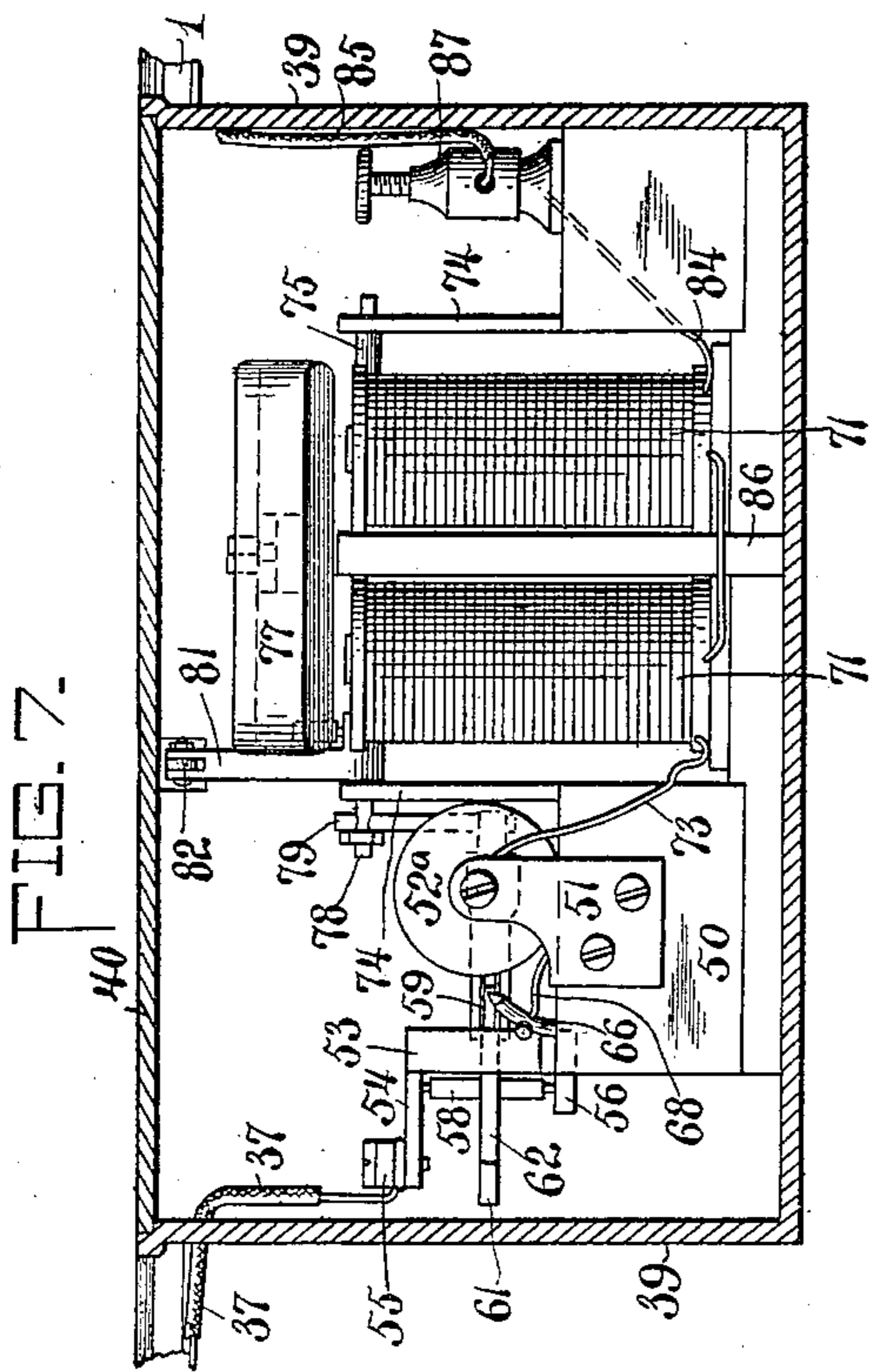
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W. L. Allen
Harry A. Knight

INVENTOR

Elisha Moore.

By

Knight Bros.
Attorneys.

UNITED STATES PATENT OFFICE.

ELISHA MOORE, OF MEDUCTIC, CANADA.

MECHANISM FOR IMPARTING SUCCESSIVE OR ALTERNATING MOVEMENTS.

SPECIFICATION forming part of Letters Patent No. 658,388, dated September 25, 1900.

Application filed November 15, 1899. Serial No. 737,094. (No model.)

To all whom it may concern:

Be it known that I, ELISHA MOORE, a subject of the Queen of Great Britain, and a resident of Meductic, in the county of York, Province of New Brunswick, and Dominion of Canada, have invented certain new and useful Improvements in Mechanism for Imparting Successive or Alternating Movements, of which the following is a specification.

10 My invention relates to electrically-operated tramway-switches; and it consists in means whereby the current is alternately shifted to operate the switch-tongue, the object of the invention being to construct a
15 switch that is positive in action, simple, cheap, and effective; and with these objects in view my invention consists of the parts and combination of parts, as will be more fully hereinafter set forth.

20 In the drawings, Figure 1 is an outline view of my invention with a car in position. Fig. 2 is a top plan view of the same. Fig. 3 is a bottom view of a car wired according to my invention. Fig. 4 is a detail sectional view
25 of foot circuit-closer. Fig. 5 is a vertical section view of contact-box and inclosed parts. Fig. 6 is a top plan view of the same. Fig. 7 is a vertical view of a box located opposite the switch, showing the switch-operating
30 mechanism. Fig. 8 is an end elevation of the switch-operating mechanism, the box being broken away. Fig. 9 is a top plan view of the same, showing connection with the switch-tongue.

35 1 represents the main track, 2 the switch-track, and 3 the switch-tongue, all of approved construction.

4 is a car shown as being operated by the overhead system through the trolley 5 and
40 wire 6.

7 is the usual feed-wire, and 8 the usual pole to support the wires.

9 is a suitable magnet secured underneath the car in a suitable frame 10.

45 11 is an insulated wire secured underneath the car, each end of which is connected with a contact spring-plate 12, one end of which is firmly secured to the bottom of the car at 13.

50 14 is a conductor-wire leading from the wire 11 to the magnet 9, and 15 is a grounding-wire leading from the magnet to a suitable

part of the car-truck. (Shown in the drawings as the wheel.)

16 is the main feed-wire leading to contact-plate 17 underneath the car. 55

18 is the bolster on the end of the car-platform, to the inner side of which is secured a plate 19, from which extend perforated lugs or ears 20, between which is pivoted the lever 21, from which the arm 22 extends forwardly under the free end of the contact-spring 12. 60

23 is a foot-button from which depends a rod through an opening in the bolster 18 to the top of the lever 21, as clearly shown in Fig. 4. 65

24 is an iron box secured about midway between the rails 1 the necessary distance in advance of the switch-tongue 3, said box being provided with a non-magnetic cover 25, near one end of which is formed a projection 26. The cover is preferably secured watertight to the box. 70

27 are uprights or posts extending from the bottom of the box 24 and secured thereto. 75

28 is a contact-arm having pivot-points or trunnions 29, by means of which it is pivoted between the uprights or standards 27.

29 is a rearward extension from the arm 28, which rests in position immediately under the projection 26 of the cover 25. 80

30 is a spring one end of which is coiled around and secured to one of the trunnions 29 of the arm 28, while the other end of said spring is secured to the stud or post 31, extending upwardly from the bottom of the box. 85

32 is a stop extending upwardly from the body of the box under the rearward extension 29 of the arm 28 to limit the downward movement of said extension. 90

33 is a feed-wire leading from the main feed-wire of the system and secured to the post 31 by means of the set-screw 34, said wire passing through the opening 35 in one end of the box, where it is properly insulated, and said opening made as near as possible waterproof. 95

36 is a binding-post extending upwardly from the bottom of the box 24 under the forward end of the contact-arm 28, and 37 is a conductor secured to said post by means of binding-screw 38. 100

39 is a water-tight box located between the

rails and immediately against the fork of the switch, as clearly shown in Fig. 2, and 40 is the cover thereof.

50 is a base-block secured in the bottom of the box 39, to each end of which is secured an upwardly-extending bracket 51.

52 and 52^a are magnets secured, respectively, in a horizontal position to the brackets 51, which magnets, with their connections, will be referred to in the claims as the "relay."

53 is a U-shaped strap secured to the base-piece 50, provided with a rearwardly-extending arm 54, upon which is mounted a binding-post 55, the conductor 37 being secured in the usual manner to said binding-post.

56 is a projection extending from the front face of the base 50 and provided with a pivoted bearing. The rearwardly-extending arm 54 of the strap 53 is provided with a pivoted bearing.

58 is an axle upon each end of which is formed a pivot adapted to work, respectively, in the pivot-bearings just referred to.

59 is an arm rigidly secured in the center and carried by the axle 58, the forward end of said arm being provided with the armature 60, adapted to cooperate with the magnets 52 and 52^a. The other end of the arm 59 is provided with a head 61, from each end of which extend outwardly-curved flat springs 62 and 63, said springs passing beneath and beyond the U-shaped strap 53.

64 is a forked projection extending from the forward end of the arm 59 beyond the armature 60.

65 and 66 are contact-points secured to and extending upwardly from the base 50, with which the springs 62 and 63 are adapted to contact.

67 and 68 are conductors leading from the contacts 65 and 66 to the magnets 52 and 52^a, said conductors being secured to the contact-points by means of suitable binding-posts 69.

70 and 71 are magnets suitably secured within a box 39 and connected with the magnets 52 and 52^a, respectively, by means of the conductors 72 and 73.

74 represents standards secured to the bottom of the box, in the center of which is pivoted the rod 75, upon which is rigidly secured the armatures 76 and 77.

78 is a lateral extension integral with the rod 75, to which is secured a flat spring 79, the lower end of said spring being secured in the forked projection 63 of the arm 59.

80 is a collar secured to the rod 75 by said screw with an upwardly-extending arm 81 integral with said collar, having a split or forked end in which is pivoted one end of a shifting rod 82, said rod extending through one side of the box 39 and rigidly connected to the switch-tongue 3, as clearly shown in Fig. 9.

82 is a binding-post, and 83 and 84 are conductors leading from the magnets 70 and 71 to said binding-post.

85 is a conductor leading from the binding-post 82 to the rail 1 of the system.

86 is a stop extending upward from the bottom of the box to the point slightly above the core of the magnet, against which the armatures 76 and 77 strike, thereby preventing the armatures from coming in direct contact with the cores of said magnets, thus preventing the cores from retaining magnetism.

The operation is as follows: The system being in operation and the conductor 33 being properly connected up to the main feed-wire, as a car approaches the switch it must first pass the box 24. Just before the car reaches the box 24 the motorman depresses the button 25 with his foot, thereby depressing the lever 2 and forcing the arm 22 upward into engagement with the contact-spring 12, and a continued pressure forces said contact-spring in engagement with the feed-wire 16, thereby connecting the wire or conductor 11 with the trolley-feed and through the connection 13 energizing the magnet 9. The parts being in this position, as soon as the magnet is immediately over the projection 26 on the cover 25 of the box 24 the rearward extension 29 is drawn upward, thereby throwing the contact-arm 28 down into contact with the contact-post 36, thus closing the circuit through the spring 30 between the wires or conductors 33 and 37. The current passes along the conductor 37 to the binding-post 55, through the spring 62 to the contact 66, from which it passes through the wire 68 to the magnet 52^a and through the wire 73 to the magnets 71, thereby simultaneously attracting the armature 60 to the magnet 52^a and the armature 77 to the magnet 71, from which the current passes through the conductors 84 and 85 to the rail. When the armature 77 is drawn downward to the magnet 71, the rod or shaft 75 is rocked, thus drawing the shifting bar 82 by means of the arm 81 inward and throwing the switch-tongue in a position shown in Fig. 2. As the next car approaches box 24 and the motorman desires to continue on the main line the foot-button 23 is depressed and the mechanism operated as heretofore described, with the exception that in this instance the current passes through the contact-spring 63, contact-point and wire 65 and 67 into the magnets 52 and 70, whereupon the armatures 60 and 76 are attracted and drawn to these magnets and the shifting bar 82 thrown in the opposite direction, thus throwing the switch for the main track, the current passing to the rail, as described. It will be noted that as soon as the contact is broken and the current passed to the rail the spring 79, working in the forked projection 64, throws the armature 60 over against the opposite magnet, ready for the next impulse.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a shifting member, of armatures, a common axis for said armatures connected with the shifting member,

magnets for said armature and a relay having an armature common to both of its magnets interposed in the circuit between the magnets and source of supply.

5 2. The combination with a shifting member, of armatures, a common axis for said armatures connected to the said member, magnets for said armature, a relay having an armature common to both of its magnets and a
10 make-and-break contact interposed in the circuit between the magnet and the source of supply.

3. The combination with a shifting member, of armatures, a common axis for said armatures connected to said shifting member, magnets for the armatures, a relay having an armature common to both of its magnets, a make-and-break contact interposed in the circuit between the said magnets and source of
20 supply, and means to operate the same contact.

4. The combination with a shifting member, armatures, a common axis for said armatures connected with the said member, magnets for the armatures, of a relay having
25 an armature common to both of its magnets and make-and-break contact interposed in the circuit between the said magnets and source of supply and a magnet to operate said contact.

5. In a device of the character described,
30 the combination with the magnets armatures and a common axis for said armatures, of a relay having an armature common to both of its magnets and means connecting the axis of the armatures and the relay to automatically
35 shift the relay.

6. In a device of the character described, the combination with the magnets and pivoted armatures for said magnets of a relay and a flat spring connecting the armature of
40 the relay with the axis of the said pivoted armatures to automatically shift the relay.

7. The combination with the magnets, ar-

matures for said magnets mounted on a common axis, and a shifting member, of a relay comprising two magnets, a common arma- 45 ture, contact-springs mounted on the arm of the armature, contact-points connected with the last-named magnets with which the said springs alternately contact and a flat spring connecting the armature of the relay with the
50 axis of the first-named magnets.

8. The combination with a shifting member, of two magnets, armatures for the same mounted on a common axis, a relay connected with said magnets, a resilient connection 55 between the said axis and the armature of the relay, a make-and-break contact and a magnet mounted upon a car to operate the said contact.

9. The combination with a shifting mem- 60 ber, two magnets, armatures for the same mounted on a common axis, a flat spring secured to one end of said axis, of a relay having an armature common to both of its magnets, and a forked projection extending from 65 the end of the armature adapted to engage the flat spring secured to said axes.

10. The combination with the magnets, armatures for the same mounted upon a common axis, a shifting member connected with 70 said axis, a relay comprising two magnets, an arm, an armature common to both magnets mounted upon said arm, contact-points connected with the magnets, flat springs extending from each side of the arm adapted to al- 75 ternately contact with said contact-points, and a make-and-break contact-lever, a coiled spring connecting the same with the source of supply.

ELISHA MOORE.

Witnesses:

H. S. KNIGHT,
EDWIN S. CLARKSON.