

No. 749,835.

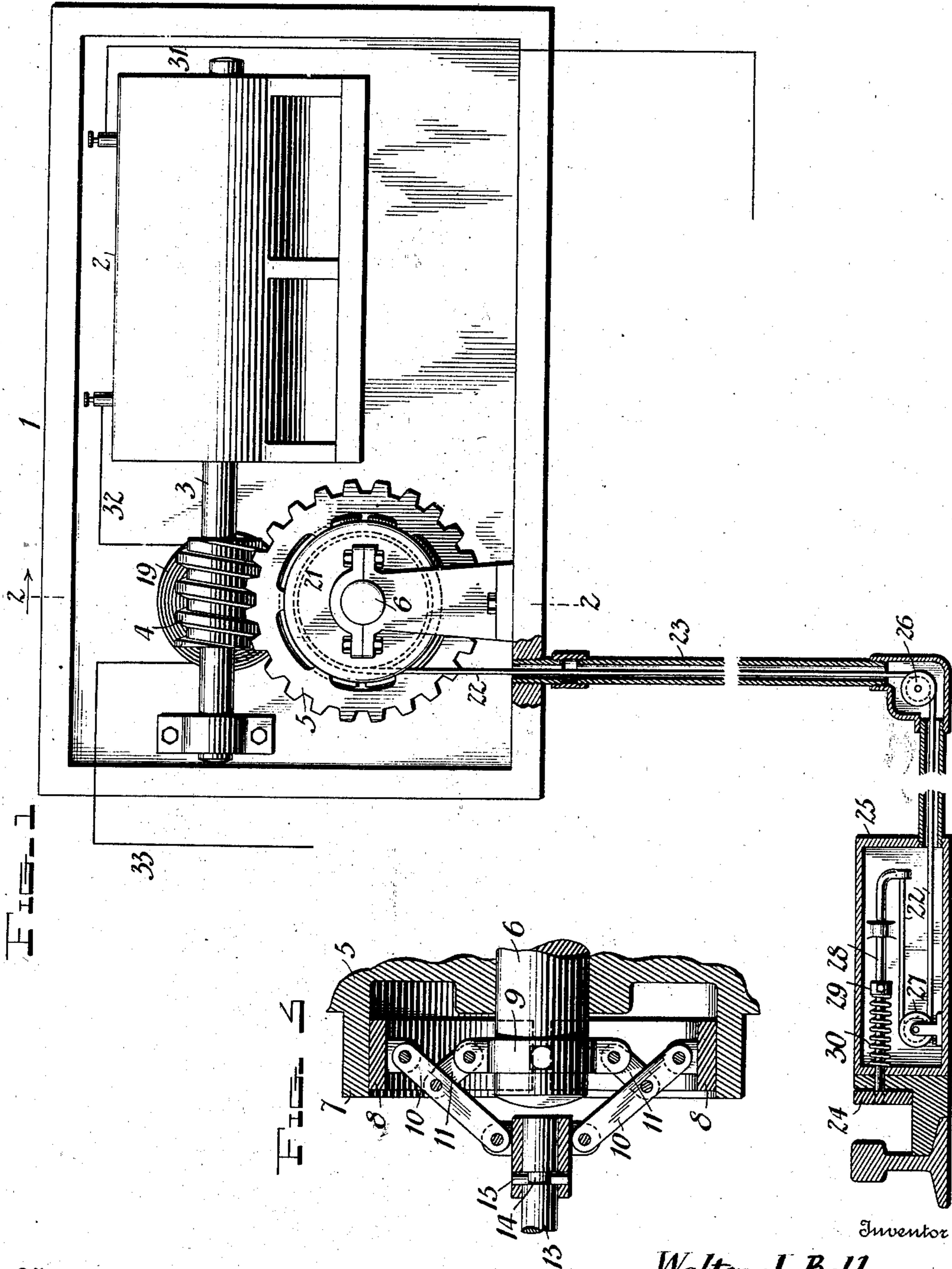
PATENTED JAN. 19, 1904.

W. J. BELL.
ELECTROMECHANICAL SWITCHING MECHANISM.

APPLICATION FILED MAY 29, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
W. J. Bell
W. J. Bell

Walter J. Bell,
W. J. Bell
his Attorneys

No. 749,835.

PATENTED JAN. 19, 1904.

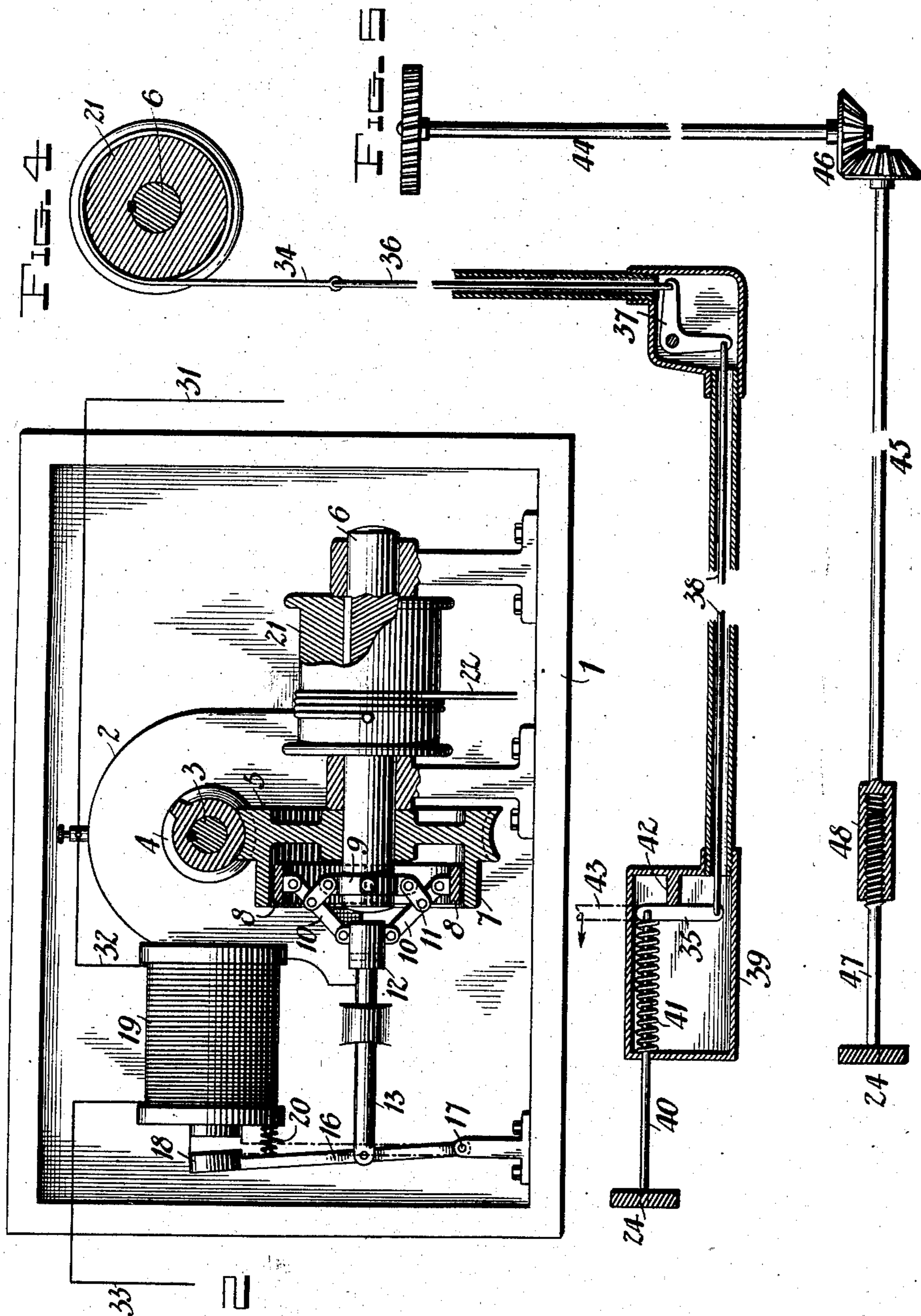
W. J. BELL.

ELECTROMECHANICAL SWITCHING MECHANISM.

APPLICATION FILED MAY 29, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Inventor

Walter J. Bell,

By

W. J. Bell

his Attorneys

Witnesses

J. H. Bell
W. J. Bell

UNITED STATES PATENT OFFICE.

WALTER J. BELL, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO LEON F. MOSS, OF LOS ANGELES, CALIFORNIA.

ELECTROMECHANICAL SWITCHING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 749,835, dated January 19, 1904.

Application filed May 29, 1903. Serial No. 159,268. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. BELL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles, and State of California, have invented certain new and useful Improvements in Electromechanical Switching Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to switching mechanism more especially designed for employment in connection with street-railways, either underground, surface, or elevated, and contemplates a motor-operated organism, including a clutch, for operating the switching element and electrical means for controlling such operation more particularly from the car or train. In the accompanying drawings and following description is set forth a switching mechanism capable of carrying my invention into effect; but from the wording of the concluding claims it will be obvious that I do not intend such specific disclosure to be regarded as any limitation, but desire to include all modifications which come within the broadest of the definitions of the invention.

Referring to the drawings, Figure 1 is an elevation, partly in section, of a switching mechanism embodying my invention. Fig. 2 is a vertical sectional view on line 2-2 of Fig. 1. Fig. 3 is an enlarged sectional view of the clutch with the members in engagement. Figs. 4 and 5 are views showing modifications of the switch-tongue-throwing means.

In the drawings, 1 designates a casing, in which is supported an actuator 2, preferably an electric motor. On the shaft 3 of the motor is fixed a worm 4 in mesh with a worm gear-wheel 5, loose on a shaft 6. On the wheel 5 is an annular flange 7, constituting one member of a friction-clutch. The other member of the clutch consists of a divided ring 8, the sections of which are movably supported from the shaft 6, with which they rotate, by a collar 9, fixed to the shaft, levers 10 10, pivoted at one end to ears on the ring-sections, and links 11 11 affording flexible connections

between the levers and ears on the collar. The other ends of the levers are pivotally connected to ears on a sleeve 12, rotatable on a rod 13, but movable with the latter, an annular groove 14 in the rod being engaged by pins 15, carried by the sleeve. The outer end of the rod is pivoted to a lever 16, fulcrumed at 17 and carrying at its free end an armature 18, normally in juxtaposed relation to the pole-piece of an electromagnet 19. A coiled spring 20, interposed between the armature lever and magnet, retracts said lever to the position shown in full lines in Fig. 2.

On the shaft 6 is keyed a drum 21, and 22 is a cable or chain wound at one end about the drum and passing through an opening in the casing and through an inclosing tube 23. At the switch-tongue 24 is a box 25, into which the cable or chain leads after passing around a sheave 26 in the tube 23. The cable or chain is also passed around a sheave 27 in the box 25, after which it is attached to the inner bent end of a rod 28, slidably supported in the box and connected at its other end with the switch-tongue. Coiled about the rod and interposed between the front box-wall and a tension-regulating collar 29 is a switch-tongue-retracting spring 30.

31 is a feed-wire leading to one binding-post of the electric motor 2, and a wire 32 leads from the other motor-post to the coils of the magnet 19. 33 is a wire leading from said coils to ground.

In operation an operating-circuit is established through contact, for example, between the trolley-wheel of the car or train and an insulated section of the trolley-wire or rail and current passing to the motor motion is imparted to the worm 4 and gear-wheel 5. The current also passes by the wire 32 to the magnet 19 and energizes the latter, causing the attraction of the armature 18 and the movement of the lever 16 to force the rod 13 inwardly and expand the clutch member 8 against the clutch member 7. The clutch member 8 being fixed to the shaft 6 the latter and drum are set in motion to effect the winding of the cable or chain and the throw of the switch-tongue, as will be understood. After

the car or train has traversed the switch the circuit is interrupted, for example, by a circuit-breaker in the trolley-wire, and the springs 20 and 30 operate to retract the parts 5 for the next operation.

In Fig. 4 is illustrated a construction of switch-throwing means comprised of the drum 21 and a short cable 34, wound thereon and connected with one end of a switch-throwing 10 lever 35 by a rod 36, a bell-crank lever 37, and a rod 38. The lever 35 is arranged in a box 39 and is connected at its opposite end with the switch-tongue through the medium of a rod 40, having a retracting-spring 41. 15 Extending from the rear wall of the box is a fulcrum-piece 42, which provides the fulcrum for the lever in the operation of the switch-tongue by the rotation of the drum. To permit free hand-switching of the tongue, the 20 lever 35 may be extended, as indicated at 43, to provide a handle, which is moved in the direction shown by the arrow to throw the tongue without disturbing the automatic means.

Fig. 5 shows a construction for moving the switch-tongue comprised of rotatable shafts 44 45, connected by beveled gearing 46, a threaded rod 47, carried by the tongue, and an internally-threaded head 48 on the shaft 45. 30 Obviously the rods 44 45 are rotated in one direction to throw the switch-tongue and are reversely rotated to retract said tongue.

I claim as my invention—

1. In a switching mechanism, a motor-operated member, a switch element, a member 35 connected with the switch element, to move the latter, a clutch between the members, an electromagnet, and an armature connected with the clutch and arranged to be moved by 40 said magnet.

2. In a switching mechanism, an electric-motor-operated member, a switch element, a member connected with the switch element to move the latter, a friction-clutch between the 45 members, an electromagnet, and a spring-retracted armature connected with the clutch and arranged to be moved by said magnet.

3. In a switching mechanism, an electric motor, a shaft, a gear member fixed to the 50 motor-shaft, a gear member loose on the first-

named shaft, an electromagnet, an armature, a clutch member on the last-named gear member, a clutch member fixed to the first-named shaft and connected with the armature, a switch-tongue, and means connecting the 55 tongue and the first-named shaft.

4. In a switching mechanism, a motor-operated gear member, a shaft, a gear member loose on said shaft and meshing with the afore-said gear member and provided with a clutch 60 member, a second clutch member fixed to the shaft, an armature operatively connected with the second clutch member, a spring-retracted switch-tongue, a drum on the shaft, and connecting means between the drum and tongue 65 including a chain or cable.

5. In a switching mechanism, a motor-operated worm, a shaft carrying a drum, a worm gear-wheel loose on the shaft and meshing with the worm, a friction-ring on said wheel, 70 a ring fixed to the shaft and composed of sections expandible to engage said ring, a spring-retracted lever connected with the expandible ring, an armature on said lever, a magnet arranged to attract the armature, a spring-retracted switch-tongue, and connecting means 75 between the drum and tongue.

6. In a switching mechanism, a switch-tongue, a lever connected at one end to said tongue, means connected with the opposite 80 end of the lever to move it, and a projection engaging the lever intermediately and adapted to form a fulcrum in the movement of the lever.

7. In a switching mechanism, a switch-tongue, a spring-retracted lever connected at its upper end to said tongue, means connected 85 with the lower end of the lever to automatically move it, a projection serving as a fulcrum for the lever in its automatic movement, and 90 an extension of said lever for effecting its movement by hand and independent of the automatic means.

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

WALTER J. BFIELD.

Witnesses:

C. E. ALLYN,

AMELIA DASCOMB.