

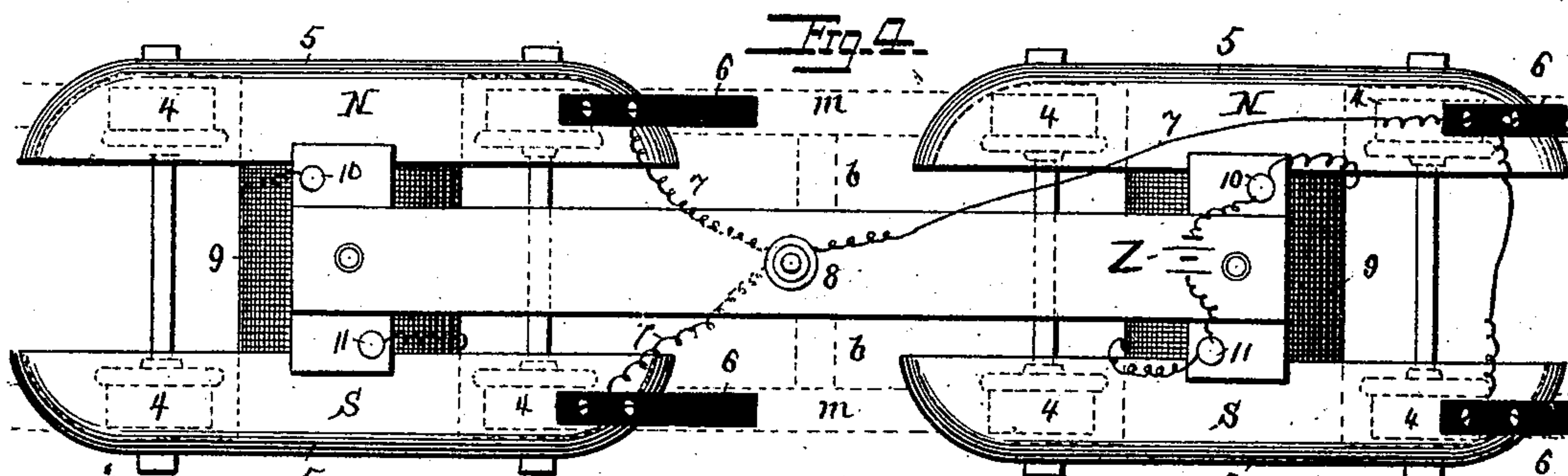
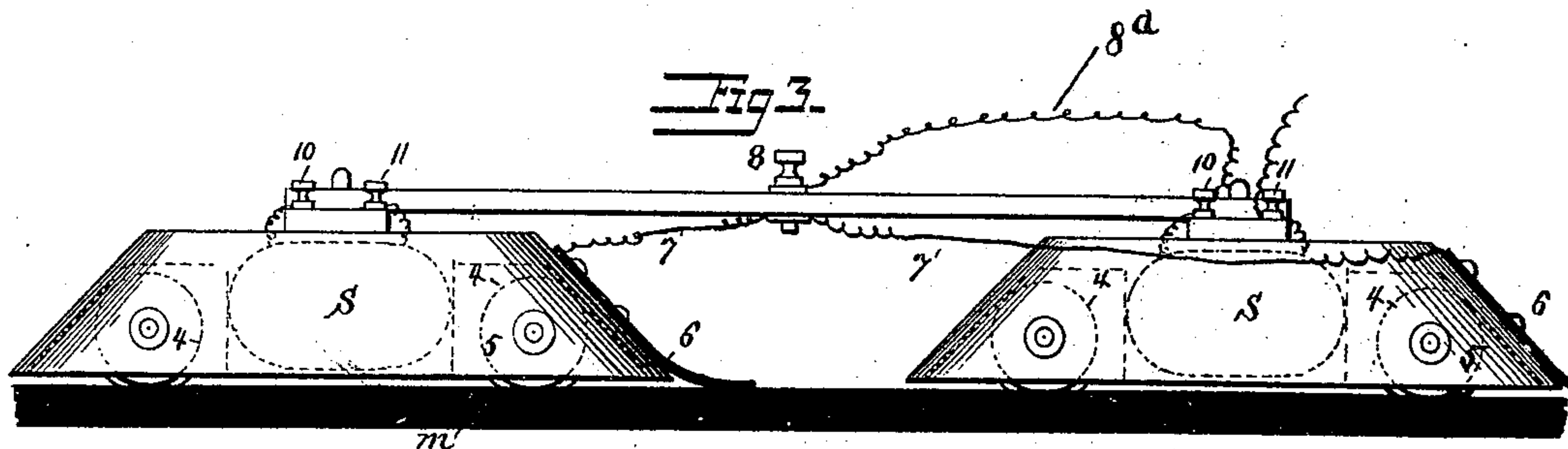
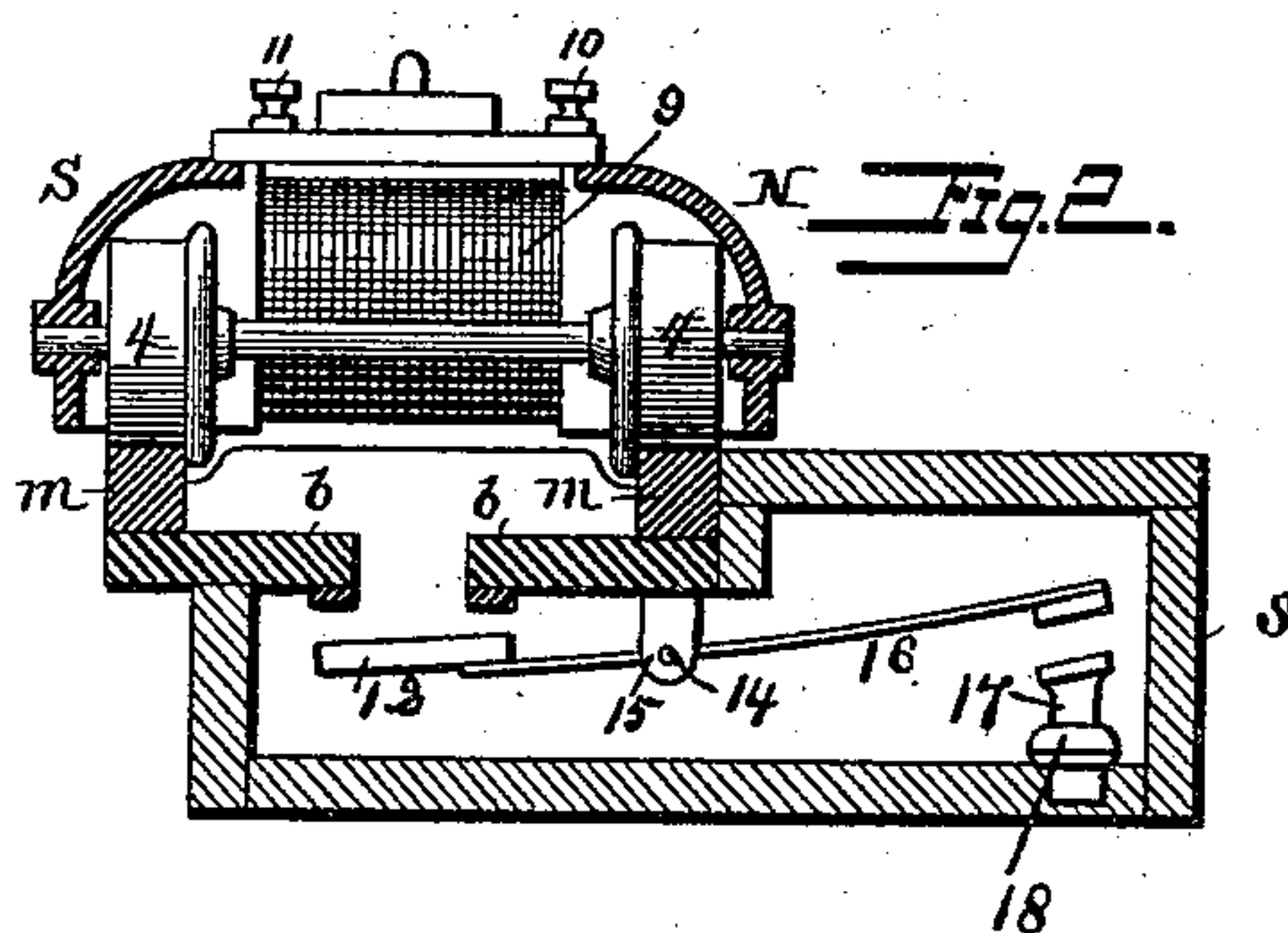
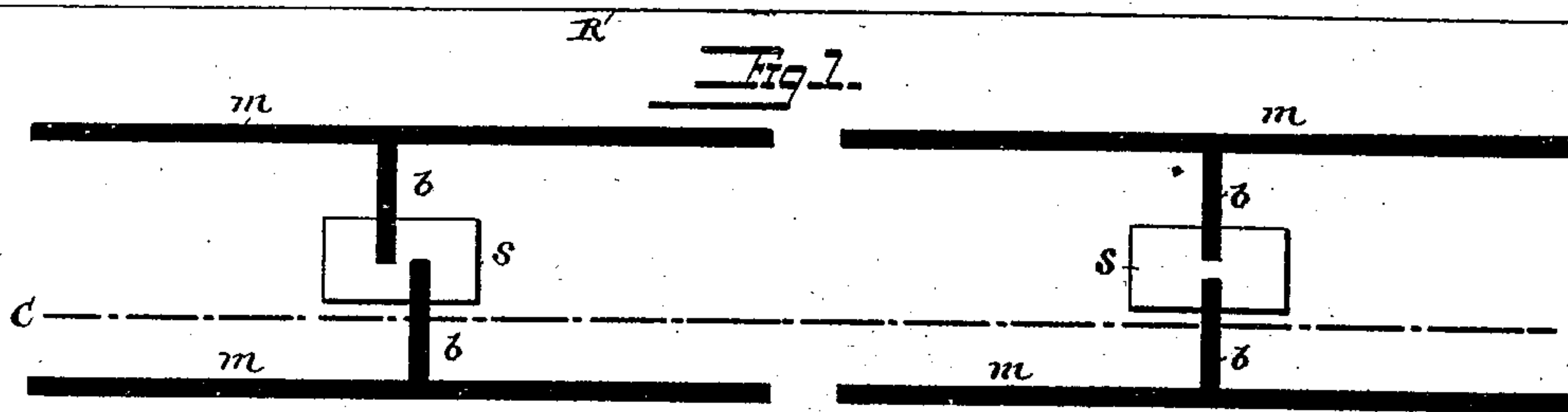
(No Model.)

2 Sheets—Sheet 1.

M. H. SMITH.
ELECTRIC RAILWAY.

No. 552,451.

Patented Dec. 31, 1895.



Witnesses
A. E. Farnham.
Sidney L. Johnson

Inventor
M. H. Smith,
By Foster & Freeman
Attorneys

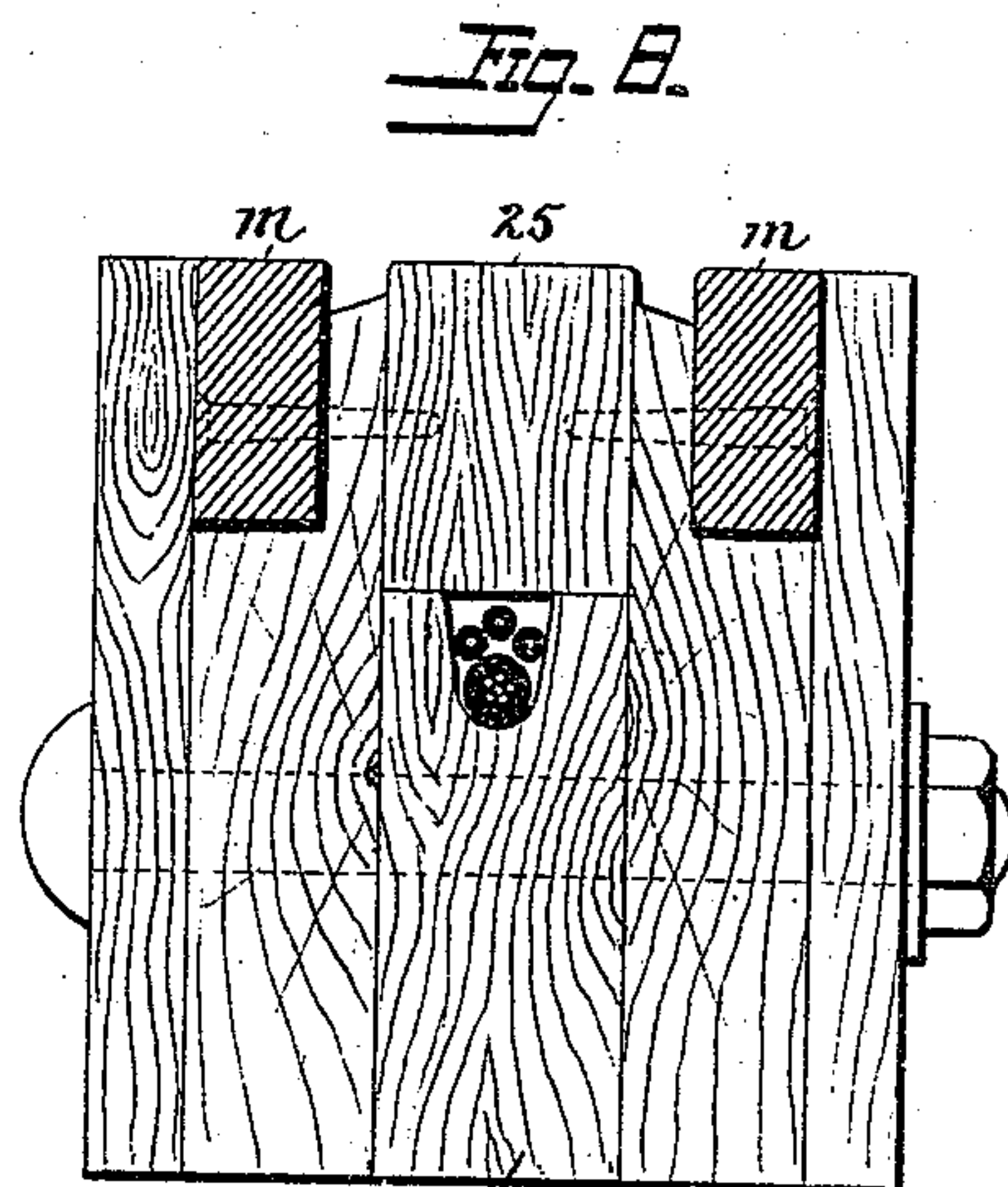
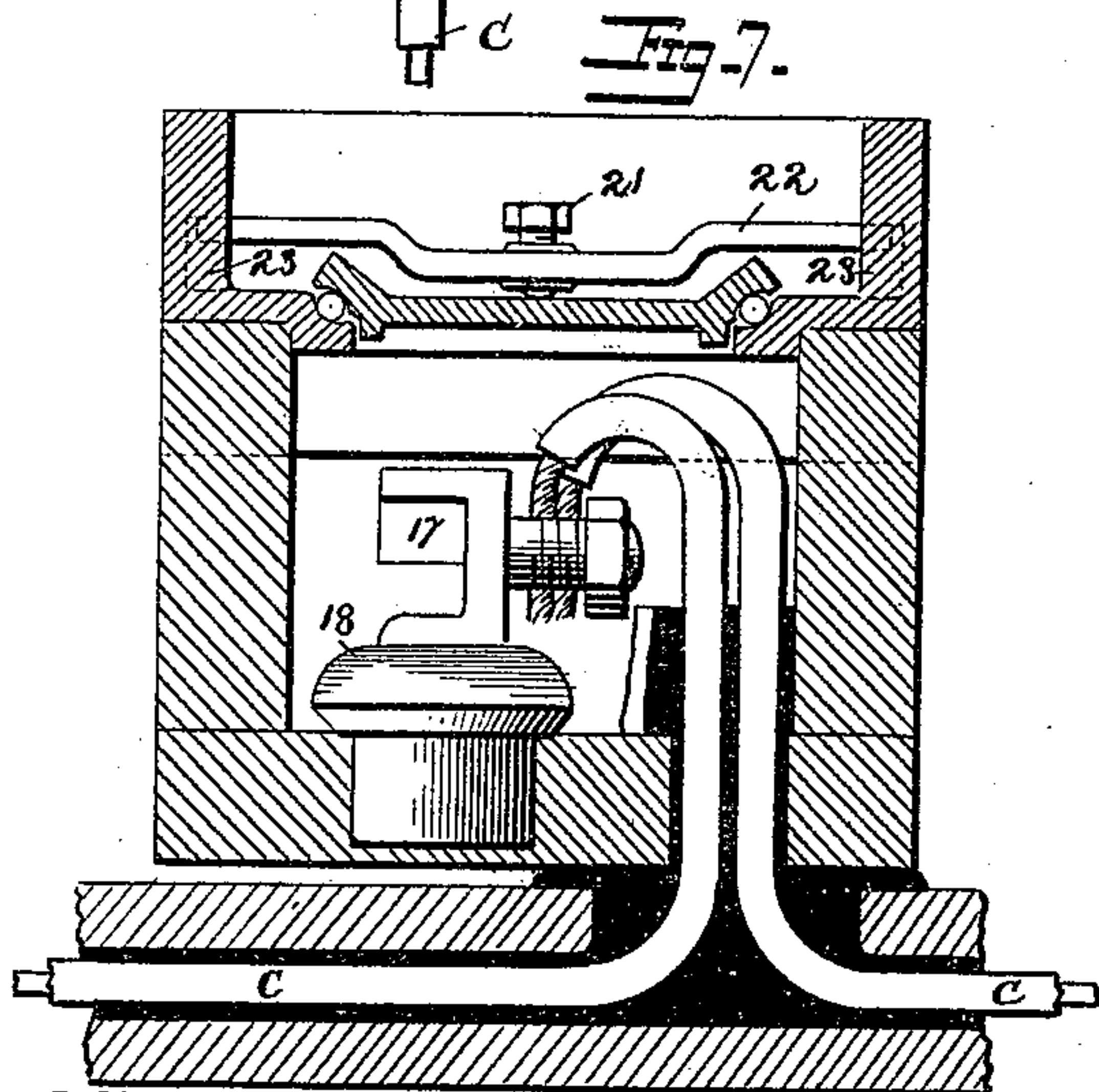
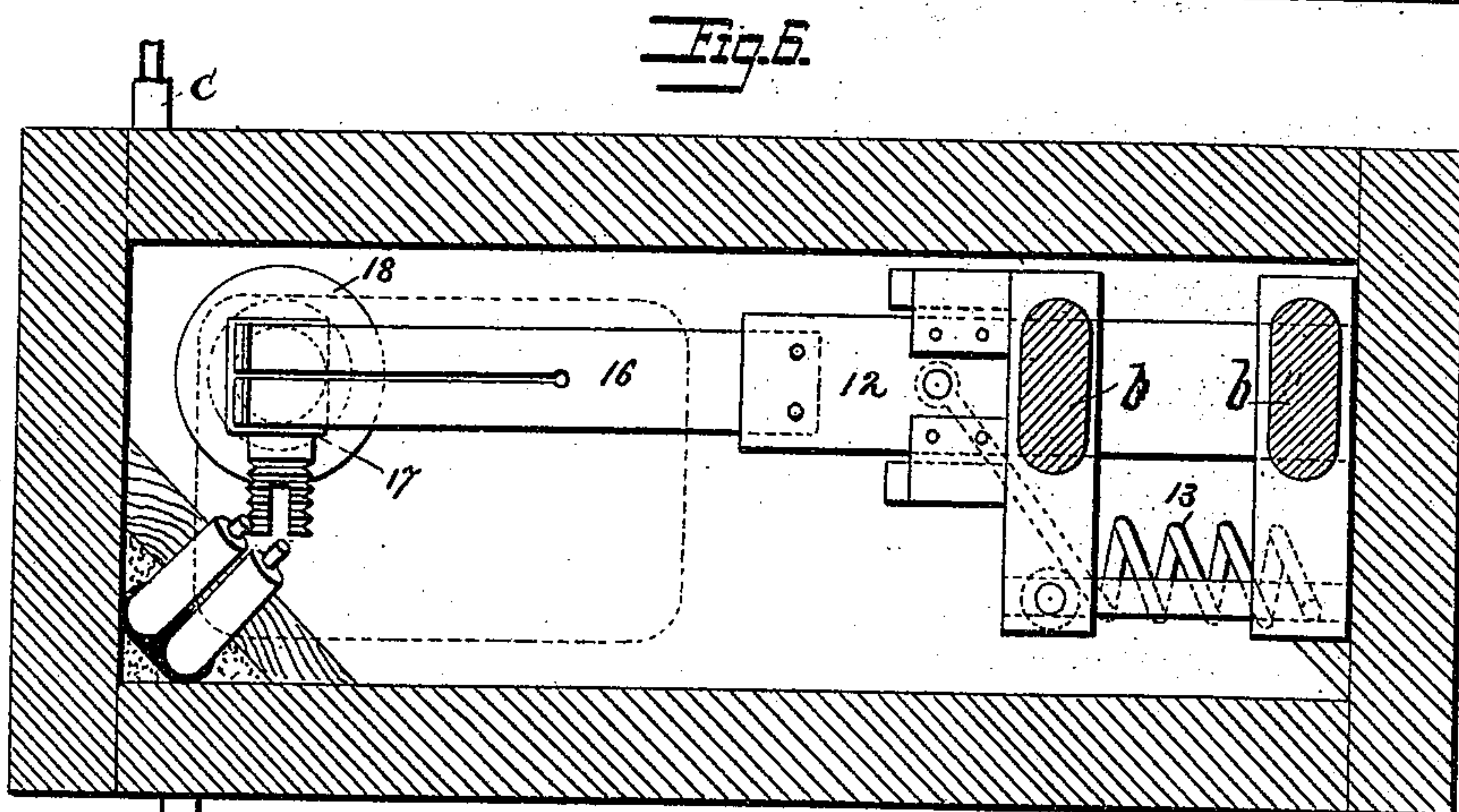
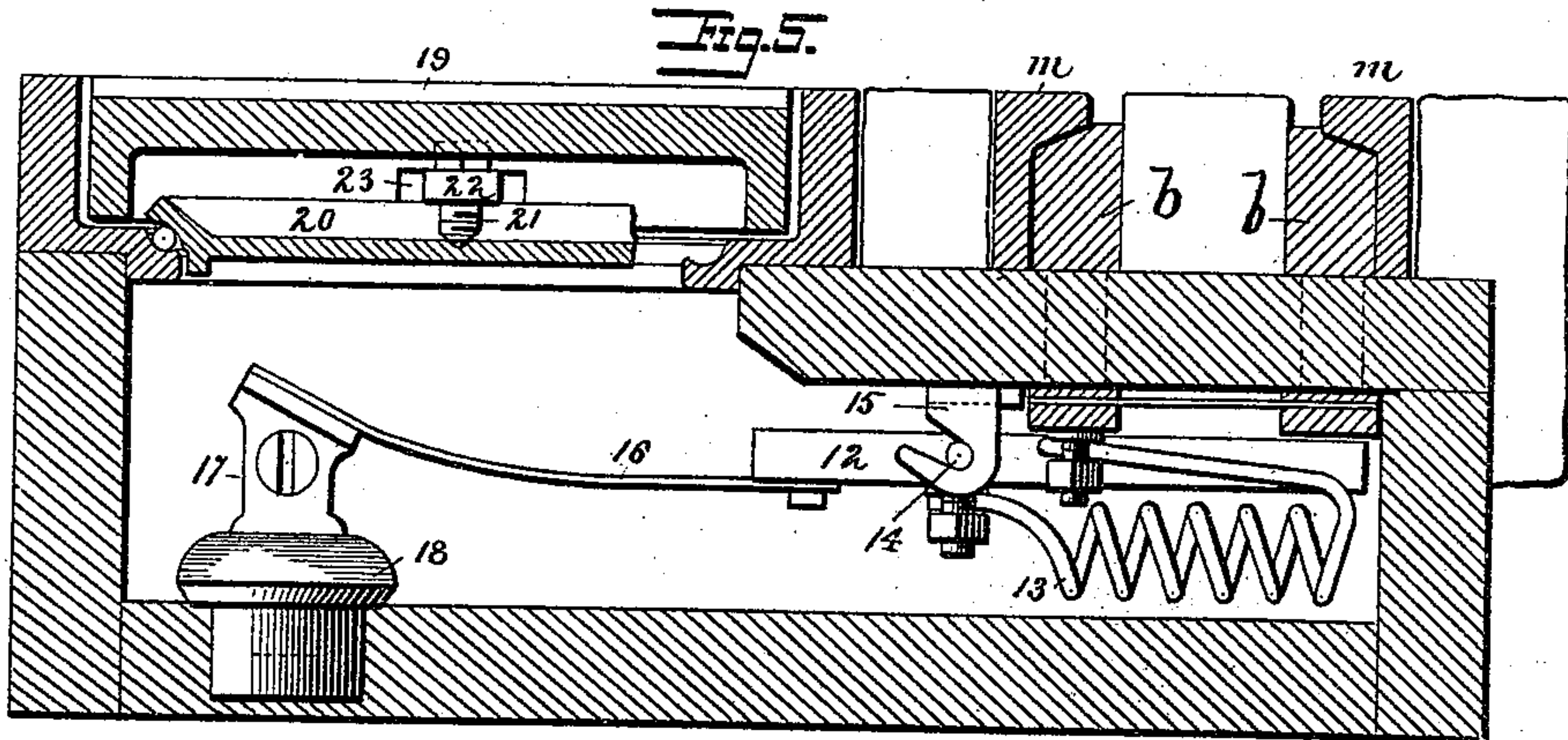
(No Model.)

2 Sheets—Sheet 2.

M. H. SMITH.
ELECTRIC RAILWAY.

No. 552,451.

Patented Dec. 31, 1895.



Witnesses
A. E. Hausmann
Sidney L. Johnson

Inventor
M. H. Smith,
By Foster Freeman
Attorneys

UNITED STATES PATENT OFFICE.

MICHAEL HOLROYD SMITH, OF HALIFAX, ENGLAND.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 552,451, dated December 31, 1895.

Application filed October 26, 1887. Serial No. 253,459. (No model.) Patented in England December 28, 1886, No. 17,018, and in Belgium June 13, 1887, No. 77,792.

To all whom it may concern:

Be it known that I, MICHAEL HOLROYD SMITH, a subject of the Queen of Great Britain, and a resident of Halifax, in the county of York, England, have invented certain new and useful Improvements in Electric Railways, (for which British Letters Patent No. 17,018, dated December 28, 1886, and Belgian Patent No. 77,792, dated June 13, 1887, have been granted to me,) of which the following is a specification.

This invention relates to electric railways, and more especially to that class in which the electricity for actuating the cars is supplied from a generating-station, and conveyed to the track by insulating-cables to which are connected short sections of intermediate conductors arranged between or near the rails, the connections being made electrically; and the object of the invention is to provide an improved means for controlling and making contact between the insulated main cable and short sections.

The subject-matter of this invention has been patented to me in Belgium under Patent No. 77,792, dated June 13, 1887.

In carrying out the invention I employ a magnetic collector or gatherer traveling with the car, and acting by induction to operate a switch to complete the electrical connection between the main insulated cable and the intermediate short sections substantially in the manner more particularly herein pointed out.

The foregoing being the general principle of my invention I will now proceed to show how I carry the same into effect, referring to the accompanying drawings, in which—

Figure 1 is a diagram illustrating the arrangements of circuits. Fig. 2 is a cross-section showing the magnetic collector upon the rails. Figs. 3 and 4 are side and plan views of one form of magnetic gatherer. Figs. 5, 6, and 7 are sectional views showing one form of switch; and Fig. 8 is a section of road-bed, showing one way of supporting the circuits and rails.

In order to fully utilize the magnetizing effect of the collector it is necessary to have the sectional bars in duplicate, one bar operated by the N poles of the collector and the other by the S poles, and, inasmuch as these bars

must be parallel with each other, it is necessary that they be far apart or the lines of magnetic force, for which there is no insulation but space, will seriously leak across from bar to bar and have little effect upon the keeper. I therefore prefer the arrangement of the track for street work to be as shown in Fig. 1, where R R represent the tramrails; C, the buried insulated cable; *m m*, the sectional surface-bars; *b b*, polar extensions which may be placed under ground, (see Fig. 2,) passing into or above the switch-boxes S S concentrating the lines of magnetic force near the armature or keeper 12, within the said boxes.

Figs. 2, 3 and 4 illustrate a form of magnetic collector for working this system, wherein N S are the magnetic poles. To prevent them from clinging so fast to the bars as to hinder their movement they are kept from actual contact by the wheels 4. The axles of these wheels are of brass or other non-magnetic metal. The wheels are protected by an iron case 5, which acts as a clearer of the line and means of attachment of the gatherer-springs 6, which rub upon the bars, gathering the electricity, which by the wire 7 is taken to the terminal 8, from whence it can, by any known means, be conveyed to the motor of the car.

The core 9 of the collector is wound with copper wire and may be excited by the passage of the main current through it on its way from the gatherer-spring 6 to the motor by the conductor 8^a, Fig. 3; but in order to prevent any accidental loss of magnetism by the non-passage of the main current I further provide a battery (indicated at Z, Fig. 4) upon the car which may be used constantly or occasionally to magnetize the said cores, and for this purpose I provide the battery terminals 10 11, 10 11.

In order to effectually magnetize an advance section of the surface-bars, I employ these collectors in duplicate, placing them some distance apart.

A switch-box S is shown in position in Fig. 2, and (though not confining myself to this particular form) I show an enlarged and more detailed view of the same in Figs. 5, 6 and 7.

m m are the surface or polar bars with ex-

tensions *b b* passing through the wooden box placed beneath. These extensions are electrically connected together and to the keeper 12 by the copper wire 13, one end of which is secured to the keeper and the other to the extensions.

The iron keeper 12 is free to rock upon the pin 14 in the hooked bearing 15, and by its own weight falls away from the polar extensions, lifting the attached spring 16 away from the electric terminal 17, which is held in the insulator 18, connected with the underground conductor C, in the manner fully illustrated in Fig. 7. Access is made to the box by the lid 19, strong enough to resist the ordinary street traffic.

20 is an inner lid pressed down upon india-rubber or other packing by the screw 21, passing through the bar 22 held in the recesses 23.

As the surface sectional bars are used for the conveyance of the current from the cable to the car it is necessary that they be fairly insulated from each other and from the earth. This may be done in any approved method, and I illustrate one in Fig. 8, which shows them embedded in creosoted wood coated with pitch or other non-conducting material.

What I claim is—

1. In an electric railway system the combination with the main conductor, of the sectional surface bar conductors having extended pole pieces, and a magnetic switch comprising a pivoted lever carrying an armature for the pole pieces and carrying a contact piece for the main conductor, substantially as described.

2. In a magnetic switch the combination with the pole pieces, of a pivoted armature, a hook support for said armature, an electrical connection between the pole pieces and the armature, and an extension contact piece attached to said armature, substantially as described.

3. A magnetic switch box having a removable cover on one side, pole pieces projecting into said box on the other side, a pivoted armature electrically connected to said pole pieces and carrying an extension to make contact with the electric terminal in the box, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

M. HOLROYD SMITH.

Witnesses:

F. L. FREEMAN,
J. S. BARKER.