

F. E. KINSMAN.
CONTACT MAKER.
APPLICATION FILED FEB. 9, 1907.

911,596.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 1.

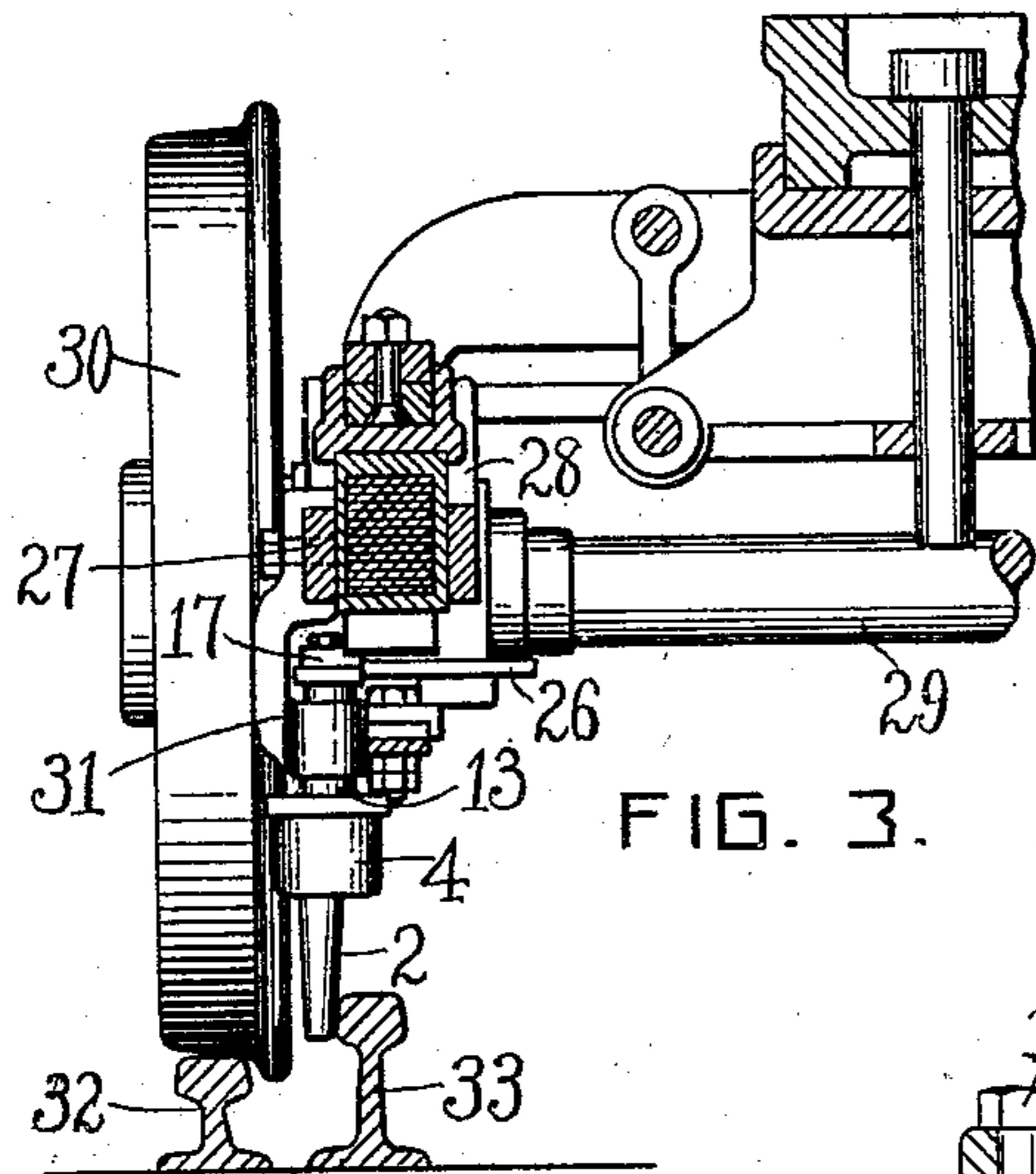


FIG. 3.

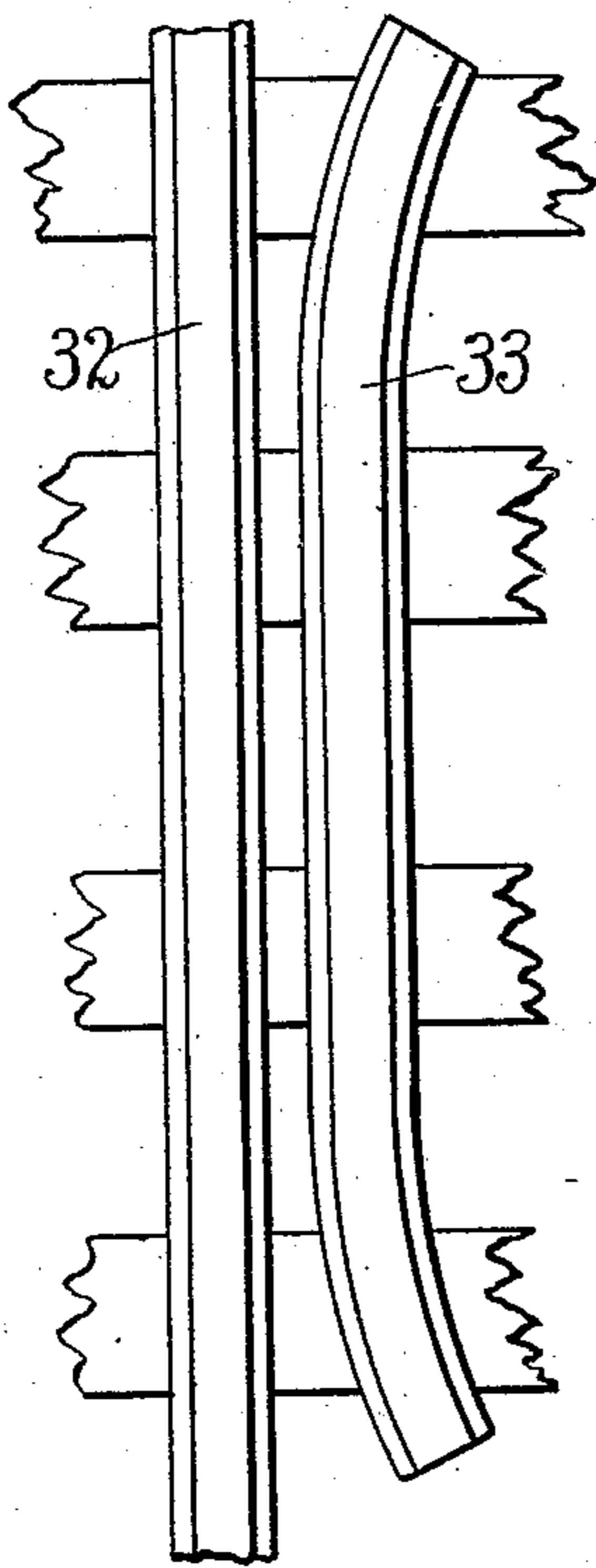


FIG. 4.

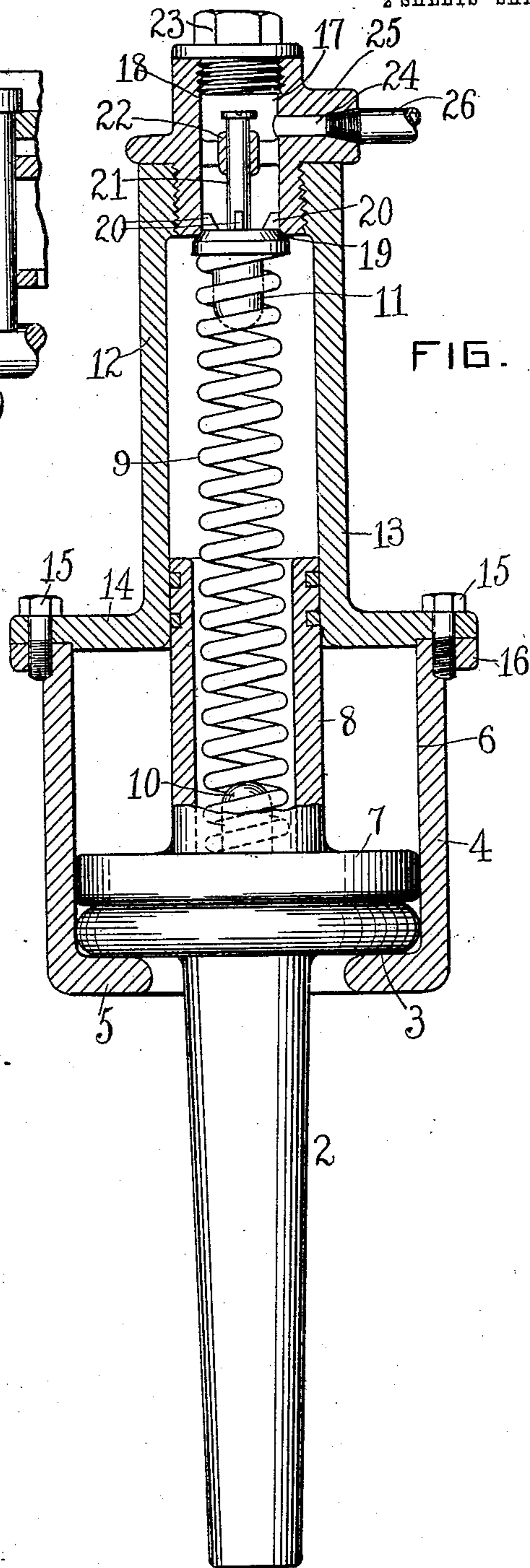


FIG. 1.

Witnesses
R. Blaupien
J. H. Jones

Inventor
Frank E. Kinsman
By his Attorney

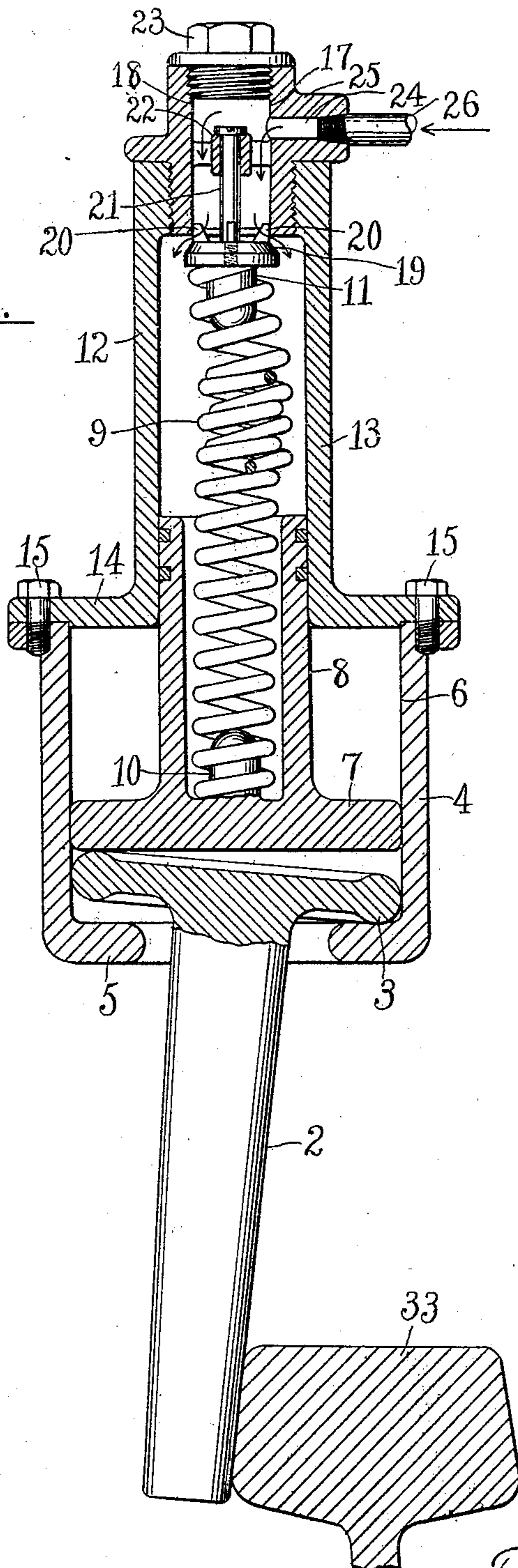
F. E. KINSMAN.
CONTACT MAKER.
APPLICATION FILED FEB. 9, 1907.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 2.

911,596.

FIG. 2.



Witnesses
R. Champion
J. H. Jones

Inventor
Frank E. Kinsman
By his Attorney
R. Champion

UNITED STATES PATENT OFFICE.

FRANK E. KINSMAN, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO THE KINSMAN BLOCK SYSTEM COMPANY, A CORPORATION OF NEW YORK.

CONTACT-MAKER.

No. 911,596.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed February 9, 1907. Serial No. 356,512.

To all whom it may concern:

Be it known that I, FRANK E. KINSMAN, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Contact-Makers, of which the following is a specification.

This invention relates to improvements in contact-makers, and particularly to improvements in electrical contact-makers for railway work, as for example, in closing an electric circuit for the purpose of automatically shutting off the power or applying the brakes or doing both of these things, or otherwise operating upon mechanism carried by a vehicle or train for the purpose of stopping or reducing the speed of such train, as set forth in prior patents granted to me.

The principal object of my present invention is to provide a contact-maker of such construction that it will operate properly under all conditions met with in railway work, and especially to provide a contact-maker which is capable of yielding in any direction when an undue resistance is opposed to it, and to accomplish this result without complicating the construction of such contact-maker.

In the preferred form of the device the contact-arm proper will preferably be a single piece of metal so constructed as to cooperate properly with a contact-rail or other contact device on a line of way and so combined with its supporting means as to yield freely in various directions as may be required. The preferred construction is that in which a single contact-arm is movable as a whole with respect to its support in different intersecting paths, the principal movements being the usual angular movements back and forward or sidewise, which are usually only obtained from a complicated jointed contact-arm, while in addition to these main movements which contact-devices frequently have, another movement is provided for, to wit, a movement lengthwise of the contact-arm, that is, a movement up and down with respect to the roadbed over which the contact-arm travels. The forward and upward and sidewise movements of the contact-arm are preferably obtained in the construction used by me by providing a universal connection between the contact-arm and its support, while the up-and-down movement of the contact-arm may be obtained by mount-

ing the contact-arm so as to slide on its support. This combination of movements is such as to permit the contact-arm to yield regardless of the direction from which resistance is opposed to the travel of the arm, and it is also such as to permit the contact-maker to engage either side or the top, or any other part, of a rail or other fixed contact element on the roadbed, thereby adapting a single contact-maker for use under all conditions met with on the line. As to these features of my invention the construction illustrated in the present case is alternative with that disclosed in the application filed by me January 29th, 1906, Serial No. 298321.

Another important feature of the invention is the provision of separate means, one of which is normally in action and the other of which is brought into action when the first means fails, for yieldingly holding the contact-maker in a normal or central position when it is not in contact with a fixed rail or other track contact, said means serving to assure a good contact between the contact-arm and the contact-rail or other fixed part. These two means for yieldingly holding the contact-arm in a normal position are preferably so combined that one constitutes the main means and the other an auxiliary means for holding the contact-maker in its normal position, the auxiliary means being dependent upon the failure of the main means to act properly and being brought into action when the main means fails to operate.

In the drawings accompanying this specification and forming part of the present application Figure 1 is a longitudinal section and elevation of a contact-maker embodying my present invention, and showing the parts in their normal positions. Fig. 2 is a similar view showing the working position of the contact-arm and also showing the auxiliary means in action as the result of failure of the main means to keep the contact-arm in its working position. Fig. 3 is a detail illustrating my improved contact-maker mounted on a vehicle and in operative relation with track and contact-rails on a railway. Fig. 4 is a detail illustrating in plan contact and track rails cooperative with the contact-maker.

Similar characters designate like parts in all the figures of the drawings.

My improved contact-maker, though of general use in railway work, is especially adapted for closing a break in a circuit for

automatically controlling the movement of a vehicle or train on the railway. For such a purpose as this, the contact-maker must be strong and durable, not likely to get out of order, and capable of making a positive and strong rubbing contact so as to assure the passage of sufficient current to operate the brakes or shut off the power, as the case may be.

In the preferred construction I make use of a contact-arm, such as 2, consisting of a single piece of metal of suitable strength having a universal connection with its support and also a sliding connection with its support in a substantially vertical direction. In this case the contact-arm has at its upper end a head 3, which may be of any desired shape but is preferably circular, and this constitutes one member of a joint by means of which a yielding connection is effected between the arm and its support. The other member of the connection is preferably in the support, and this support, as here shown, may be a casing, such as 4, having an internal stop which may be in the form of a heavy flange 5. This stop or flange limits the downward movement of the contact-arm. The casing 4 may also be of any suitable construction and embodies means for guiding the contact-arm in the direction of the length of the same. This means for guiding said arm as illustrated in the drawings is the cylindrical wall 6 of the guide-chamber or cylinder formed by the casing 4. The head 3 of the contact-arm fits this guide-chamber or cylinder and is movable back and forth therein, that is, up and down, to permit the contact-arm to yield to obstructions, particularly when making a top contact.

The contact-arm 2 is shown in Fig. 1 in its normal position centered and pressed downward to the limit of its downward movement. It will be held in this normal position by any suitable means, preferably by means of a spring which normally holds it in its central position and tends to return it to that position when shifted to any other. The pressure applied by this spring should be evenly distributed over the head of the contact-arm, and in order to accomplish this result I have shown at 7 a piston having a hollow hub or extension 8 in which one end of a strong helical spring 9 is inserted. The two ends of this spring are located in place by means of bosses, such as 10 and 11, the latter of which is integral with a valve which will be hereinafter described. The piston 7 is of the same diameter as the head 3 and is guided by and works in the same guide-chamber 6. The hub 8 works in a chamber or cylinder space 12 of smaller diameter, this cylinder space being formed in a casing member 13 having a flange 14 which is bolted at 15 to a complementary flange 16 on the lower casing member 4. The parts just described are assembled

before the two members of the casing are bolted together.

In the normal action of the parts so far described, the contact-arm 2, when a suitable resistance is opposed to it, is capable of tipping in any angular direction, that is to say, it has a universal movement, with respect to its support. Moreover, it may also have either separately or in conjunction with such angular movement a movement up and down to enable it to accommodate itself to differences in height of the fixed contact-face on a roadbed which it engages when it makes a top contact. In order that the contact-arm may still be maintained in its working position should the spring 8 break or fail to operate properly, I prefer to provide an auxiliary means for holding the contact-arm in its working position while permitting it to yield to the necessary extent in the various directions specified. The auxiliary means provided may be of any suitable type, but preferably will be a source of fluid pressure derived, for example, from the fluid-pressure brake system of the car or train on which the contact-arm is carried. This auxiliary means should be of inferior power to that of the spring which normally holds the contact-arm in its proper position, as otherwise the fluid pressure of this auxiliary means would be used unnecessarily and therefore wasted. The power of this spring is sufficient to maintain the contact-arm in its proper position and also to hold closed a valve which governs the operation of such auxiliary means and which shuts off the fluid pressure or air pressure from the brake system except when the spring is no longer effective and fails to operate properly. These main and auxiliary means for holding the contact-arm in the normal position and for bringing the auxiliary means into action when the main means fails to operate are shown in Figs. 1 and 2, in which I have illustrated the auxiliary means as automatically held out of action normally and automatically brought into action when the spring breaks or for any other reason fails to work properly. At the upper end of the casing member 13 a cylindrical member 17 is screwed into the part 13. This cylindrical member 17 has a preferably cylindrical bore 18 of much smaller area than the chamber 12, and in this bore a valve 19 is guided by means of guide-pieces 20. Said valve has a stem 21 which may be a headed screw-bolt with a long shank, and this valve-stem works in a bearing in a hub 22 cast integral with the cylindrical member 17. The valve 19 is normally pressed to its seat by the spring 9, and the cylindrical member 17 is closed at its upper end by a screw-threaded plug or cap 23. The member 17 has an inlet opening for the admission of fluid pressure, this opening being shown at 24 at one side of

said member. In this construction said opening is formed in a boss 25, and its outer end is threaded for the reception of a pipe 26 which is in communication with any suitable source of fluid pressure, this source usually being the train-pipe of an air-brake system. The force exerted by the air admitted through the pipe 26 into the cylinder space above the valve 19 is inferior to that exerted by the spring 9 even when the parts are in the position shown in Fig. 1, and normally said spring will therefore hold the valve 19 against its seat and prevent the entrance of the compressed air into the chamber 13 and into the bore in the wall 8.

Should the spring 9 be broken, as shown in Fig. 2, or lose its resilience in any other way, the pressure of the air in the train-pipe will be sufficient to force down the valve away from its seat, as shown in Fig. 2, whereupon the compressed air admitted into the chamber 13 will operate upon the end of the hub 8 and on the walls at the end of the bore in said hub, and will tend to normally force the parts 3 and 7 to the positions shown in Fig. 1 and yieldingly hold them in such normal positions, the pressure of the elastic fluid, however, permitting the contact-arm 2 to yield and change its position just as it does when the spring 9 is effective for controlling the position thereof. The area of these surfaces of the parts 7 and 8 against which the air pressure acts is much greater than the area of the surface of the valve 19 against which such pressure is first directed, and is sufficient to assure the maintenance of the contact-arm in operative relation with the track contacts. It will be noticed that the pressure admitted into the cylinder spaces of this contact-maker is not wasted, all of the parts into which the air is admitted coöperating in such a manner as to constitute a closed chamber from which the air pressure can not escape in such a manner as to be wasted.

My improved contact-maker is preferably supported on a car or other vehicle so as to move in unison with the axles and wheels thereof. In this construction it is shown as carried directly by an equalizing bar 27 in fixed relation with the axle-boxes 28 in which the axles 29 carrying the wheels 30 turn. The details of construction of the means for securing the contact-maker to the equalizing-bar are not important so long as the parts have sufficient strength and are of simple design. In this case, however, I have shown the contact-maker carried by a depending bracket 31 bolted securely to the equalizing-bar 27. The relative positions of the contact-arm and of the rim of the wheel 30 should be such as to render it impossible for the contact-arm when in its normal position to strike the track rails of the line of way or make any

contact with any other parts than the contact-rails or fixed contacts through which the electric circuits are to be made for operating the automatic stopping means or other devices controlled by such contact-arms.

Referring to Fig. 3, it will be seen that the track-rail 32 on which the wheel 30 runs is much lower than the contact-rail 33 with which the arm 2 makes rubbing contact. It will also be noticed that the lower end of said arm is slightly above the rail 32 and can not strike the track-rail in taking switches, etc. In Fig. 3 said contact-arm is shown as making side contact with the track-rail or guard-rail 33 and as inclined sidewise at a slight angle to its normal position, in order to obtain a good rubbing contact.

What I claim is:

1. An electrical contact-maker, comprising a support, and a contact-arm consisting of a rigid member carried by said support and in bearing engagement therewith and movable as a whole in a plurality of intersecting paths passing through said support and also about its own longitudinal axis.

2. An electrical contact-maker, comprising a support, and a contact-arm consisting of a rigid member carried by said support and in bearing engagement therewith and movable as a whole in the direction of its length and also transversely relatively to its support and also about its own longitudinal axis.

3. An electrical contact-maker, comprising a support, and a contact-arm consisting of a rigid member carried by said support and in bearing engagement therewith and movable as a whole in the direction of its length and also in different directions transversely relatively to its support and also about its own longitudinal axis.

4. An electrical contact-maker, comprising a support, and a contact-arm consisting of a rigid member carried by said support and in bearing engagement therewith and movable universally relatively thereto and also about its own longitudinal axis.

5. An electrical contact-maker, comprising a support, and a contact-arm consisting of a rigid member substantially circular in cross section carried by said support and in bearing engagement therewith and movable lengthwise and also universally relatively to its support and also about its own longitudinal axis.

6. An electrical contact-maker, comprising a support, a contact-arm consisting of a rigid member carried by said support and movable as a whole in a plurality of intersecting paths passing through said support and also about its own longitudinal axis, and means for yieldingly holding said contact-arm in a normal position.

7. An electrical contact-maker, comprising a support, a contact-arm consisting of a rigid member carried by said support and movable universally relatively thereto and
5 also about its own longitudinal axis, and means for yieldingly holding said contact-arm in a normal position.

8. An electrical contact-maker, comprising a support, a contact-arm consisting of a
10 rigid member carried by said support and movable lengthwise and also universally relatively to said support and also about its own longitudinal axis, and means for yieldingly holding said contact-arm in a normal
15 position with respect to both its lengthwise and universal movements.

9. An electrical contact-maker, comprising a support, a contact-arm consisting of a rigid member carried by said support and
20 movable lengthwise relatively to said support and also about its own longitudinal axis, and means for yieldingly holding said contact-arm in a normal position.

10. An electrical contact-maker, comprising a support having a guide, a contact-arm consisting of a rigid member movable length-
25 wise along said guide, and means for yieldingly holding said contact-arm in a normal position.

11. An electrical contact-maker, comprising a support having a guide-chamber, a contact-arm consisting of a rigid member movable lengthwise in contact with the
30 walls of said guide-chamber and also movable transversely, and means for yieldingly holding said contact-arm in a normal position.

12. An electrical contact-maker, comprising a support having a guide-chamber, a
40 contact-arm consisting of a rigid member movable lengthwise in contact with the walls of said guide-chamber and also movable universally relatively thereto, and means for yieldingly holding said contact-
45 arm in a normal position.

13. The combination with a support, of a contact-arm carried by said support and movable relatively thereto, and alternative
50 means for yieldingly holding said contact-arm in a normal position one of said means being normally in action and the other being normally out of action but in condition to be brought into action when required.

14. The combination with a support, of a
55 contact-arm carried by said support and movable relatively thereto, and alternative means for yieldingly holding said contact-arm in a normal position one of said means being normally in action and the other being
60 normally in condition to be brought into action but being normally held out of action by the first.

15. The combination with a support, of a contact-arm carried by said support and
65 movable relatively thereto, means for yield-

ingly holding said contact-arm in a normal position, and separate means controlled by said first means for holding said contact-arm in said normal position on the failure of said first means to operate.

16. The combination with a support, of a contact-arm carried by said support and movable relatively thereto, a spring for yieldingly holding said contact-arm in a normal position, and separate means controlled
75 by said spring for yieldingly holding said contact-arm in said normal position on the failure of said spring to operate.

17. The combination with a support, of a contact-arm carried by said support and
80 movable relatively thereto, a spring for yieldingly holding said contact-arm in a normal position, and a source of fluid pressure controlled by said spring for yieldingly holding said contact-arm in said normal position
85 on the failure of said spring to operate.

18. The combination with a support, of a contact-arm carried by said support and movable crosswise relatively thereto, means for yieldingly holding said contact-arm in a
90 normal position, and separate means controlled by said first means for holding said contact-arm in said normal position on the failure of said first means to operate.

19. The combination with a support, of a
95 contact-arm carried by said support and movable universally relatively thereto, means for yieldingly holding said contact-arm in a normal position, and separate means controlled by said first means for holding said con-
100 tact-arm in said normal position on the failure of said first means to operate.

20. The combination with a support, of a contact-arm carried by said support and movable lengthwise and also crosswise rela-
105 tively to said support, means for yieldingly holding said contact-arm in a normal position, and separate means controlled by said first means for holding said contact-arm in said normal position on the failure of said
110 first means to operate.

21. The combination with a support, of a contact-arm carried by said support and movable relatively thereto, means for yield-
115 ingly holding said contact-arm in a normal position, and separate means connected with a fluid-pressure brake system and controlled by said first means for yieldingly holding said contact-arm in said normal position on the failure of said first means to operate.

22. The combination with a support, of a contact-arm carried by said support and movable relatively thereto, and alternative means for yieldingly holding said contact-arm in a normal position, one of said means
125 being of superior power and normally in action, and the other being of inferior power and normally held out of action by the first and operative on the failure of the first to act.

23. The combination with a cylinder, of a 130

piston movable in said cylinder, a movable contact-arm controlled in its movements by said piston, a spring for yieldingly holding said contact-arm in its normal position, and
5 a source of fluid pressure controlled by said spring for yieldingly holding said contact-arm in said normal position on the failure of said spring to operate.

24. The combination with a cylinder, of a
10 piston movable in said cylinder, a movable contact-arm controlled in its movements by said piston, a spring for yieldingly holding said contact-arm in its normal position, a valve normally held closed by such spring,
15 and a source of fluid pressure governed by said valve and operative for opening the

same and yieldingly holding said contact-arm in said normal position on the failure of said spring to operate.

25. The combination with a support, of a 20 contact-arm carried by said support and movable relatively thereto, and a source of fluid power for holding said contact-arm in a normal position.

Signed at city of New York, in the county 25 of New York and State of New York this 8th day of February A. D. 1907.

FRANK E. KINSMAN.

Witnesses:

EDGAR A. FELLOWS,
ROBERT CHAMPION.