

V. F. MORGAN.  
ADAPTABLE TERMINAL CONTACT FOR SAFETY FUSES.  
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930,606.

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Fig. 1

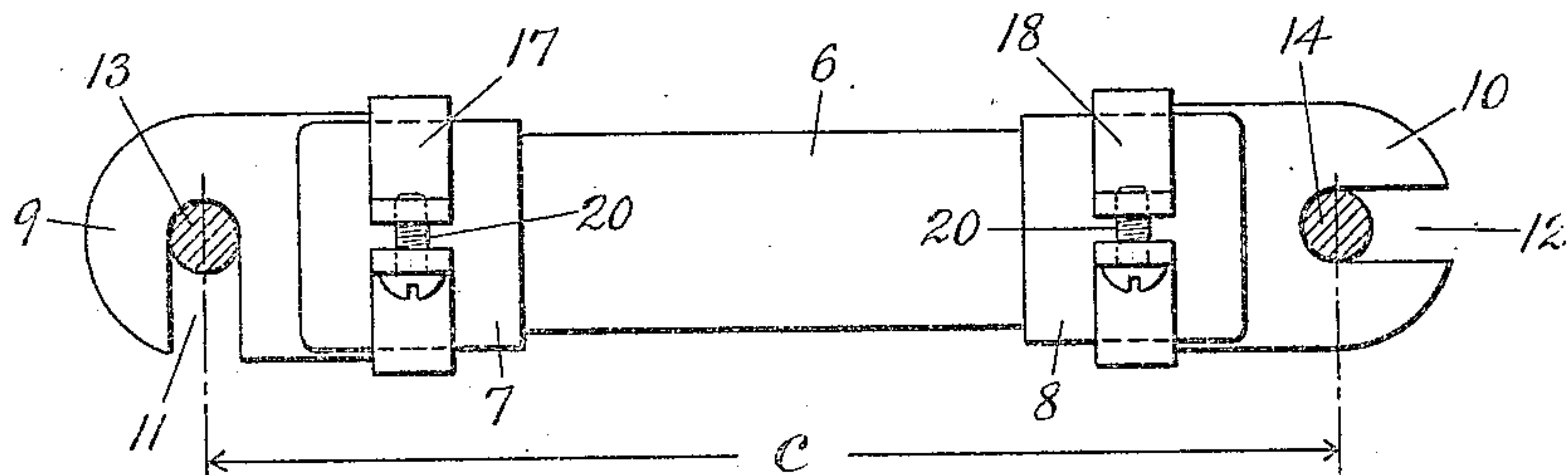


Fig. 2

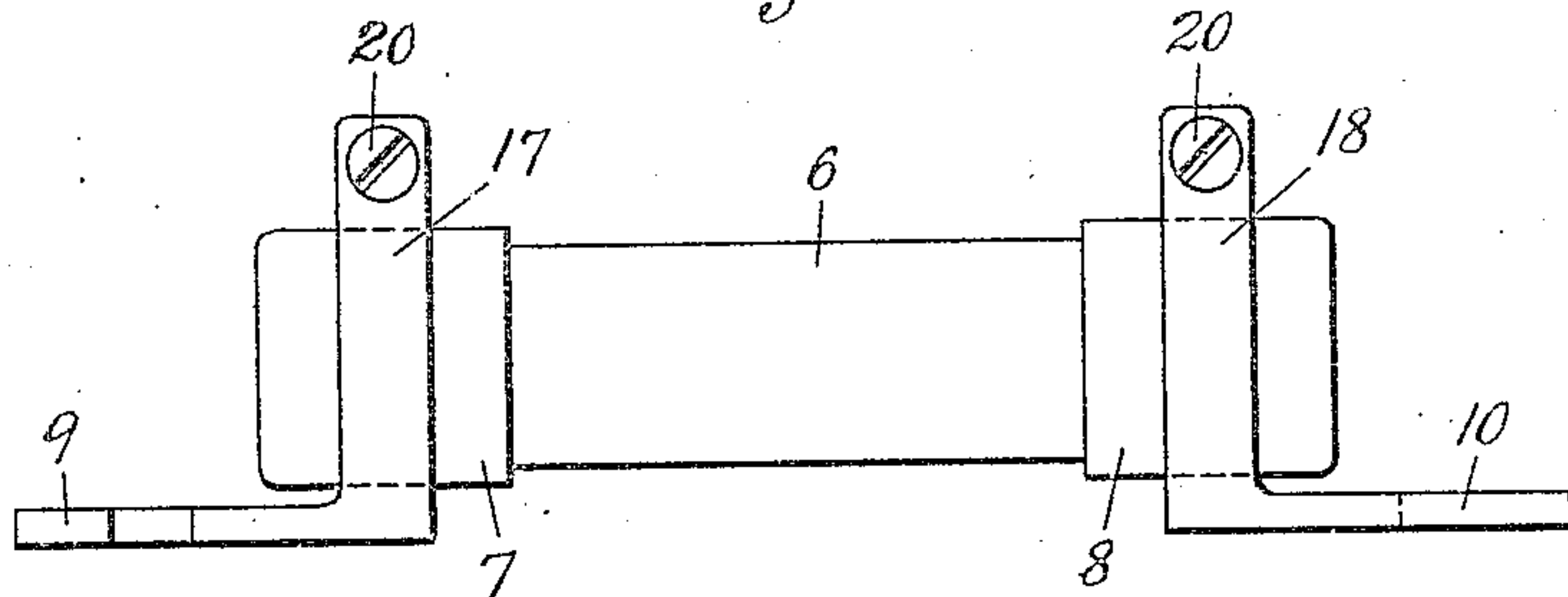


Fig. 3

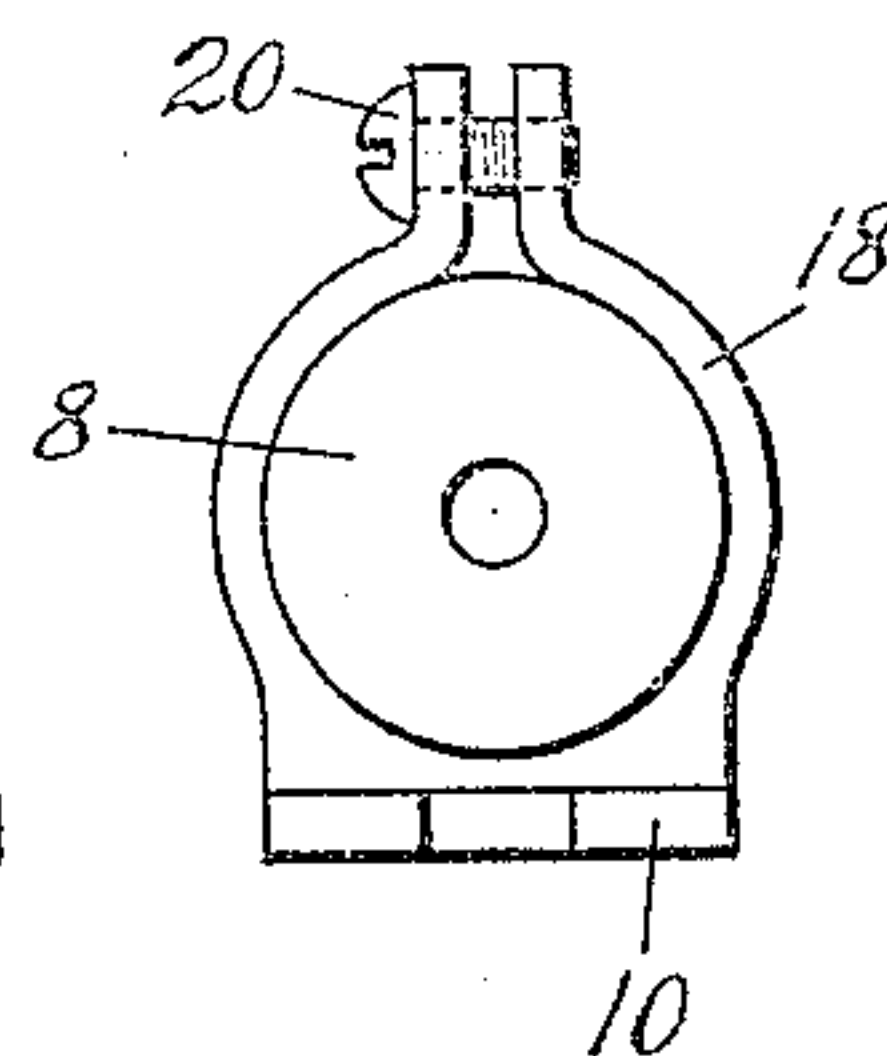


Fig. 4

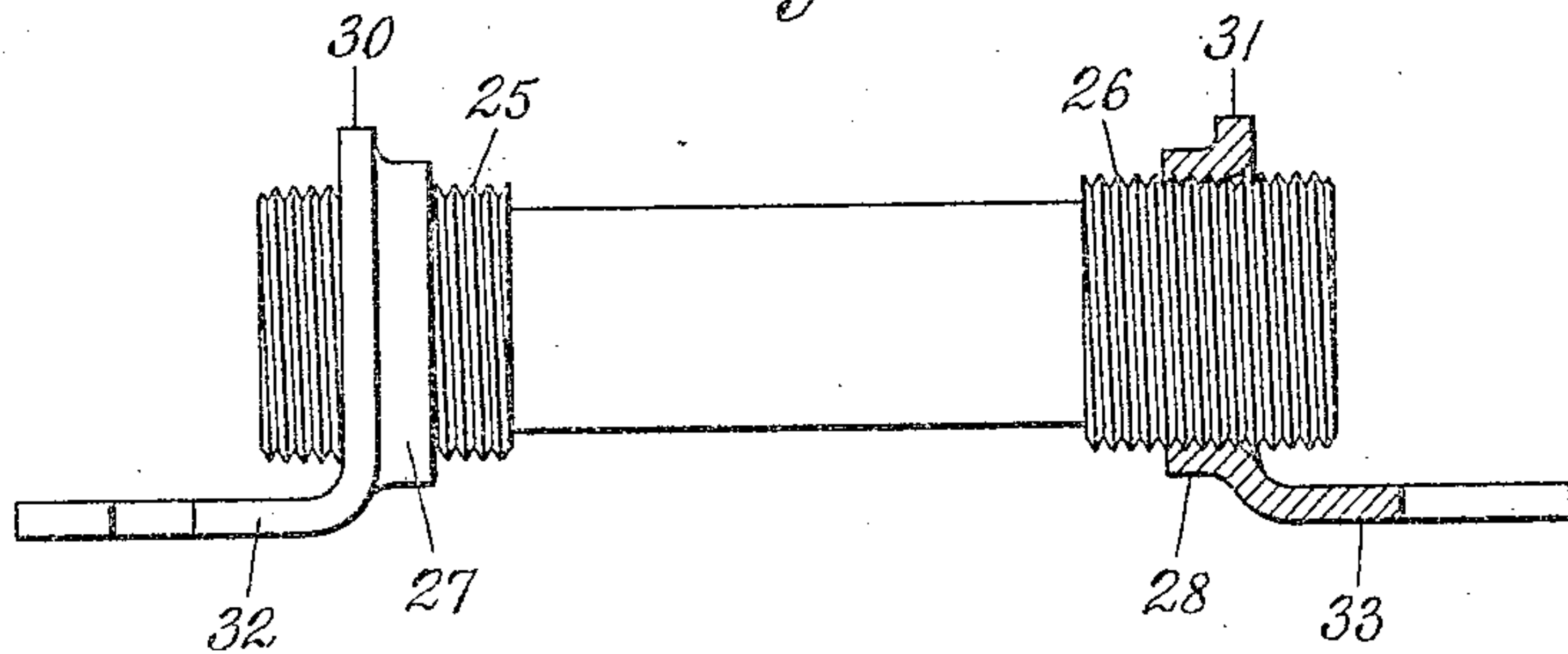
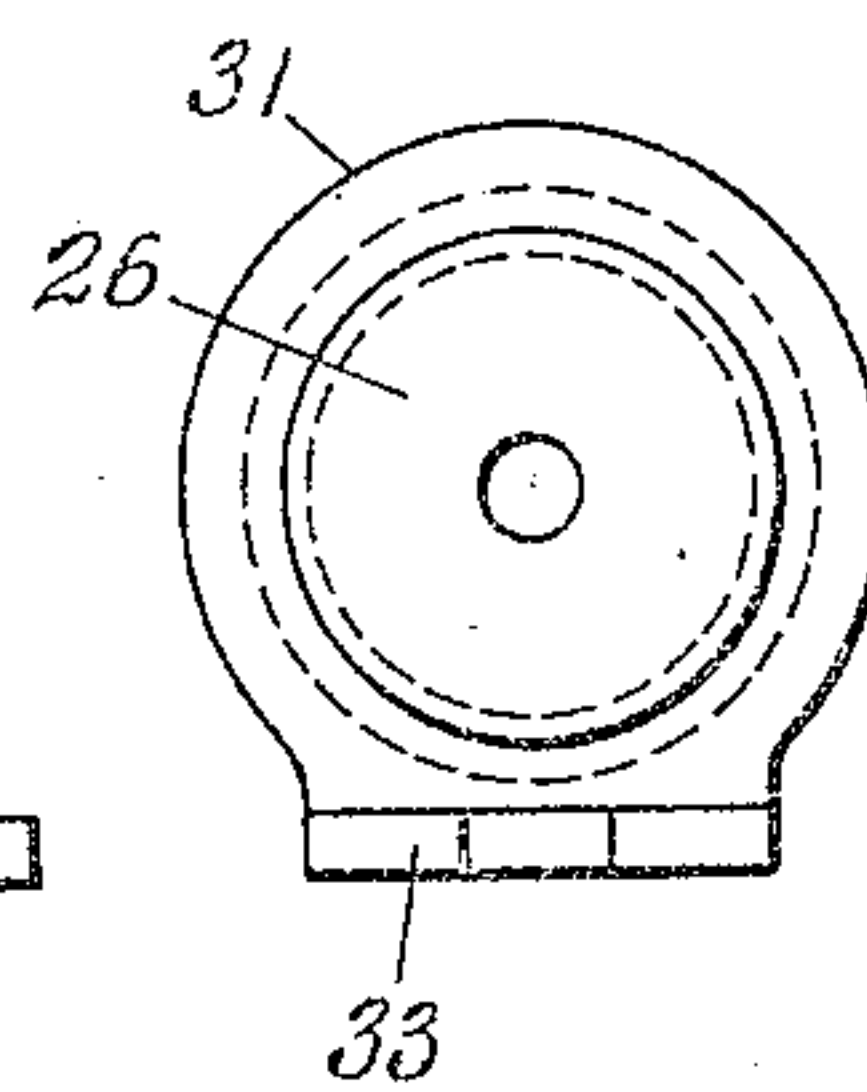


Fig. 5



Witnesses:  
H. Mallner  
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Inventor  
Victor F. Morgan  
By J. H. Honiss, Atty.



# UNITED STATES PATENT OFFICE.

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## ADAPTABLE TERMINAL CONTACT FOR SAFETY-FUSES.

No. 930,608.

Specification of Letters Patent.

Patented Aug. 10, 1908.

Application filed March 7, 1906. Serial No. 304,623.

*To all whom it may concern:*

Be it known that I, VICTOR F. MORGAN, a citizen of the United States, and resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Adaptable Terminal Contacts for Safety-Fuses, of which the following is a full, clear, and exact specification.

This invention relates to terminal contacts for electrical devices, and is particularly adapted for use in connection with standard inclosed safety fuses, the object being to provide simple and effective means for connecting such fuses to circuit terminals placed at differing distances apart. These inclosed safety fuses consist of a fusible conductor, incased in a suitable inclosing tube, provided with fuse terminals commonly called ferrules at their ends. The fuse terminals are connected with, or form electrical extensions of the fusible conductors, and are fixed at the ends of the fuse. They usually have flat slotted contact portions which engage with fixed circuit contacts to which the ends of the circuit wires are electrically connected. According to present methods these fuse terminals are clamped to the fixed circuit contacts by screws passing through the slots, and it is therefore necessary to have the fuses specially constructed to fit varying arrangements and spacings of the fixed circuit terminal contacts. For example, one of these fuses having terminals to fit contacts four inches apart cannot be used in contacts only three inches apart. Hence it has been found necessary in the past to make a large number of fuses, varying in lengthwise dimensions, to adapt them for use on the different fittings in common use, which vary greatly in their center distance *c*. This is particularly the case where panel boards or cut-outs have been constructed for use with the so-called open fuse wires or fuse links. In order to construct an inclosed fuse to fit any of these devices, it has been necessary to first ascertain quite accurately the distance apart of the terminal contacts.

By the present invention I am enabled to considerably lessen the number of different lengths of fuses, and at the same time to adapt the existing standard lengths of ferrule contact fuses for use in cases where the holes for the clamping screws of the circuit contacts have already been established. This is

accomplished in this invention by fitting the fuse with fuse terminal contacts which are adjustable lengthwise on the fuse itself.

Figure 1 is a plan view of a standard ferrule contact inclosed fuse, shown in connection with my improved terminal contacts. Figure 2 is a side view projected from Fig. 1. Figure 3 is an end view projected from Fig. 2. Figure 4 is a side view of a modified form of the invention, one of the terminal contacts being shown in cross section. Figure 5 is an end view projected from Fig. 4.

In the embodiment shown in Fig. 1, the fuse tube 6, having the ferrule-like fuse terminals 7 and 8, is shown in connection with my improved terminal contacts 9 and 10. The base portions of these contacts are provided with the slots 11 and 12, for receiving the screws 13 and 14. The slot 11 is herein shown to be disposed crosswise of the contact, while the slot 12 is disposed longitudinally at its contact, these being details which may be varied to any desired extent. It will be understood that the screws 13 and 14 tap into the circuit contact binding posts or other members to which the ends of the circuit wires are attached or connected. The body portions 17 and 18 of the terminal contacts 9 and 10 are made to embrace the fuse terminals 7 and 8, and can be moved longitudinally thereon; and the body portions 17 and 18 of the terminal contacts are clamped and fixed to place upon the fuse terminals by means of the screws 20, either before or after the terminal contacts have been located in position on the circuit contacts.

In the modification shown in Figs. 4 and 5, the fuse terminals 25 and 26 are provided with screw threads which fit the body portions 27 and 28 of the terminal contacts 30 and 31. The base portions 32 and 33 are or may be similar to the corresponding portions 9 and 10 of the preceding figures, and obviously these base portions may be flattened as herein shown, or may be curved, or in any other way adapted to conform to and clamp upon their associated supports. The contacts 30 and 31 are herein shown as being adapted to be made from sheet metal, the extension being cupped or struck-up by dies from the flat sheet of metal from which the terminal contact is made. The body portions 27 and 28 of the terminal contacts are tapped to receive the screw threads of the fuse terminals 25, and those screw threads



may be both of the same hand, or one may be left-handed and the other right-handed. In the latter case the contacts may be adjusted to their proper distance apart by merely turning the fuse upon its axis. But where the screw threads are for the same hand it will generally be necessary to adjust each of the terminal contacts separately.

As shown in Fig. 1, it is evident that the center-to-center distance  $c$  between the screws 13 and 14 may by this invention be varied to a considerable extent in both directions. In other words, the screws may be much nearer together or much farther apart than is shown in Fig. 1, while still contacting perfectly with the fuse terminals 7 and 8. On the other hand, with the center distance  $c$  fixed, the terminal contacts 9 and 10 will accommodate either a fuse which is considerably longer, or one which is considerably shorter, than the fuse 6. The same is true of the modification shown in Figs. 4 and 5.

In cases where it is not necessary to have the holding down screws in line with the longitudinal center of the fuse, as shown in Fig. 1, I may extend the bases 9 or 10 at one side or the other of the fuse, thereby bringing the holding screws outside of the body of the fuse and making them more readily accessible at all of the possible adjusted positions of the parts. Obviously, the shape of the base, the position of the screws, and other details of construction and arrangement may be varied in many ways to suit different environments and different conditions of service.

It will be understood that the great range of adjustment afforded by this invention may, as shown herein, be supplemented by the limited adjustment afforded by the well-known slotted construction, as herein shown, in those cases wherein the slotted construction would not be objectionable by reason of its appearance, or by reason of the extra base area which it requires. But where neatness and compactness are considerations I preferably make the base portions 10 and 33 of my improved terminal contacts either with round holes for the screws; or, where it is desirable to be able to remove the terminal contacts without entirely removing the screws, by making very short open-

ended slots, which slots, however, need not extend in a direction longitudinally of the tube; since, according to the present invention, they are not required for affording longitudinal adjustment; but when used are employed only for convenience in applying them to and removing them from the base board or slab.

I claim as my invention:—

1. An adjustable terminal inclosed fuse having in combination a tube of insulating material, ferrules on the ends of the tube, and terminal contacts provided with contact arms for engaging the ferrules, the width of said arms being less than the length of said ferrules to permit adjustment of the contacts within the lengths of the said ferrules.

2. An adjustable terminal inclosed fuse having in combination a tube of insulating material, ferrules on the ends of the tube, terminal contacts provided with contact arms for engaging the ferrules, the width of said arms being less than the length of said ferrules to permit adjustment of the contacts within the lengths of the said ferrules, and means for securing the said arms in their adjusted position.

3. An adjustable terminal inclosed fuse having in combination a tube of insulating material, ferrules on the ends of the tube, and terminal contacts provided with contact arms having a threaded engagement with the ferrules.

4. An adjustable terminal inclosed fuse having in combination a tube of insulating material, ferrules on the ends of the tube having their exterior surface screw-threaded, and terminal contacts provided with contact arms fitting the threads of said ferrules, the width of said arms being less than the length of said ferrules to permit adjustment of the contact arms within the length of the ferrules.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 5th day of March, 1906.

VICTOR F. MORGAN.

Witnesses:

CATHERINE M. HONISS,  
WM. H. HONISS.