

E. F. CHYTRAUS.  
 DEVICE FOR CUTTING INSULATION FROM CONDUCTORS.  
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969,339.

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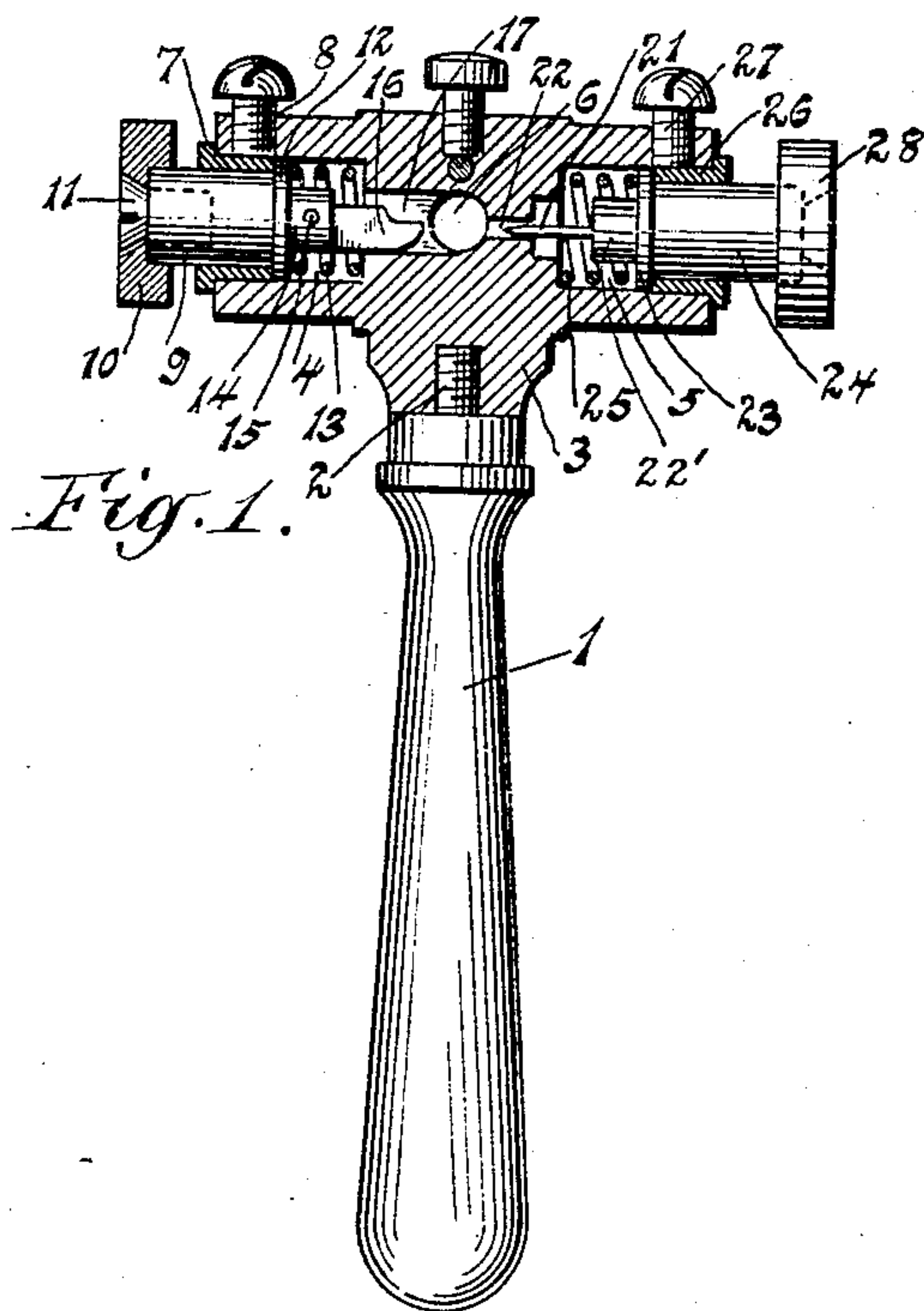


Fig. 1.

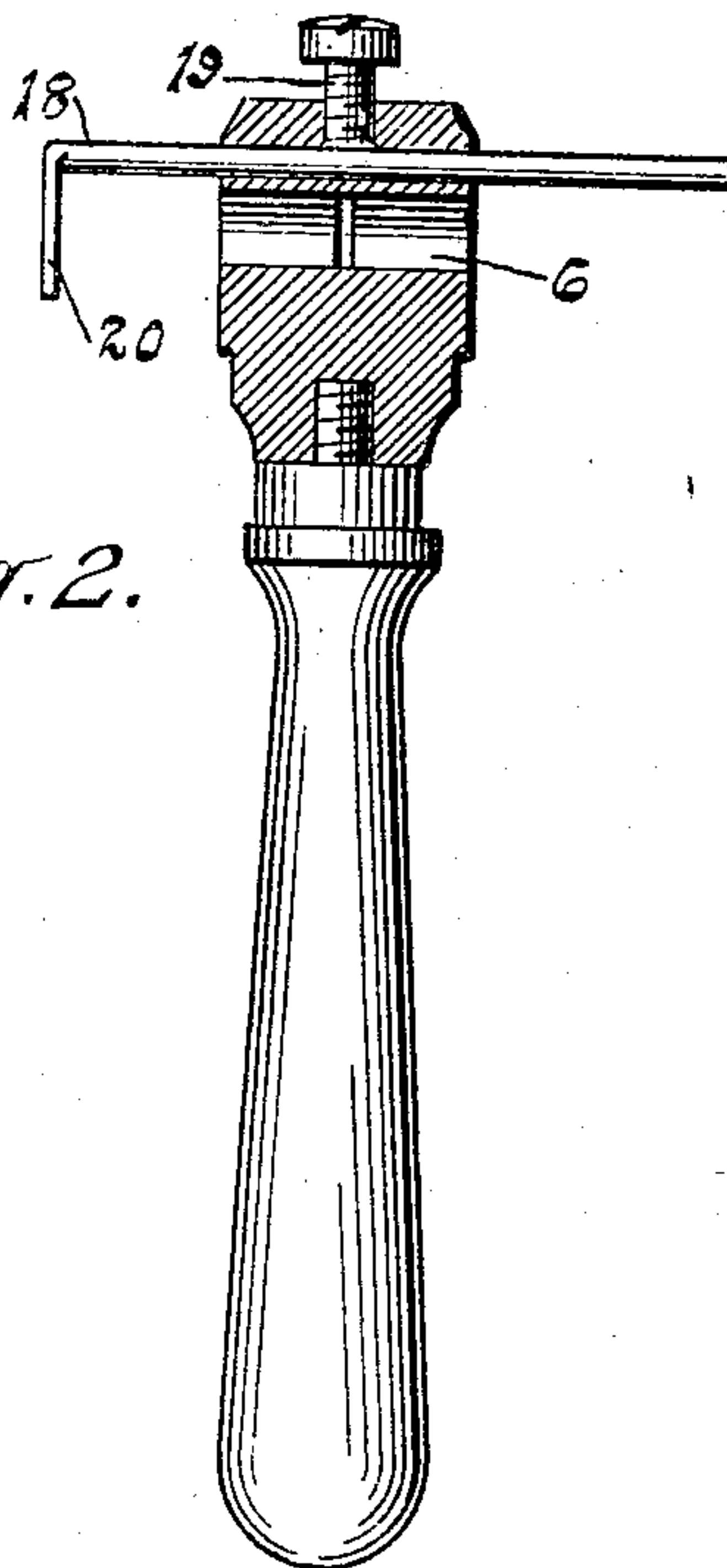


Fig. 2.

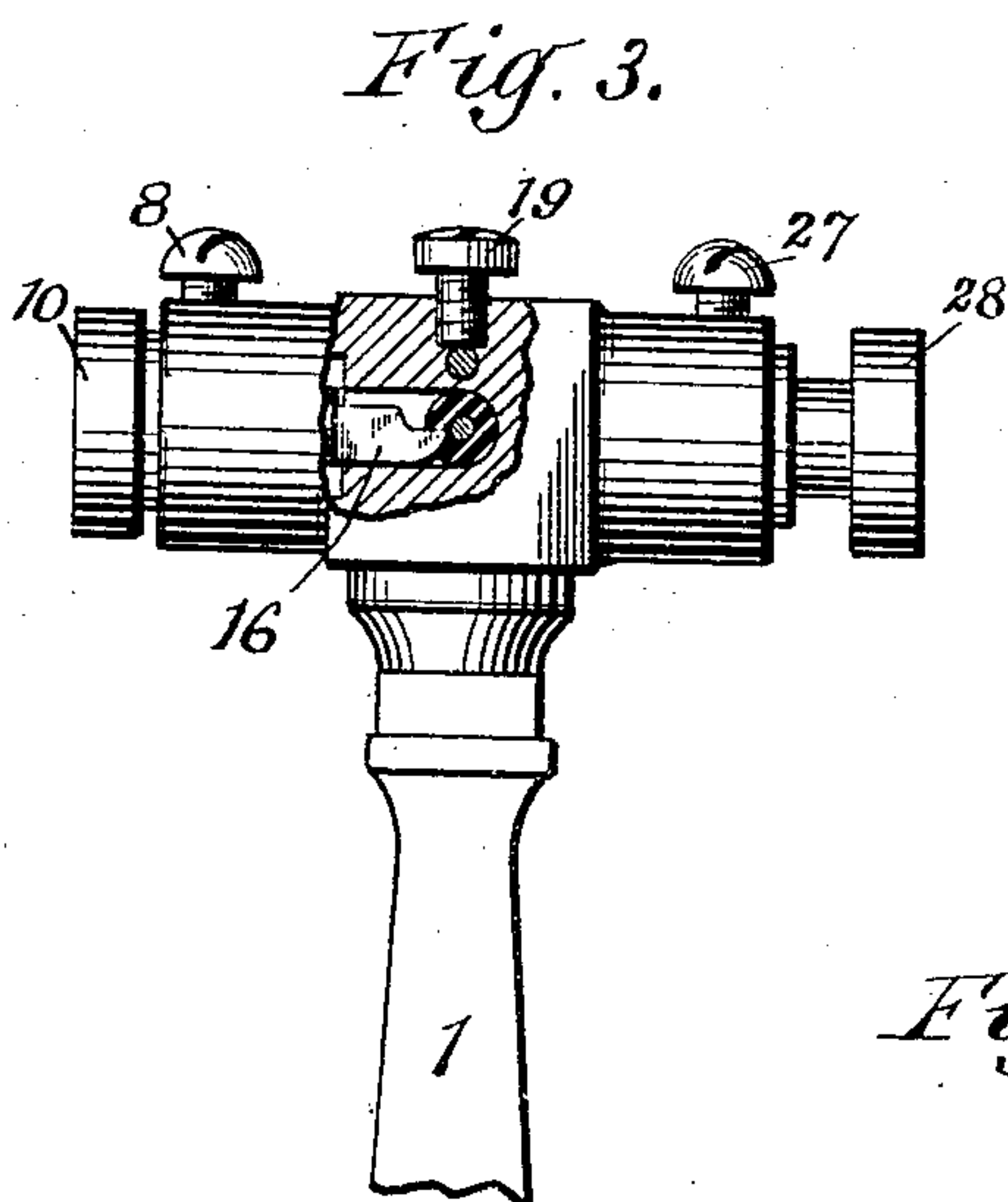


Fig. 3.

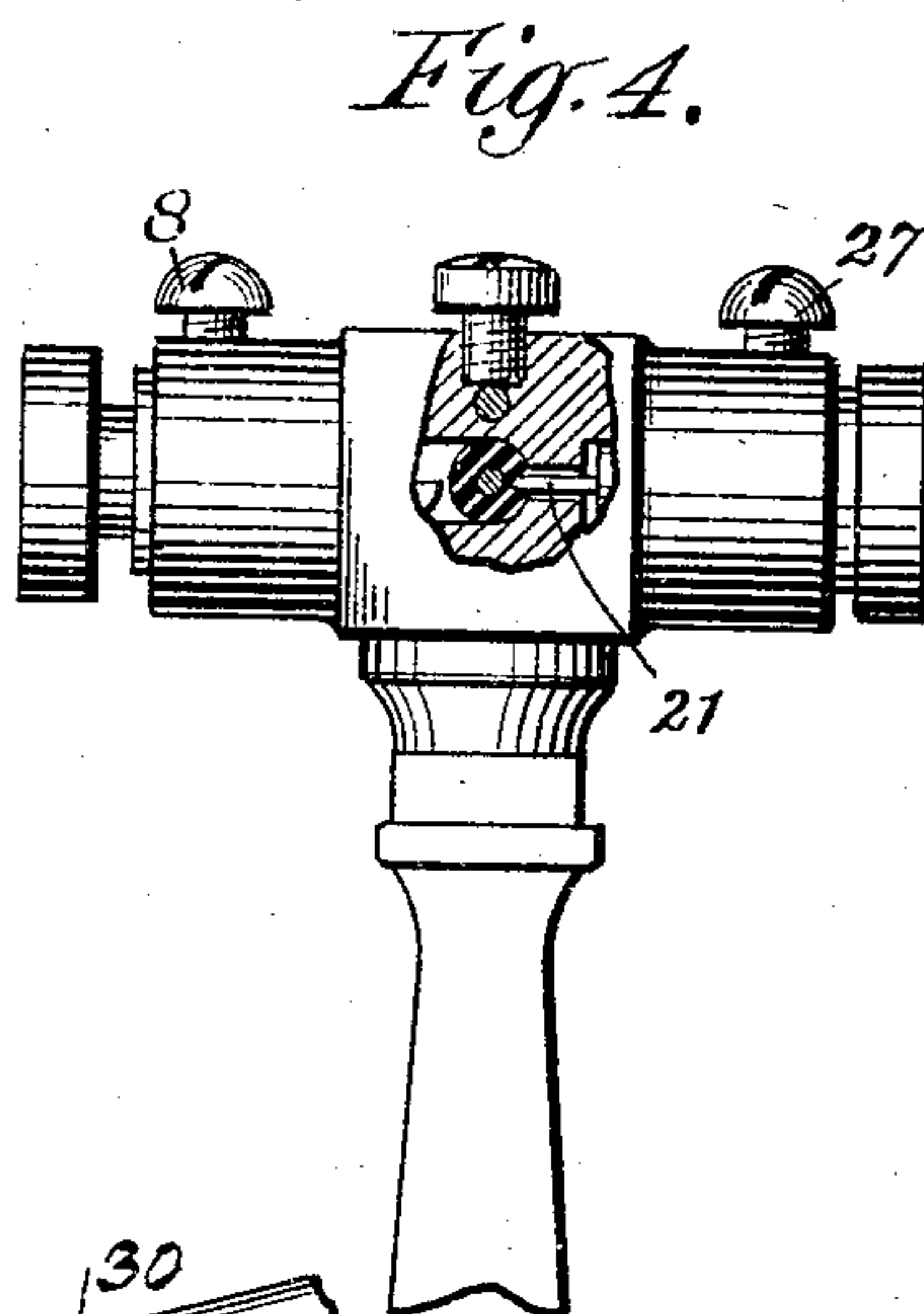


Fig. 4.

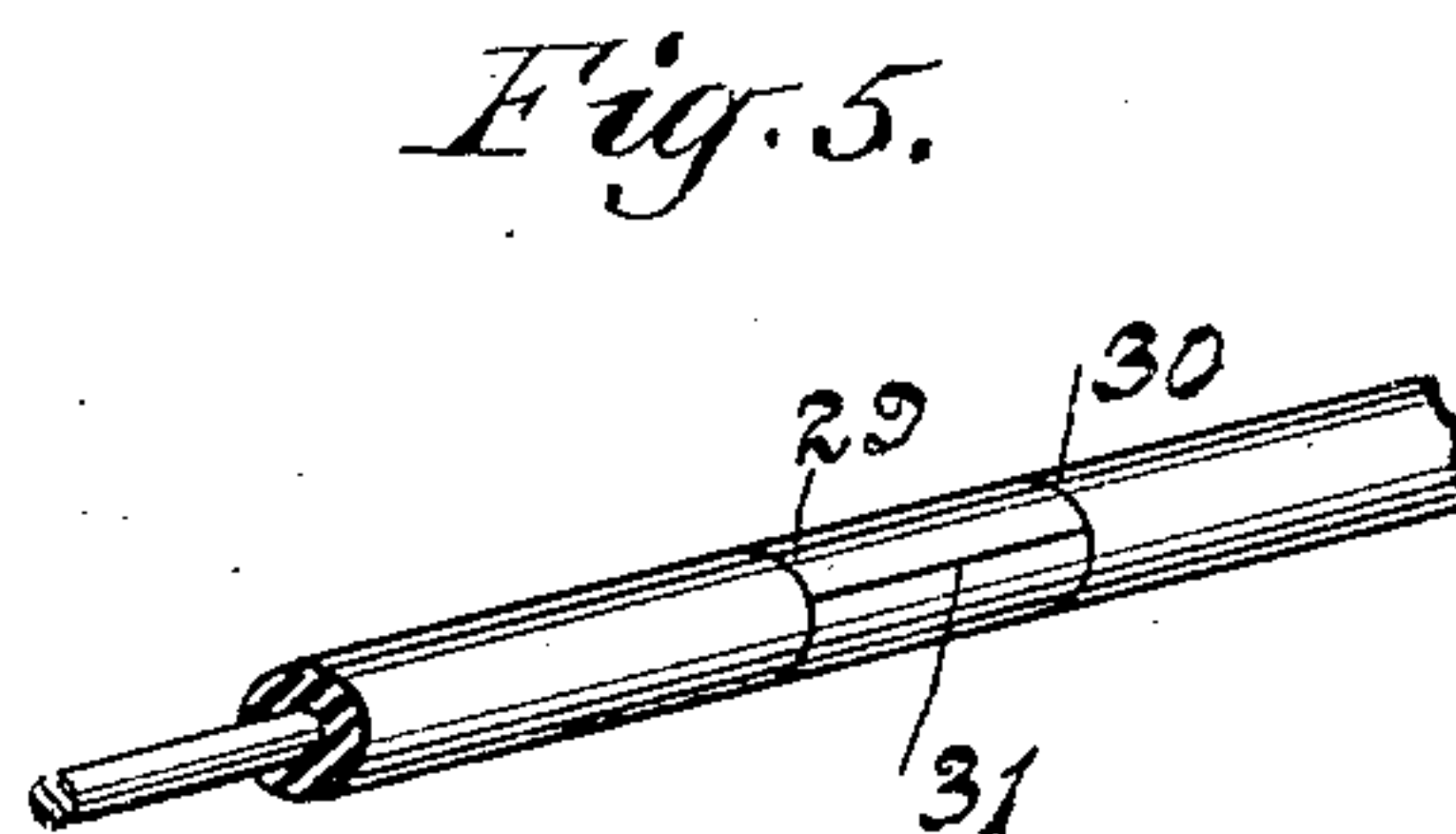


Fig. 5.

WITNESSES

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# UNITED STATES PATENT OFFICE.

EMIL F. CHYTRAUS, OF YONKERS, NEW YORK, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DEVICE FOR CUTTING INSULATION FROM CONDUCTORS.

969,339.

Specification of Letters Patent.

Patented Sept. 6, 1910.

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*To all whom it may concern:*

Be it known that I, EMIL F. CHYTRAUS, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Devices for Cutting Insulation from Conductors, of which the following is a specification.

My invention relates to apparatus for removing insulation from wires or other conductors, and its object is the provision of a device of this kind which shall be simple and efficient and capable of being operated with facility.

More particularly it is the object of the present invention to provide in a single device cutting mechanism for cutting the insulation on a wire both circumferentially and longitudinally, so that said insulation may be easily removed from the wire either at the end thereof or at an intermediate portion.

Other objects of the invention will appear hereinafter, the novel combinations of elements being set forth in the appended claims.

Referring to the accompanying drawings, Figure 1 represents an elevational view of my device showing the details thereof in vertical section; Fig. 2 is a similar view taken at right angles to Fig. 1; Fig. 3 is an elevational view of my device with a portion broken away and an insulated wire inserted into position where one of the knives might cut the insulation circumferentially; Fig. 4 is a view similar to Fig. 3, but showing the other knife for cutting the insulation longitudinally; and Fig. 5 is a perspective view of an insulated wire with an end portion removed and an intermediate portion cut in readiness to be removed.

Referring now particularly to Fig. 1, it will be seen that to a handle 1 is rigidly connected, as by means of the screw 2, the body portion or knife carrier 3. The latter in this instance is shown as a single casting provided with opposite recesses 4 and 5 and a transverse passage or opening 6. Into the recess 4 extends a sleeve or bushing 7 which is held in adjusted position by the set-screw 8 which in this instance extends from the upper surface of the carrier 3 to the sleeve 7, although said set-screw may be in any position desired so long as it can be brought into engagement with said sleeve. Extending through the latter is a push-rod 9, to the

outer end of which is fastened a thumb-piece 10, as by means of a screw 11. To the inner end of the rod 9 is connected a collar 12 substantially of the same diameter as the recess 4 and movable therein against the action of the spring 13. It will therefore be evident that the spring 13 tends to move the push-rod 9 to its outermost position, as illustrated in Fig. 1, and that the push-rod 9 may be moved inwardly against the action of the spring 13 until the thumb-piece 10 strikes against the outer collar of the sleeve 7. Therefore the position of the sleeve 7 will determine the extent of inward movement of the push-rod 9.

To the inner end of the rod 9 is connected an auxiliary rod or projection 14 which may be integral with the rod 9 and collar 12 if desired. Connected to the part 14, as by means of a rivet 15, is a knife 16, preferably of steel, whereas the other parts heretofore mentioned are preferably of brass with the exception of the spring 13 which is preferably composed of iron or steel. The knife 16 may be shaped as desired, but should be sharpened at its end so as to readily cut the insulation on a wire which may be inserted through the opening 6. The knife 16 is movable in a slot 17 substantially perpendicular to and connecting the opening 6 with the recess 4. This slot limits the movement of the knife 16 to a substantially straight line movement, in that it prevents rotation thereof. This will insure that when the insulated wire is inserted in the opening 6 and the piece 10 pressed by the thumb so that the knife 16 will be injected into the insulation and the handle 1 then rotated or the wire rotated, the insulation will be cut circumferentially. Inasmuch as some insulation is thicker than others, the inward movement of the knife 16 should be adjusted as required by shifting the position of the sleeve 7 and holding it in such position by the set-screw 8.

When the wire is inserted through the opening 6, the length of insulation to be cut off may be determined quickly by the measuring rod 18 which has previously been adjusted and fixed in position by the set-screw 19. Marks on the rod 18 may be used to indicate the length of the insulation that will be cut by the knife 16 when the end of the wire engages the angular projection 20. Obviously the rod 18 may be of any length



desired, but in most instances only short lengths of insulation need be cut from the wire so that electrical connections can be made. Heretofore this has usually been  
 5 done by means of a pocket knife, which is always more or less unsatisfactory.

After the knife 16 has been injected into the insulation so as to just touch or nearly touch the wire as indicated in Fig. 3 and the  
 10 tool and wire are relatively rotated, a circumferential cut is made at a point determined by the measuring device comprising the rod 18 and the abutment 20. In some instances this is sufficient where the insula-  
 15 tion does not cling to the wire, to enable one to grasp the insulation after thus being cut, and pull the same from the wire. In many instances, however, it is evident that the insulation is practically cemented to the wire  
 20 and cannot be easily removed even after being thus cut circumferentially. I have therefore provided an additional knife 21 opposite the knife 16 so that after a circumferential cut is made the section of in-  
 25 sulation to be removed may be cut longitudinally, whereupon the layer of insulation may be pried or pulled off manually. In case the insulation is not cemented to the wire very firmly and the knife 21 is insert-  
 30 ed into the insulation, and thereafter the wire is pulled out of the opening 6, it will be evident that the section of the insulation may thus be slipped off the wire without cutting the same longitudinally.

35 The knife 21 is arranged in a plane substantially perpendicular to the knife 16 and is limited to movement in such a plane by the slot 22 substantially longitudinal of and which connects the opening 6 with the re-  
 40 cess 5. The knife 21 is fastened to the projection 22', which in turn is connected to the collar 23 and push-rod 24. Normally the spring 25 in the recess 5 holds the collar 23 against the inner end of the sleeve 26 which  
 45 is held in adjusted position by the set-screw 27. The inward movement of the knife 21, and hence the extent to which it may be inserted into the insulation, is limited by the thumb-piece 28 striking against the outer  
 50 end of the sleeve 26.

The size of the opening 6 should be such as to accommodate the largest wires ordinarily used, and then when insulation is to  
 55 be cut from smaller wires the sleeves 7 and 26 should be adjusted accordingly, and so that the insulation is cut to the wire without injuring the latter.

When it is desired to remove an intermediate portion of the insulation it may be cut  
 60 circumferentially at two predetermined points as indicated at 29 and 30 in Fig. 5, this being done by means of the knife 16. The abutment 20 may then be moved out of the way by loosening the screw 19 and  
 65 rotating the rod 18, 90° or more. Then by

simply grasping the handle 1 and with the thumb of the same hand pressing the knife 16 inwardly and effecting relative rotation between the wire and the carrier 3, the cir-  
 70 cumferential cuts may be easily and quickly made. Then by changing the position of the handle 1 in the hand about 180°, the thumb of the same hand may be used to press inwardly the rod 24 so as to inject the  
 75 knife 21 into the insulation at one of the circumferential cuts 29 or 30, and then moving the wire longitudinally through the passage 6 or vice versa, when the longitudinal cut 31 will result. After the insulation  
 80 has been cut as indicated in Fig. 5, the portion between the cuts 29 and 30 may be removed easily by prying it off from the wire, beginning at the cut 31. This may usually  
 85 be done by inserting the finger nail in the cut 31 and prying a portion off until it can be grasped, whereupon it may be pulled off the wire and the latter brightened, if neces-  
 90 sary, for making a good electrical connection to some other conductor.

Obviously those skilled in the art may  
 95 make various changes in the details and arrangement of parts without departing from the spirit and scope of my invention, and I desire therefore not to be limited to the precise construction herein disclosed.

Having thus fully described my invention, what I claim and desire to have protected by Letters Patent of the United States is:—

1. The combination with a knife, of a  
 100 carrier for said knife having a slot for limiting the movement of said knife in a predetermined direction and having also a passage for the insertion of insulated wire in the path of movement of said knife, means  
 105 for moving said knife into said passage, and mechanism for adjusting the extent of movement of said knife into said passage.

2. The combination with a movable knife, of a carrier having a slot limiting the move-  
 110 ment of said knife in a predetermined plane and having also a passage for the insertion of insulated wire, a handle connected to said carrier, and a thumb-piece connected to said knife.  
 115

3. The combination with a carrier, of a cutter, means for moving said cutter into a passage or opening extending through  
 120 said carrier, and means for measuring the length of insulation or predetermining the point of cutting the same on an insulated wire inserted through said passage.

4. The combination with a carrier, of a plurality of cutters differently arranged but  
 125 each movable into a passage or opening extending through said carrier, and separate means for actuating said cutters.

5. The combination with a handle, of a carrier connected thereto and having a  
 130 transverse passage for the insertion of in-



5 insulated wire, two cutters, one for cutting the insulation circumferentially and the other for cutting the same longitudinally, and separate devices for operating said cutters.

10 6. The combination with a carrier having a transverse passage or opening for the insertion of insulated wire, of a push-rod extending into a longitudinal recess in said carrier, a knife or cutter connected to said push-rod and extending into a slot communicating with said passage, a stop device on said push-rod, a sleeve in said recess to limit the outward movement of the push-rod when engaged by said stop device, a spring in said recess for holding said cutter in a predetermined position, a thumb-piece for moving said rod and cutter inwardly to cause the latter to enter said transverse passage, and means for holding the sleeve in adjusted position to vary the length of stroke of the push-rod to its innermost position.

25 7. The combination with a handle, of a carrier connected thereto and having a transverse passage or opening for the insertion of insulated wire, two cutters, one lying in a slot in said carrier substantially perpendicular to said passage, the other lying in a slot substantially longitudinal of said passage, and separate devices for moving said cutters inwardly into the insulation to enable the latter to be cut circumferentially by one cutter and longitudinally by 35 the other.

8. The combination with a handle, of a carrier connected thereto and having a longitudinal passage for the insertion of insulated wire, two cutters, one for cutting the insulation circumferentially and the other 40 for cutting the same longitudinally, and spring-pressed push devices, one for moving one of said cutters and the other for moving the other.

9. The combination with a handle, of a 45 carrier having a transverse passage for the insertion of an insulated wire, of a cutting member for cutting the insulation circumferentially, an additional cutting member for cutting the insulation longitudinally, 50 and separate adjustable manual actuating devices for the cutting members.

10. In a wire-working tool for cutting and removing the electric insulation from a wire, the combination of a double-ended carrier, having a transverse seat for insertion of 55 the wire, a cutter in one end of the carrier to cut the insulation circumferentially, and a cutter in the other end of the carrier to cut the insulation longitudinally, the points of 60 the two cutters being on opposite sides of the seat for the wire.

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

EMIL F. CHYTRAUS.

Witnesses:

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JAMES D. IVERS.