

No. 626,769.

Patented June 13, 1899.

J. H. PRESTON.

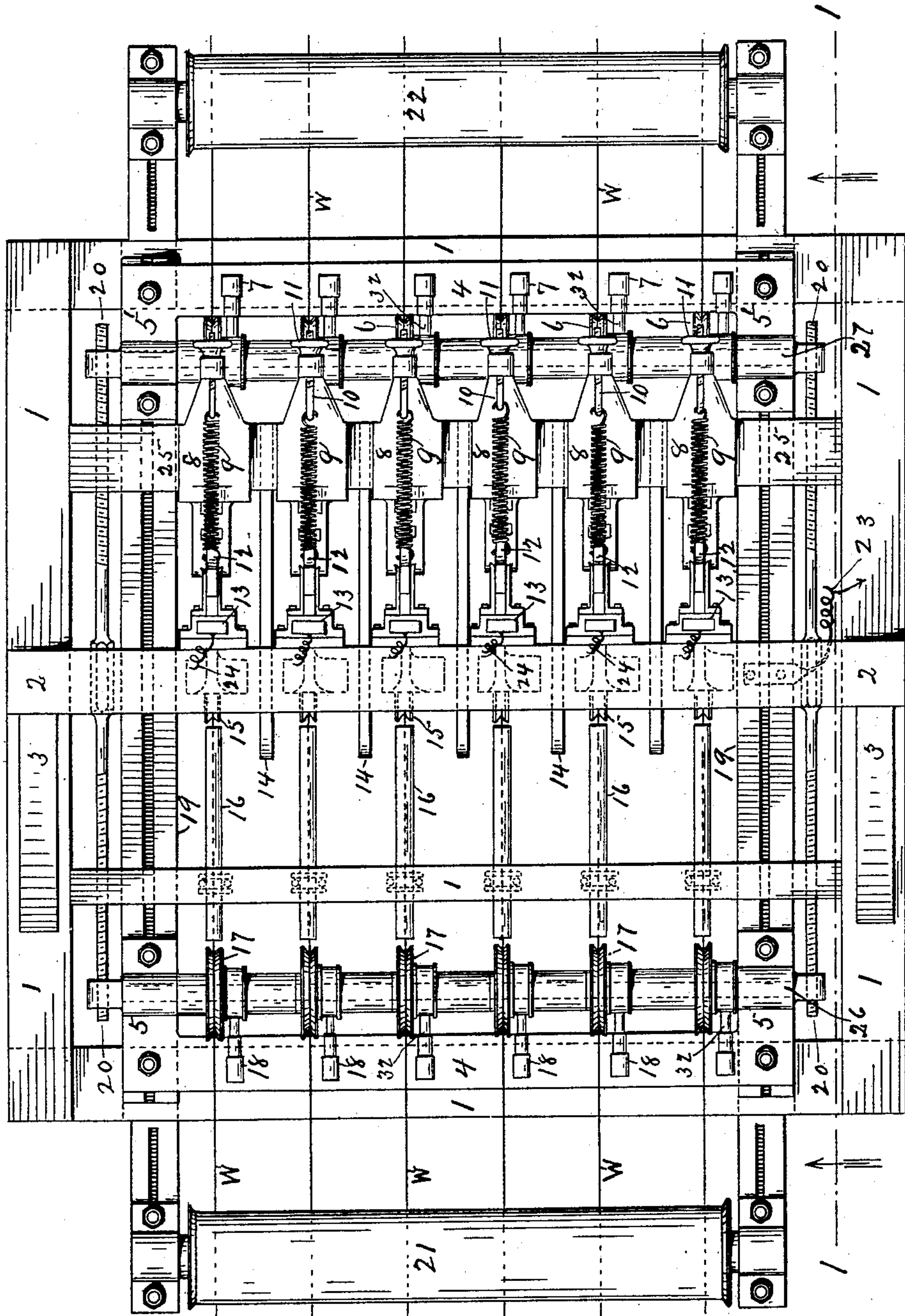
APPARATUS FOR ELECTRICALLY ANNEALING WIRE OR RODS.

(Application filed Oct. 12, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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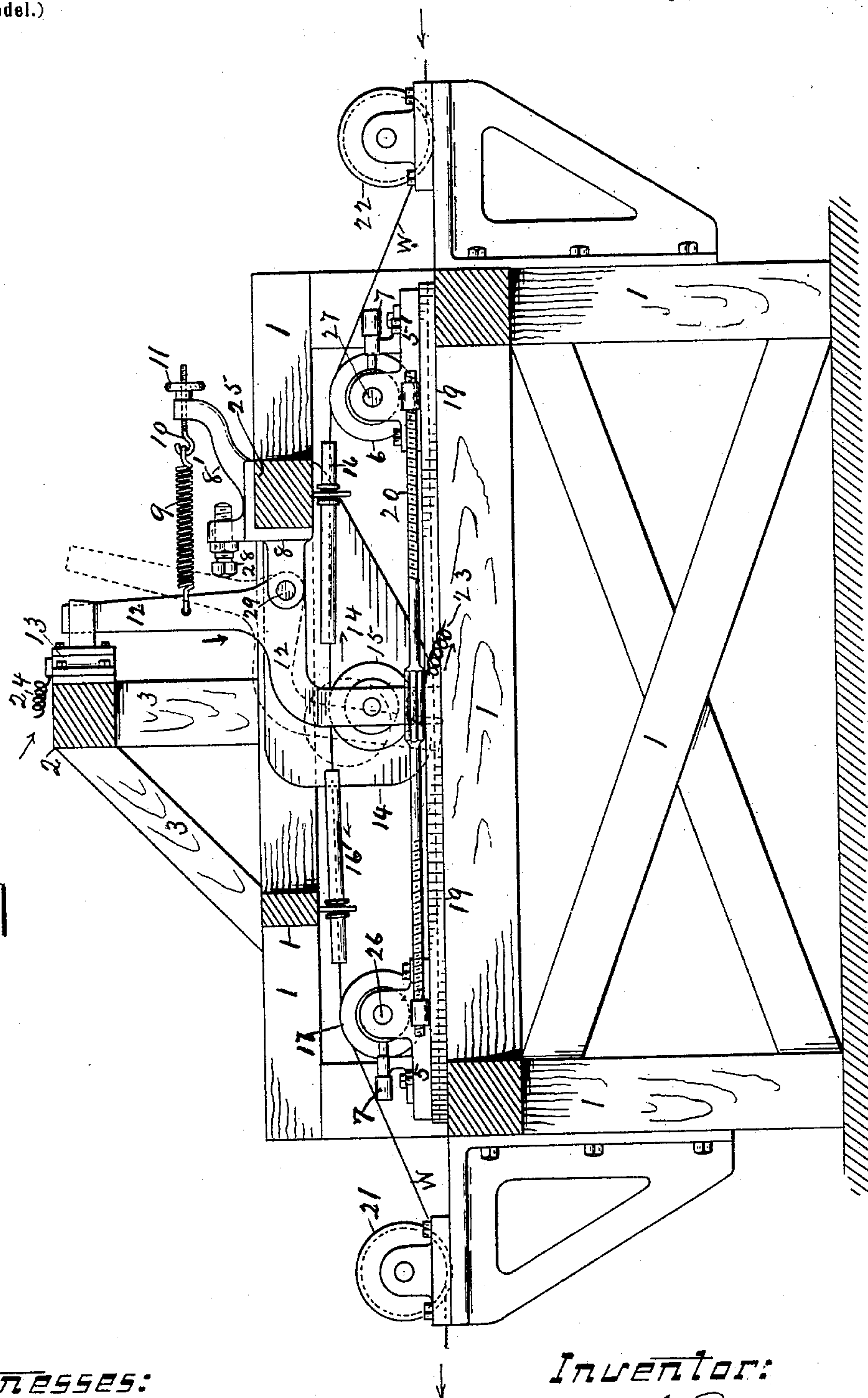
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3 Sheets—Sheet 2.

(No Model.)

Fig. 2.



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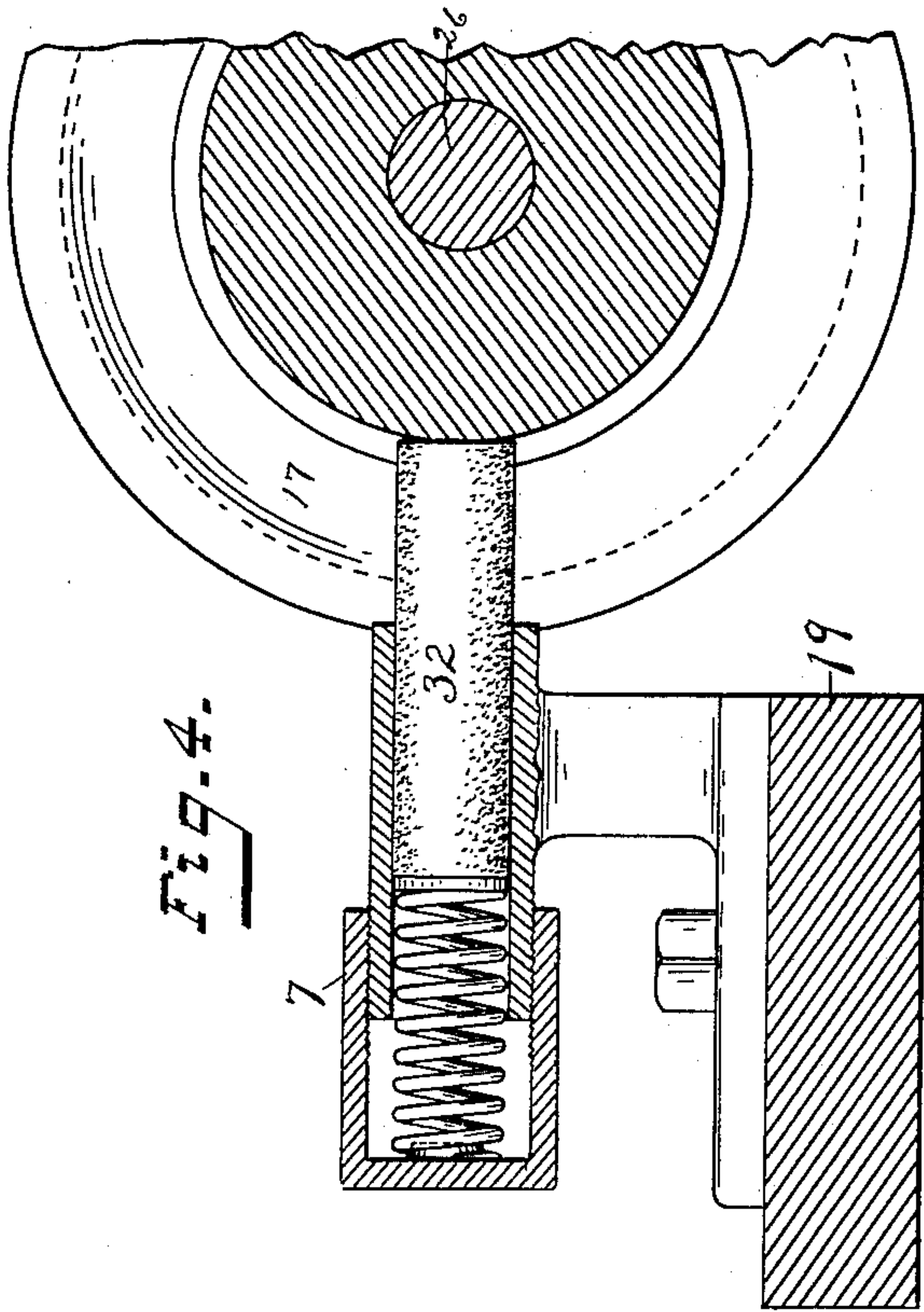


Fig. 4.

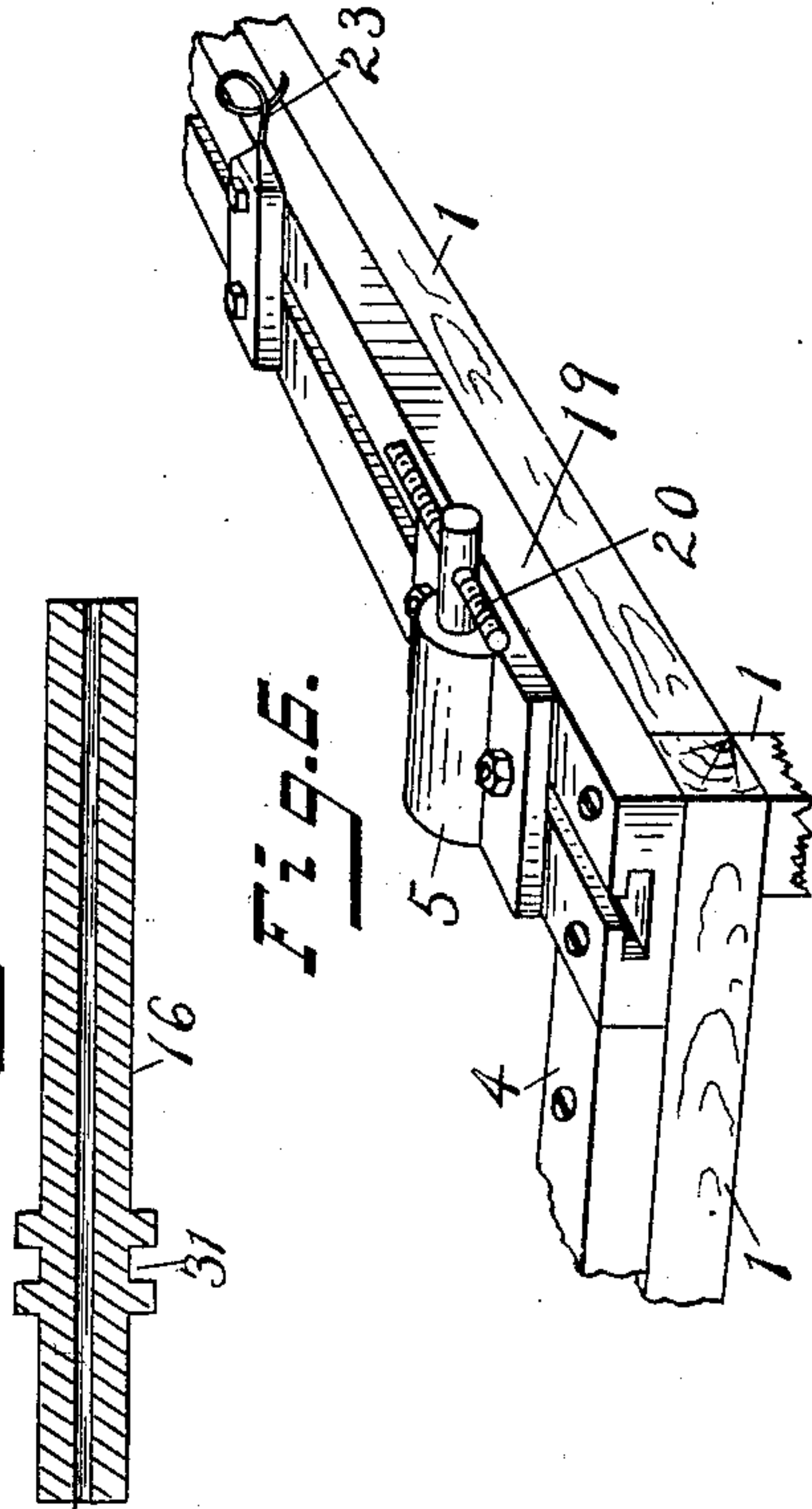


Fig. 5.

Fig. 6.

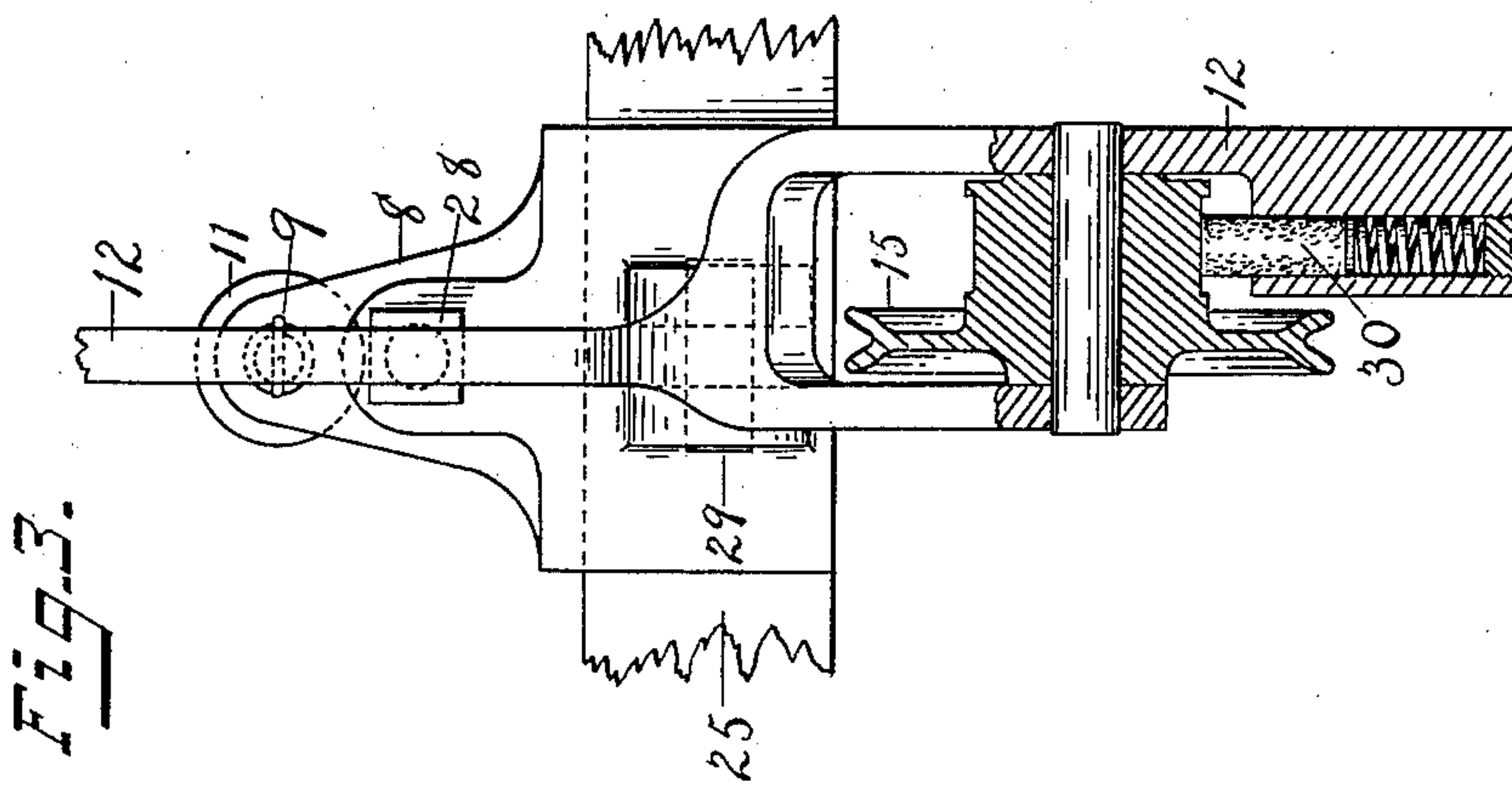


Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR ELECTRICALLY ANNEALING WIRE OR RODS.

SPECIFICATION forming part of Letters Patent No. 626,769, dated June 13, 1899.

Application filed October 12, 1898. Serial No. 693,310. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. PRESTON, a citizen of the United States of America, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Apparatus for Electrically Annealing Wire or Rods, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a plan view of the machine. Fig. 2 is a vertical longitudinal section of Fig. 1, taken on line 1, looking in the direction of the arrow. Fig. 3 is a front view of one of sheave-wheel-holding arms and its supporting-bracket, the sheave-wheel and lower part of the arm being shown in central section and the upper part of the arm being broken away; Fig. 4, a sheave-wheel, partly broken away and partly in section, also a contact-brush, its holder, and a section of the bed-plate of the machine, the brush-holder, the hub of the sheave-wheel, and the bed-plate being shown in section. Fig. 5 is a longitudinal section of one of the sleeves through which the wire to be annealed is drawn, and Fig. 6 is a cross-section of one of the bed-plates and showing the line-wire connection therewith.

My invention relates to certain improvements in a machine or apparatus whereby rods, wire, or ribbons of metal are heated by means of an electric current for the purpose of annealing them as the wire or rod is drawn or otherwise passed through the apparatus.

Referring to the drawings, 1 shows a suitable frame, made, preferably, of wood, and supports on its top, near each side, respectively, a plate 19, made of some suitable material, for an electric conductor. The said two conductor-plates 19 are connected with each other at each end by means of the metal cross-bars 4, as shown in Fig. 1, for the purpose of more securely maintaining them in their proper places. Said conductor-plates are provided at each end on their upper side with sliding boxes 5 5', the boxes connected with each plate being connected by means of a screw-threaded rod 20, by means of which the boxes may be adjusted to or from each other. Said conductor-plates 19 are provided with a longitudinal T-groove, as shown more particularly in Fig. 6, for receiving a corresponding T-shaped integral portion of the

boxes 5 5' for adapting said boxes to slide on said conductor-plates.

27 is a shaft having its ends journaled, respectively, in the boxes 5', said shaft being shown in the broken lines in Fig. 1 and in full lines in Fig. 2. Said shaft 27 has on it a series of sheave-wheels 6, loosely sleeved thereon, so that each sheave may rotate separately from the other. Each one of said sheaves has an integral extending hub, against which carbon brushes 32 impinge, as shown particularly in Fig. 4, said brushes being seated on a coil-spring in the brush-holders 7 for the purpose of feeding forward the carbon brush as it may wear away.

26 is a shaft arranged parallel with shaft 27 and journaled in boxes 5, resting on the opposite ends of said conducting-plates. Said shaft 26 has arranged on it a series of sheave-wheels 17, loosely sleeved thereon, so that each sheave may rotate separately from the other. Each one of said sheave-wheels has an integral extending hub, against which carbon brushes such as are shown at 32 in Fig. 4 impinge, said brushes being seated in holders 18 and seated on coil-springs for feeding forward the carbon brushes as they may wear away.

15 are a series of sheave-wheels journaled in the forked inner arm of the bell-cranks 12 in such position that said sheaves will be located centrally between the sheaves 6 and 17. Said series of bell-cranks 12 are respectively pivotally connected at 29 to brackets 8, secured, respectively, to a cross-beam 25 of the frame 1. The outer or upper extending arm of said bell-crank 12 is connected with an upwardly-extending arm 8' of bracket 8 by means of a coil-spring 9, through the medium of screw-threaded hook 10, having a thumb-nut 11 for regulating the tension of said coil-spring. The upper arm of said bell-crank 12 is intended to be brought into contact with an electric switch 13, when tension is placed on the wire W, by placing a wire to be annealed thereon. When the said wire is not on said sheave 15, so it is relieved of the weight thereof, the coil-spring 9 will disengage said bell-crank from said switch, and thus break the electric circuit. The switches 13 are supported on the cross-beam 2, supported on the frame 1, by means of the ports



3, and each switch is intended to be connected with the line-wire. An adjustable stop 28, attached to bracket 8, serves to regulate the degree of movement of the bell-crank 12.

5 The inner or lower arm of bell-crank 12 is forked, as shown in Fig. 3, and the sheave-wheel 15 is journaled in said forked end, as shown in said figure. One of said forked members is barreled for the purpose of carrying a carbon brush 30, seated on a coil-spring located in the bottom of said barrel, for the purpose of holding said brush in contact with the hub of said sheave and for feeding forward said brush as it may wear away.

15 16 16 are a pair of tubular heat-holders through which the wire or rod to be annealed passes and by means of which heat is retained in the wire. These tubular heat-holders are formed with a pair of annular flanges 31, as shown, forming an annular groove between them. A long staple fits said groove and is driven into the frame 1 above, so as to prevent end movement of the heat-holders and permit vertical movement to accommodate them to the line of the wire passing through them.

21 and 22 are drums arranged one at each end of the machine on brackets and journaled in suitable boxes on said brackets.

30 24 represents a part of the line-wire through which the electric current enters the machine, and 23 represents a part of the feeder-wire through which the electric current leaves the machine. The remainder of the feeder-wire is not necessary to be shown, as it is ordinary; but it is intended to have the power for generating an electric current located in the circuit of the line-wire.

40 This apparatus is intended to be used in connection with other devices used in the process of drawing and galvanizing wire or rods.

In operation the wire or rod W to be annealed enters the machine under the drum or roller 22, from thence over sheaves 6, 15, and 17, and out under drum or roller 21, and is intended to be drawn through the machine. It also passes through the tubular heat-holders 16 to retain the heat in the wire as long as possible. As many wires or rods can be placed in the machine as there are sheave-wheels in the train and as many as the strength of the electric current can anneal at one time. The weight of the wire or rod W to be annealed, together with the tension thereon, will bring sheave-wheel 15 down so as to bring the upper arm of bell-crank 12 in contact with switch 13, and thus close the electric circuit, so it will flow through the machine in the direction of the arrows, the wire W to be annealed forming a part of the circuit through the machine. The flow of the electric current will be through switch 13, bell-crank 12, and its sheave 15 to the wire W, thence through said wire in each direction to the sheave-wheels 6 and 17, respectively, from thence to the conductor-plates 19, and from

thence out of the machine through the line-wire 23. On the passage of the electric current through the machine over the wire W it will be heated to thoroughly anneal it in its part between sheave-wheels 6 and 17, and thus throughout its length as it passes through the machine. It is intended that as the parts in contact with the wire to be annealed are supported on the wooden frame that the wooden frame will act as an insulator; but, if desired, any insulating material may be used between the wooden frame and the other parts of the machine and that the wire W in its part outside of the machine may be insulated in any manner desired. Should the wire W run off one of the sheave-wheels or break, the current would be instantly broken by reason of sheave 15 being relieved of weight, and thus permit the coil-spring 9 to open the switch, as indicated by broken lines in Fig. 2. A division-board 14 is arranged between the wires W, so as to prevent their contact in case of breakage. The carbon brushes are used for relieving the journals and boxes of the sheave-wheels from the injury they might receive in consequence of the electric current passing through them. By thus causing the wire W to be annealed to form a part of the electric circuit through the medium of central sheave and its switch connection with the feeder-wire the electric current must pass over the wire W in each direction from sheave 15 to the sheaves 6 and 17 and out through conductor-plate 19 to line-wire 23, and as the electric current passes over the wire W it will be heated and thus annealed to any degree desired, according to the strength of the electric current.

By the use of the central contact-sheave the electric circuit is established through the wire to be annealed to a much greater certainty than if it simply formed part of a circuit between the sheaves 6 and 17, so that the improvement consists chiefly in providing three points of contact with the wire to be annealed, and in such manner that the electric current will flow over the wire from the central point of contact in either direction to the other points of contact and out to the feeder-wire, thus causing the wire to be annealed to form a part of the electric circuit. The electric current through the machine may be reversed in the direction of its flow, if desired, with the same result. By this arrangement of parts it will be observed that there is no flow of the electric current outside of sheaves 6 and 17, so that the wire or rod beyond said sheaves is not electrically charged and may be handled without danger.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows, to wit:

In the apparatus for electrically annealing wire or rods, the combination of the sheave-wheels 6 and 17, the means for electrically connecting said sheave-wheels, the sheave-wheel 15 arranged centrally between and in



line with said sheave-wheels 6 and 17, the bell-crank 12 and switch 13 and the means for opening and closing said switch, said sheave-wheels being adapted to have electric contact  
5 with the wire or rod to be annealed and thus form an electric circuit over said wire flowing in each direction from the sheave-wheel 15,

all arranged to operate substantially as and for the purpose set forth.

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Witnesses:

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