

W. C. WINFIELD.  
ELECTRICAL SPOT WELDING MACHINE.  
APPLICATION FILED OCT. 8, 1909.

978,418.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

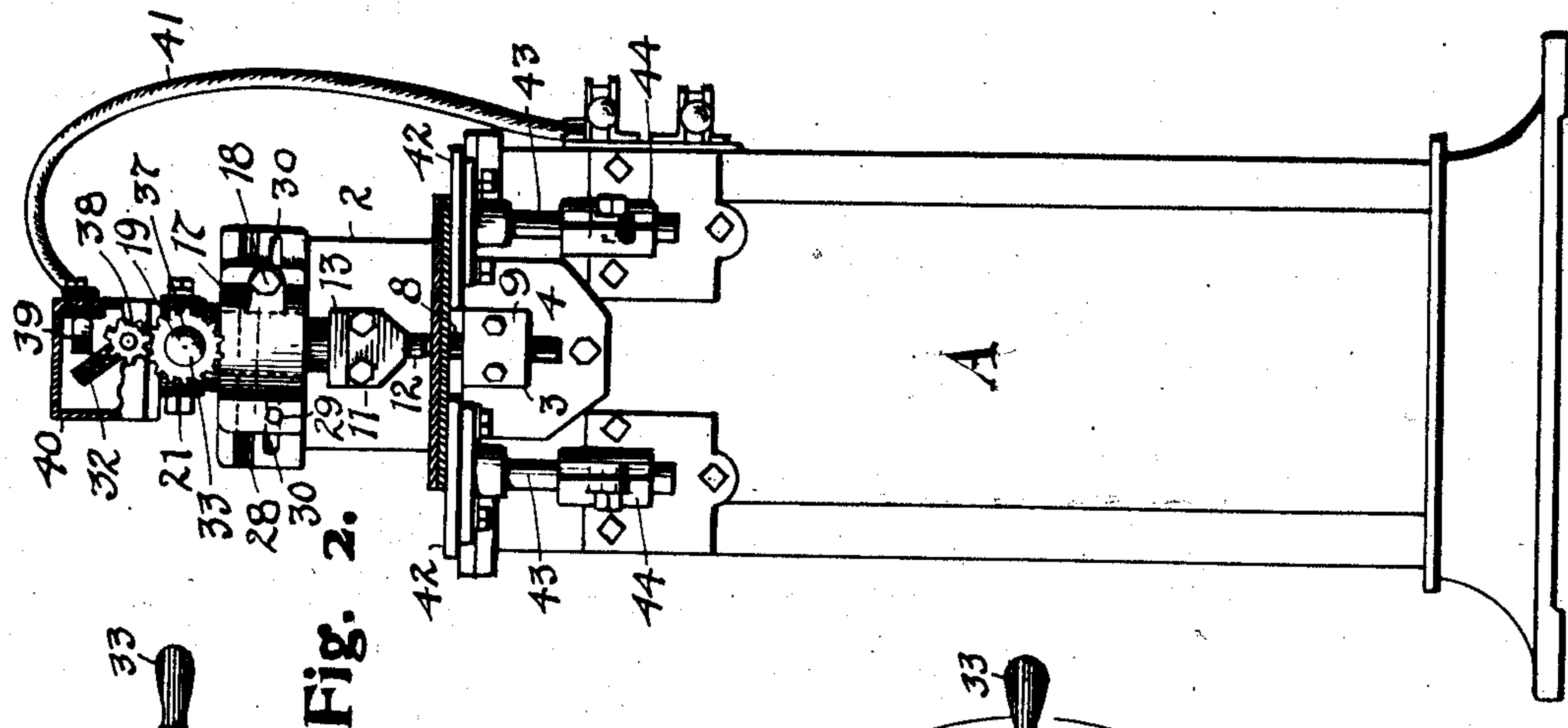


Fig. 2.

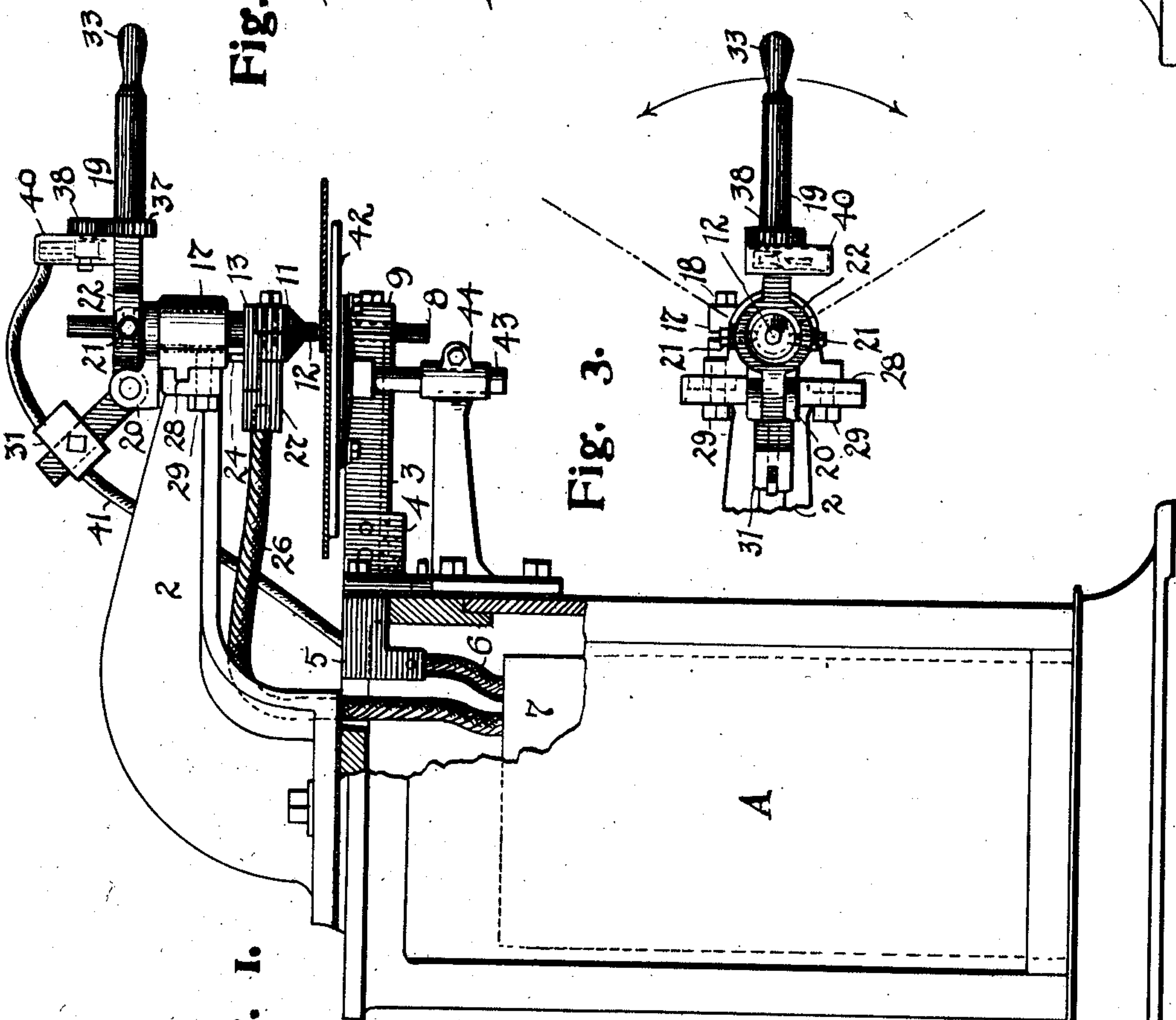


Fig. 3.

ATTEST  
E. M. Fisher  
J. C. Muesen.

Fig. 1.

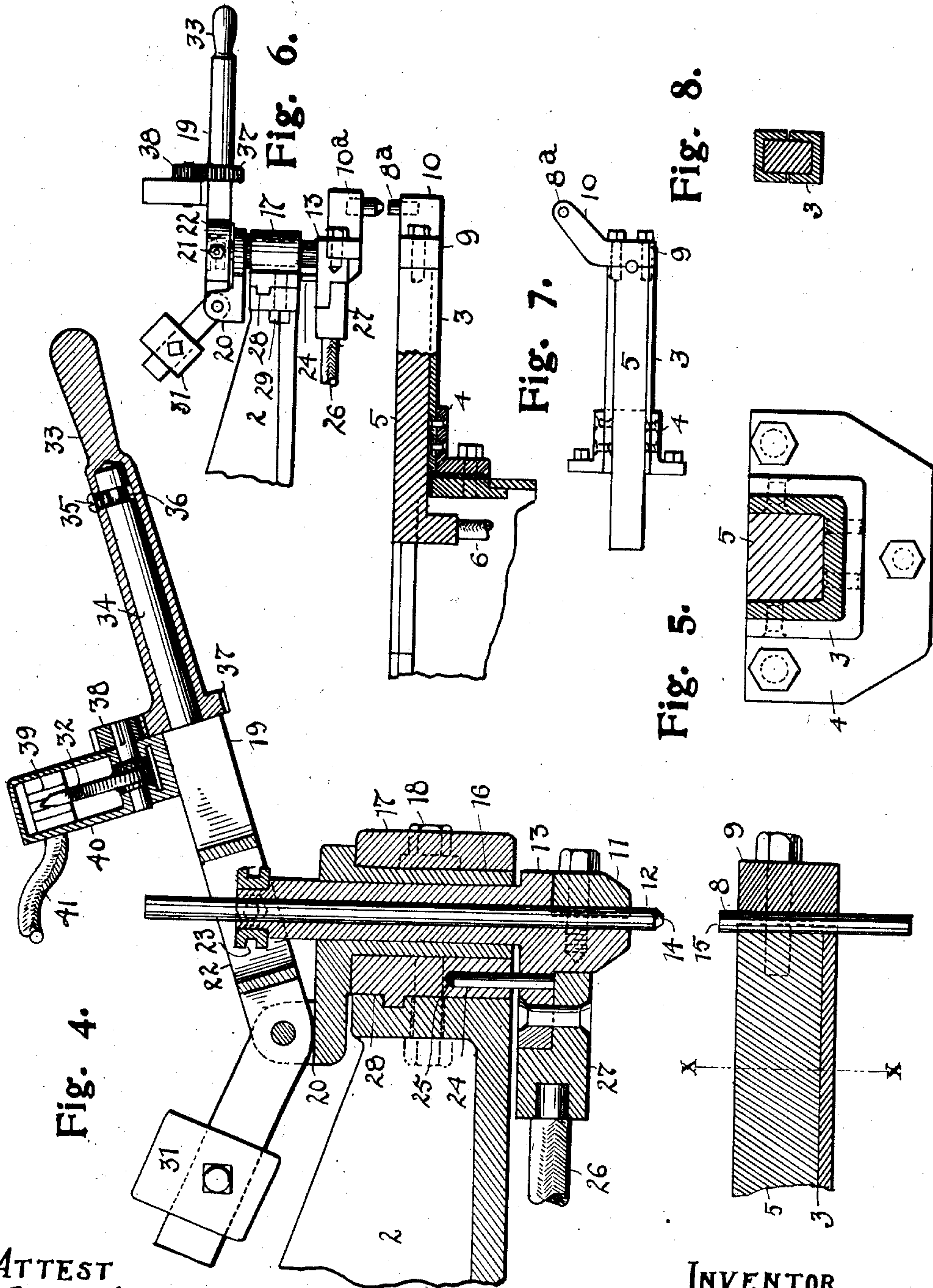
INVENTOR  
WILLIAM C. WINFIELD  
BY Fisher & Muesen ATTYS

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# UNITED STATES PATENT OFFICE.

WILLIAM C. WINFIELD, OF WARREN, OHIO, ASSIGNOR TO THE WINFIELD ELECTRIC WELDING COMPANY, OF WARREN, OHIO.

ELECTRICAL SPOT-WELDING MACHINE.

978,418.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed October 8, 1909. Serial No. 521,681.

*To all whom it may concern:*

Be it known that I, WILLIAM C. WINFIELD, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Electrical Spot-Welding Machines, of which the following is a specification.

My invention is an improvement in electrical spot welding machines, and the improvement consists in a construction and arrangement of parts, substantially as herein shown and described and more particularly pointed out in the claims.

My improved machine is particularly constructed to make spot welds of small area, using opposed contact pins of small diameter and preferably of different diameters at their contact ends. These pins are removably and adjustably mounted upon or within suitable adjustable and replaceable supports to permit a wide range of operations upon varying kinds and sizes of work. To more conveniently facilitate handling of the product and simplify the control of the machine, the means for applying the pressure and the means for controlling the electric current are preferably rotatably mounted and jointly arranged to come under the control of a single hand of the operator who may thus stand at either side or the front of the machine in the most favorable position to expedite the work.

Other features of novelty are also embodied in other details of construction all as hereinafter more specifically described.

In the accompanying drawings, Figure 1 is a side view of my improved machine showing two overlapping plates in welding position, and Fig. 2 is a front view thereof. Fig. 3 is a plan view of the controlling handle and its rotatable and adjustable supporting parts. Fig. 4 is an enlarged sectional view of the front ends of both supporting arms for the contact pins and their clamping and operating parts. Fig. 5 is a cross section of the lower arm on line  $x-x$ , Fig. 4. Fig. 6 is a reduced view corresponding in part to Fig. 1 showing extension contact members adapted to substitute or supplement the usual contact pins, and Fig. 7 is a plan view of the lower arm and contact member shown in Fig. 6. Fig. 8 is a cross section of a modi-

fied form of lower arm, showing two inclosing channel bars for the middle copper bar.

Welding by my improved machine may proceed over or through plates or sheets of varying thicknesses, and the sizes of the plates or the shape of the same, whether flat, curved or irregular, demands a corresponding adaptability in the machine if the same is to be of general service. To this end, the machine comprises a suitable box like base or frame A having two laterally projecting arms, 2 and 3, respectively, which may be of any given length and shape, but preferably as shown with arm 2 webbed and cast and seated upon the top of base A and suitably insulated therefrom, and with arm 3 constructed of U shaped angle or channel iron riveted or bolted to a flanged casting 4 which in turn is bolted upon and insulated from the side of base A on a plane therewith at its top but in alinement with overhanging arm 2. The recessed portion of angle iron arm 3 is occupied by a copper bar or electric conductor 5 which extends from the extreme front to the rear where a suitable electrical connection 6 is made with a transformer 7 such as is usually supplied in this class of machines.

An arm 3 of angle iron gives all the necessary rigidity and strength needed to support the work and to resist the pressure upon contact pin 8 at its front end and which would be lacking if reliance were placed solely upon a copper conductor bar 5. A removable cap 9 bolted upon the end of arm 3 clamps pin 8 adjustably and fixed in place, and this cap may be substituted by another of different shape, say as seen in Fig. 7, wherein a side and forwardly projecting portion 10 is added or made an integral part of the cap proper to support a contact pin 8<sup>a</sup> for special service as will be explained later. Semi-circular vertical grooves in the end face of arm 3 and bar 5 and the meeting face of cap 9 provide a holding opening for lower copper contact pin 8, and which pin is axially alined with a second or upper contact pin or rod of copper 12 adjustably fastened by clamping cap 11 on slidable member 13 supported by overhanging arm 2. Although both pins 8 and 12 are shown as having the same diam-



eter they may be of different diameters to present contact ends of different areas. As shown however, a difference of areas is obtained by beveling or tapering the end of upper pin 12 to form a reduced flat end face 14 as compared with the full sized flat end face 15 of lower pin 8. Obviously this arrangement may be reversed, as the object is to prevent any appreciable or marked disfigurement of the surface during welding operations, the larger face —15— usually showing the least change or effect on the material being welded. This face is therefore generally applied to the polished sides of the plates and the smaller contact end to the unfinished or hidden surface.

Member 13 is tubular to hold pin 12 and its upper portion is in the form of a round stem which is slidably mounted in sleeve 16 having rotatable bearing in clamping head 17. That is to say, head 17 is slotted vertically at one side and a bolt or screw 18 is employed to contract it to clamp sleeve 16 against rotation if this be desired. Otherwise said sleeve may be rotated to set operating handle 19 at any given radial line with the contact pins as the axis of this movement and thereby permit the operator to stand at any point of advantage in manipulating the machine and in respect to the work.

Handle 19 is pivotally secured to ears 20 at the top of sleeve 16 and is used to raise and lower said member and its contact pin in respect to the work and to apply pressure thereto. An accommodating connection consisting of screws or pins 21 projecting through yoke 22 into annular groove 23 about the top of member 13, permits both a reciprocal movement of member 13 and a rotary movement of sleeve 16, said member 13 being prevented from turning but not from sliding by a vertical pin 24 confined within bore 25 in head 17, see Fig. 4.

A flexible electrical connection 26, one or more, is secured to the rear extension 27 of member 13 and leads to the transformer 7 in base A, and the object in using a flexible connection is to permit vertical reciprocal movements of the member 13 and lateral adjustments of head 17. As to this latter feature, it will be noted that head 17 has a ribbed rear face slidably mounted upon a grooved front face 28 of arm 2, and that bolts 29 pass through slots 30 in said arm to adjustably secure the said parts together. Such lateral adjustment is desirable to bring the respective upper and lower contact pins in axial alinement, or when clamps 9 and 11 are replaced by contact extensions 10 and 10<sup>a</sup> as shown in Fig. 6. The character of the work or the shape of the article to be welded may prevent a close approach to arms 2 or 3 or to the operating handle, or some other equally good reason may require sub-

stitution of one form of contact for another or a re-adjustment of the parts, and all this is anticipated by the construction shown and described.

Handle 19 has a rear extension provided with a weight 31 to counterbalance its longer front end and connected member 13, and an electric switch 32, preferably a knife switch is mounted upon the front portion of the handle and operatively controlled by a rotatable hand grip 33 sleeved over around stem 34 integral with the handle. Hand grip 33 is rotatably held to its place by a screw or pin 35 projecting into annular groove 36 in stem 34, and a gear 37 at its inner end meshes with a pinion 38 secured to the trunnions of the blade for switch 32. A slight rotary movement of the hand grip will either throw said blade into or out of contact with its coöperating contacts 39 in housing 40 and therethrough control the current passing to transformer 7 through electrical connection 41. This arrangement gives the operator full control of the pressure to be applied through handle 19 and at the same time complete control of the current, all with one and the same hand, thus leaving his other hand free to hold and guide the work. A set of tables 42, one at either side of arm 3, may also be used to support the work, and these tables are independently adjustable on vertical lines, each having a supporting standard 43 sleeved within a clamping bracket 44 bolted to base A.

A modified form of bar 3 is shown in Fig. 8, which consists of two channel irons oppositely arranged to provide a divided tubular bar 3 within which the copper conductor is completely inclosed to prevent undue loss of current and to give extra strength and rigidity to the bar as a whole.

What I claim is:

1. In an electrical welding machine, a pair of contact members, laterally adjustable means to slidably support one of said members for vertical movement and means adapted to be set on different radial lines relatively to the contact members to operate one of said members.

2. In an electrical welding machine, a pair of welding contacts and separate supports therefor having fastening devices to removably and adjustably secure said contacts in fixed position, operating means for one of said supports having a rotatable mounting, and means to fasten said mounting in various set positions.

3. In an electrical welding machine, a set of welding contacts and a support for each, one of said supports comprising a slidable member and a rotatable sleeve about the same and a supporting head for said sleeve, in combination with means to slidably operate said member.

4. In an electrical welding machine, a set



of welding contacts and a support for each, one of said supports comprising a vertically slidable member, a rotatable sleeve about said member, a laterally adjustable head for said sleeve, and a stationary arm for said head, in combination with means to operate said slidable member.

5. In an electrical welding machine, a set of welding contacts and a support for each, one of said supports comprising a slidable member, a rotatable sleeve about said member, and a fixed support for said sleeve, in combination with an operating device for said member mounted upon said sleeve and adapted to rotate therewith.

6. In an electrical welding machine, a set of welding contacts, and a support for each, one of said supports comprising a reciprocable member and a laterally adjustable head therefor, in combination with an operating device for said reciprocable member having a rotatable support mounted upon said head and laterally adjustable therewith.

7. In an electrical welding machine, a set of welding contacts and a support for each, one of said supports comprising a reciprocable member and a head, in combination with an operating lever for said reciprocable member having a support rotatably mounted upon said head and adapted to rotate about said member.

8. In an electrical welding machine, a set of welding contacts and a support for each, one of said supports comprising a reciprocable member and a rotatable sleeve and a head for the sleeve, in combination with an operating lever for said reciprocable member pivotally mounted upon said sleeve, and a counterweight for said lever.

9. In an electrical welding machine, a set of welding contacts and a support for each comprising a reciprocable member, a rotatable sleeve about said member, a head for said sleeve, and means to prevent said reciprocable member from turning, in combination with an operating device for said reciprocable member mounted upon said sleeve to rotate therewith.

10. In an electrical welding machine, a base and a set of laterally projecting arms thereon having welding contact devices at their outer ends, one of said arms comprising an angle iron beam and a copper bar secured lengthwise thereof.

11. In an electrical welding machine a base and a set of laterally projecting arms thereon having welding contact devices at their outer ends, one of said arms comprising a U shaped metallic bar and an electric conductor confined lengthwise therein.

12. In an electrical welding machine, a base and an overhanging arm thereon having a reciprocable member mounted therein, a contact pin removably secured at the bottom of said member, a flexible electric

conductor attached to said member, and means to reciprocally operate said member, in combination with a hollow arm having a conductor bar therein, and a contact pin removably mounted upon said arm opposite the contact pin in said reciprocable member.

13. In an electrical welding machine, a base, a set of laterally extending arms supported upon said base, and welding contact devices mounted at the outer ends of said arms, in combination with separate tables mounted at either side of said arms, and means to adjustably fix said tables independently at different elevations in respect to said contacts.

14. In an electrical welding machine, a base having an overhanging arm and a laterally projecting arm beneath the same and in alinement therewith, welding contact members adjustably fixed upon said arms, and means to raise and lower one of said contact members, in combination with a table at each side of the lower arm, and a supporting standard for each table having a clamping device to adjustably fix said tables independently on vertical lines.

15. A welding machine having opposed contact members to produce welds between overlapped plates, and a reciprocable support to bring one of said members into welding contact with the plate to be welded, said support having a vertically movable operating handle mounted to rotate in a fixed horizontal plane to permit the operator to stand in different positions to the work without change of vertical throw of said support and handle while welding any given piece of work.

16. In an electrical welding machine, a set of welding contact pins and supports for each, one of said supports being reciprocally mounted, in combination with electric current controlling means and a handle to support the same, said handle being vertically movable to operate said reciprocable support and horizontally movable on radial lines about said contact pins, and a handhold on said handle axially rotatable to operate said electric current controlling means in any and all of the vertical and horizontal positions of said handle.

17. In an electrical welding machine, a set of welding pins and supports for each, a pressure controlling member having a yoke connection encircling one of said pins and its support, an electric current controlling device mounted upon said member, and a hand grip to control both said pressure member and current controlling device.

18. In an electrical welding machine, a set of welding pins and oppositely alined supports for each, a pressure controlling handle having a rotatable yoke connection with one of said supports, and an electric switch for said pins mounted upon said handle and



movable therewith, and a rotatable hand grip mounted upon said handle and having a gear connection with said switch.

19. In a welding machine, a set of vertically alined contact pins for making welds in sheet metal plates, a slidable support through which one of said pins extends at both ends, a lever to reciprocate said support, a current controlling device mounted upon said lever, and a single hand-hold member to operate either said lever or current controlling device independently or jointly in any shifted position.

20. In a welding machine, a set of opposed welding pins, a reciprocable support having a vertical opening adapted to re-

ceive and hold one of said pins when inserted from above, a current controlling switch, a horizontally adjustable operating handle having a rotatable connection with said support, and a hand grip adapted to operate either said switch or said handle to permit the operator to control operations with one hand from any radial position about the machine.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM C. WINFIELD.

Witnesses:

E. M. FISHER,  
F. C. MUSSUN.