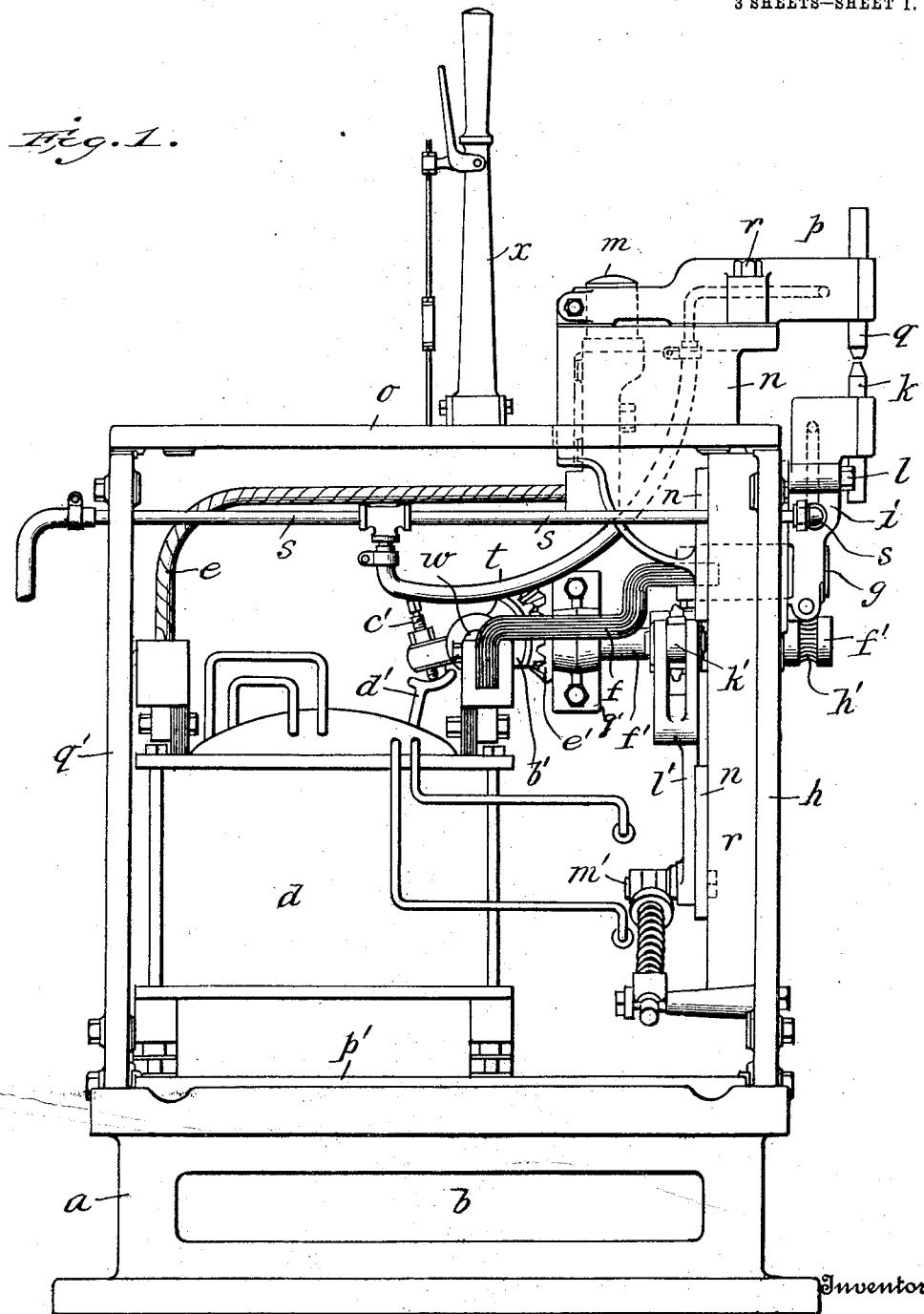


J. A. HEANY.
ELECTRIC WELDING MACHINE.
APPLICATION FILED JAN. 11, 1911.

1,015,492.

Patented Jan. 23, 1912.

3 SHEETS—SHEET 1.



Witnesses:

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John Allen Heany
By *Davis & Davis*

Attorneys

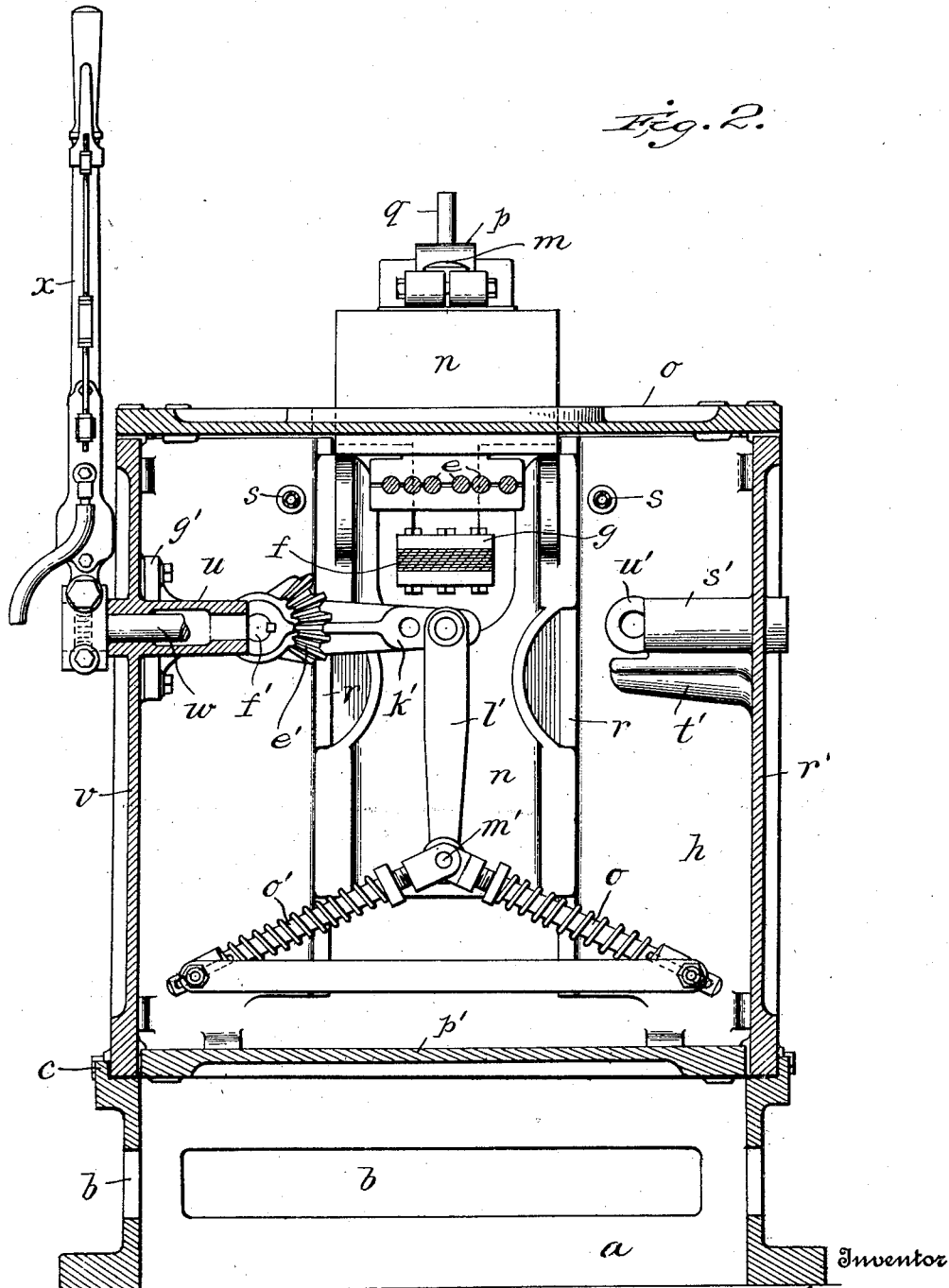
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Fig. 2.



Witnesses:

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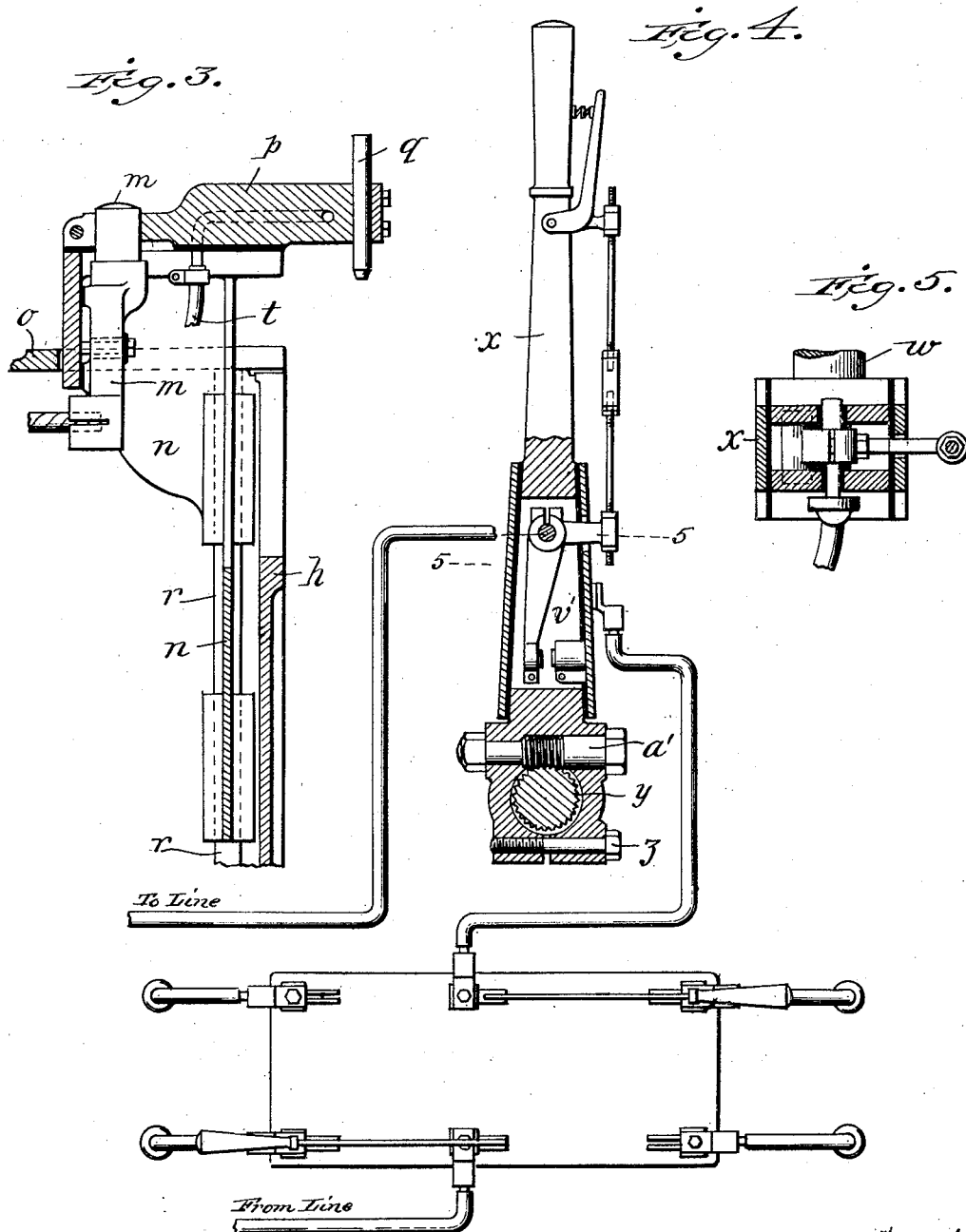
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UNITED STATES PATENT OFFICE.

JOHN ALLEN HEANY, OF FLINT, MICHIGAN.

ELECTRIC WELDING MACHINE.

1,015,492.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed January 11, 1911. Serial No. 602,047.

To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, and a resident of Flint, county of Genesee, State of Michigan, have invented certain new and useful Improvements in Electric Welding Machines, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, the near side wall of the casing being removed; Fig. 2 a vertical transverse sectional view; Fig. 3 a vertical sectional view, partly in section, showing the carriage for the movable electrode or horn; Fig. 4 a vertical sectional view partly in section, showing the construction of the operating lever; and Fig. 5 a detail horizontal sectional view taken through the operating lever.

The drawings show this invention adapted for spot welding but it will be obvious that my improvements may be applied to butt and lap welding as well. The object of this invention is to reduce the mechanism to the simplest and most efficient construction and to provide for a great variety of adjustments of the parts to the end that the welding points or electrodes as well as the operating lever may be brought to the most convenient position possible within the limits of the apparatus, so that any particular job or run of work may be performed with the least possible fatigue on the part of the operator or operators and with the least expenditure of time, as more fully hereinafter set forth.

In the drawing *a* designates a rectangular base preferably having an open top and openings *b* in the side walls and being also provided around its upper edge with an up-standing flange *c*. A casing or box is adapted to seat upon this base, within the flange *c*, this casing consisting of detachable walls, the several walls having approximately the same superficial area (that is, the box or casing being cubical in shape) in order that any one of the walls that happens to be used for the time being as the bottom may seat within the base.

Within the casing is suitably affixed a transformer *d* of the usual construction from

which lead the two conductors *e* and *f* which carry the work current to the electrodes. The conductor *f* is attached to the inner end of a terminal *g* extending outwardly through a slot in the front wall *h* of the casing, and clamped to the projecting end of this terminal *g* is a block *i* adapted to hold the stationary electrode *k*. This block *i* is split at its lower end to readily clamp detachably upon the terminal *g* and at its upper end it is provided with suitable means for detachably and adjustably holding the electrode or welding point *k*. Bolts *l* serve to clamp this electrode holder rigidly but detachably in place on the face of the box.

The conductor *e* is of a flexible type and is connected to the lower end of a terminal *m*, which terminal is bolted removably to a carriage *n*, which carriage works through a slot in the top wall *o* of the casing. The upper end of the terminal *m* projects above the upper face of the carriage, and upon this projecting end is clamped a block *p* carrying the upper movable electrode or welding point *q*, said block being removably bolted down to the upper face of the carriage by bolts *r*. This carriage *n* depends into the casing and is guided in its vertical movements by suitable guides *r* formed on or fastened to the front wall *h* of the casing. Suitable inlet and outlet pipes *s* extending through the top of the casing conduct cooling water to the stationary electrode-holder *i*, and flexible branches *t* of these pipes conduct cooling water to and from the movable electrode-holder *p*.

Journaled in a bearing *u* carried by one of the side walls *v* of the casing is a short horizontal shaft *w*, upon whose outer end is secured the operating lever *x*. This lever is attached to the shaft in such manner that it may be not only readily removed therefrom but may be rotatably adjusted on the shaft and rigidly affixed in its adjusted position; one convenient way of obtaining this adjustment is to provide the shaft with a worm gear *y*, clamp the split end of the lever over said gear by a bolt *z*, and employ a worm *a'* to engage the worm gear *y* and thus provide for rotatably adjusting the lever on the shaft

and at the same time for locking the lever in its adjusted position.

The inner end of the shaft *w* is provided with a bevel gear *b'* and also with adjustable stop *c'* adapted to contact with stationary lug *d'* on the side wall *p*, to limit the rotation of the shaft *w* in one direction. A gear *b'* meshes with a bevel gear *e'* rigidly affixed to the inner end of a shaft *f'* whose inner end is journaled in a bearing *g'* rigidly attached to the side wall *v*. The outer end of the shaft *f'* extends through the front wall *h* and is provided with a worm *k'* similar to the worm gear on the shaft *w*, to adapt this shaft for the reception of the lever *x*.

Attached to the shaft *f'* is a horizontal arm *k'*, and pivotally depending from the free end of this arm is a pitman or link *l'* whose lower end is pivotally connected to a horizontal pin or bolt *m'* projecting horizontally inward from the carriage *n*. A suitable counter-balancing device is employed to normally force the carriage *n* and its connected parts upwardly to the limit of its upward stroke, which stroke is determined by the adjustable stop *c'*. Any suitable counter-balancing device may be employed for this purpose, but I prefer employing means consisting of a pair of spring actuated toggle bars *o'* pivotally connected to the pin *m'* and slidingly connected to a pair of pins mounted stationarily on the front wall of the casing in a plane below the plane in which the said pin *m'* is adapted to work.

It will be observed that the electrodes or welding points are normally separated, and that to bring them together upon the work it is simply necessary to rotate the shaft *w* by means of the lever *x*, which action rotates shaft *f'* and through the medium of the arm *k'* and link *l'* forces the carriage downwardly against the action of its counter-balance. The flexible conductor *e* and the flexible water pipes *i* permit a free movement of the carriage. The means for rendering the electrode blocks or carriers removable is important in that it is highly desirable in shop practice to have these blocks or horns readily interchangeable with horns or blocks of other shapes and sizes. By making the operating lever removable from the shaft *w* and so constructing and

arranging the parts that the lever may be readily attached to the shaft *f'*, enables the lever to be positioned on the front wall of the box where it will be more convenient for the operator on certain pieces of work.

A very important feature of the invention lies in so constructing the casing or box that several of its walls in addition to the bottom wall *p'* may be used for the time

being as the bottom, by lifting the casing off the base and rotating it to bring one of the other walls to the under side. For instance, the casing may be lifted off the base and rotated backwardly to cause its back wall *q'* to seat within the base, thus bringing the electrodes into a horizontal position and to what is for the time being the rear part of the apparatus. Again, it will be observed that the casing may be turned over side-wise in either direction to bring either one of its side walls into position to serve for the time being as the bottom, it being obvious that should it be desirable to bring the side wall *v* to the under side it will be necessary to remove the lever from the shaft *w* and apply it to the shaft *f'* or to operate the carriage in some other suitable manner. In this way the apparatus may be adjusted about to bring the electrodes or welding points to the most convenient position possible within the range of the apparatus for any particular piece or run of work. These adjustments of the lever and the casing however are not intended to be made from time to time during the day or while working on a single piece of work but are intended only to be made at considerable intervals to adapt the machine for operation upon a large number of pieces of work of the same kind or type. As these machines are used for welding a great variety of articles having a great variety of shapes and sizes, it will be obvious that this wide range of adjustability is of great advantage.

To give the apparatus a still further range of adjustability for convenience in operation, I so construct the carriage operating mechanism that it may be removed entirely from one side of the casing and mounted upon the opposite side of the electrodes. To permit this to be done I provide the side wall *r'*, opposite the wall *v* with a bearing *s'* which is a duplicate of the bearing *u*, a lug *t'* which is a duplicate of the lug *d'*, and I provide the front wall *h* with a duplicate bearing *u'* for the front end of the shaft *f'*. Thus it will be observed that all the operating parts may be shifted over to the opposite side of the apparatus whenever in running through a particular piece of work it is more convenient to have the operating mechanism on that side of the box.

The wiring may be arranged in any suitable manner and I do not deem it necessary to describe the same in detail. I prefer mounting upon the operating lever a circuit closer *v'* and adapting the same to be actuated by the finger of the operator without removing his hand from the handle in any suitable manner, whereby the circuit may be readily closed after the welding points are

brought together on the work and may be readily opened before the welding points are separated to thus prevent arcing.

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

1. In an electric welding machine, the combination of a base having a casing seat, and a casing supporting the welding electrodes and mechanism for manipulating the same, said casing having a plurality of external seat-faces angularly disposed with reference to each other, each one of these seat-faces being adapted to be seated upon the base.

2. The combination with a base having a casing seat, and a casing of cubical conformation two or more sides of which are adapted to seat upon the base separately, said casing carrying electric welding means.

3. The combination with a base having a casing seat, and a casing of cubical conformation two or more sides of which are adapted to seat upon the base separately, said casing carrying electric welding means, the welding points or electrodes being carried at one corner of the casing external thereto.

4. In an electric welding machine, the combination of a casing, a transformer therein, a reciprocating carriage working through an opening in the top of the casing, a terminal *m* extending up through said carriage and insulated therefrom, a terminal *g* extending out through one of the vertical walls of the casing, these two terminals being electrically connected to the transformer, an electrode-carrier fastened on top of the carriage and clamped removably to the upper end of the terminal *m*, and another electrode-carrier fastened to one of the vertical walls of the casing and clamped to the stationary terminal extending therethrough.

5. In combination with an electric welding machine embodying a casing and an inclosed transformer, a stationary terminal connected to the transformer and extending through one of the walls of the casing, an electrode-carrier clamped removably to said terminal and removably fastened to the adjacent wall of the casing, a reciprocating carriage working through an opening in one of the other walls of the casing, means for moving this carriage, a terminal connected to the transformer and mounted on and extending through said carriage and insulated therefrom, and another electrode-carrier removably connected to said terminal and removably fastened to the carriage.

6. In an electric welding machine, the combination of a casing, a stationary electrode-carrier, a carriage carrying another electrode-carrier, means for actuating said

carriage embodying a rock shaft extending through one wall of the casing and devices connecting the same inside the casing with the carriage, the outer end of said rock shaft being adapted to receive an operating lever, a supplemental shaft extending through another wall of the casing and means connecting its inner end with the aforesaid rock shaft, and an operating lever adapted for connection to either the supplemental shaft or the rock shaft.

7. In an electric welding machine, embodying a casing, and a carriage carrying one of the electrodes, means for reciprocating said carriage embodying a shaft extending into the casing through one of the walls thereof and devices connecting the same to the carriage, and a supplemental operating shaft extending into the casing through one of the other walls thereof and lying at right angles to the aforesaid shaft, gearing connecting the inner ends of the two shafts, and an operating lever adapted for connection to the projecting end of either of said shafts.

8. In an electric welding machine, embodying a casing and a shifting carriage carrying one of the electrodes, means for operating said carriage embodying a shaft extending into the casing through one of the walls thereof, said shaft having its journal-bearing in said wall at one side of the carriage, means connecting the inner end of the shaft to the carriage embodying an arm attached to the shaft and a link connecting the arm to the carriage, an operating lever adapted for attachment to the outer end of said shaft, and a supplemental journal-bearing in the casing at the opposite side of the carriage, whereby the operating shaft may be shifted to the opposite side of the carriage and the operating arm on the shaft be reversed.

9. In an electric welding machine embodying a casing and a shifting carriage carrying one of the electrodes, said carriage being slidably mounted on the inner face of one of the walls of the casing and projecting out through an opening in one of the other walls of the casing, means for reciprocating said carriage consisting of a rock shaft removably journaled in an opening in the casing wall at one side of the carriage, means connecting the inner end of said shaft detachably to the carriage, and a supplemental journal-bearing in the wall of the casing at the opposite side of the carriage, and an operating lever adapted for detachable connection with the outer end of said shaft.

10. In an electric welding machine embodying a casing and a carriage carrying one of the electrodes and working through one of the walls of the casing, and means for

reciprocating said carriage embodying a
rock shaft extending into the casing through
one of the walls thereof and journaled in a
bearing on said wall, a lever adapted for
5 detachable connection to the outer end of
said shaft and said shaft being removable
from its bearing, a supplemental bearing for
said shaft in the opposite wall of the casing,
and means connecting the inner end of said
10 shaft with the carriage whereby the rocking
of the shaft will reciprocate the carriage,

this latter means being reversible so that the
carriage may be operated through the me-
dium of said shaft from either side of the
machine.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses
this 9th day of January, 1911.

JOHN ALLEN HEANY.

Witnesses:

BERNARD C. BECKER,
N. CURTIS LAMMOND.