

(No Model.)

3 Sheets—Sheet 1.

C. L. COFFIN.
APPARATUS FOR ELECTRIC WELDING.

No. 495,393.

Patented Apr. 11, 1893.

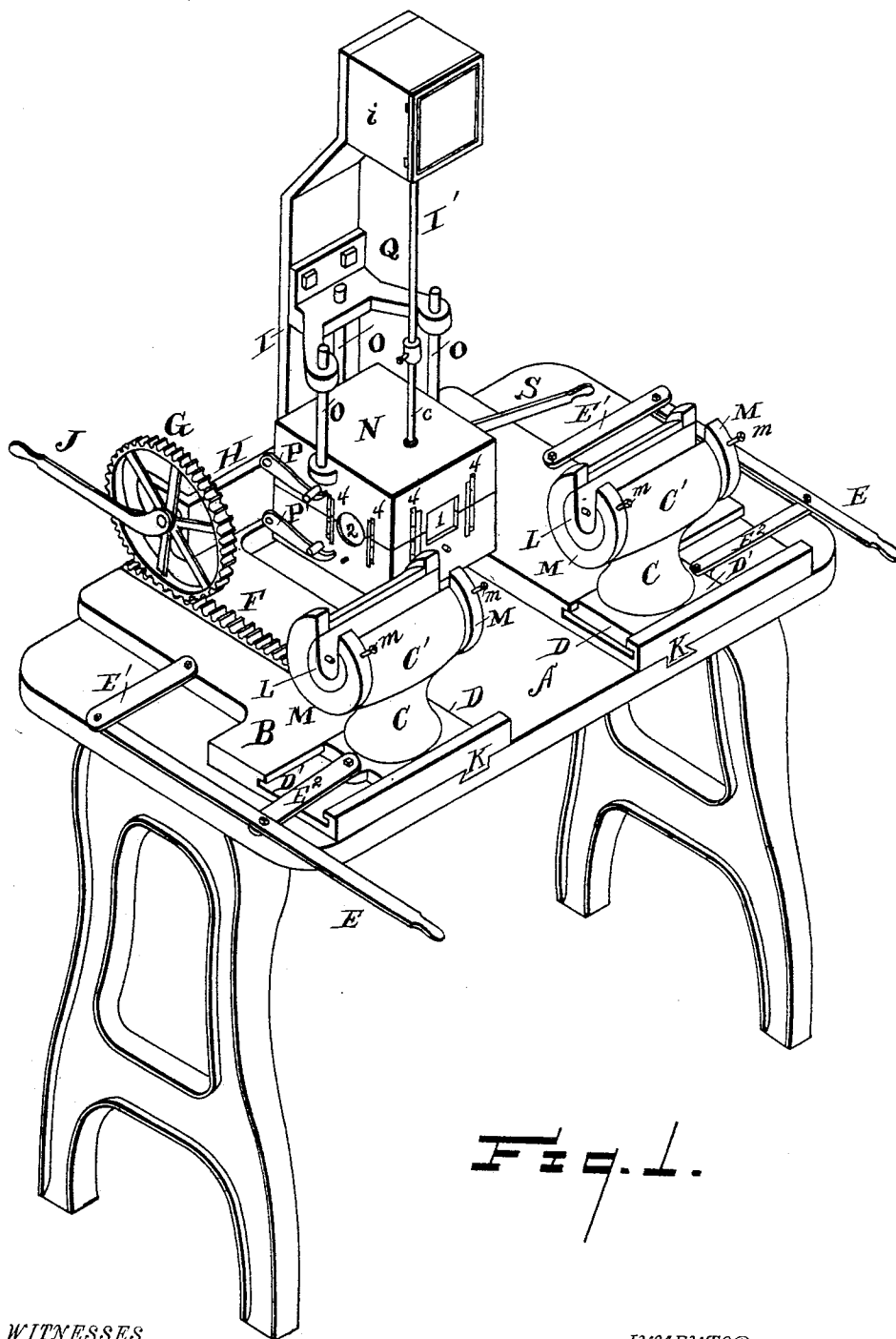


Fig. 1.

WITNESSES

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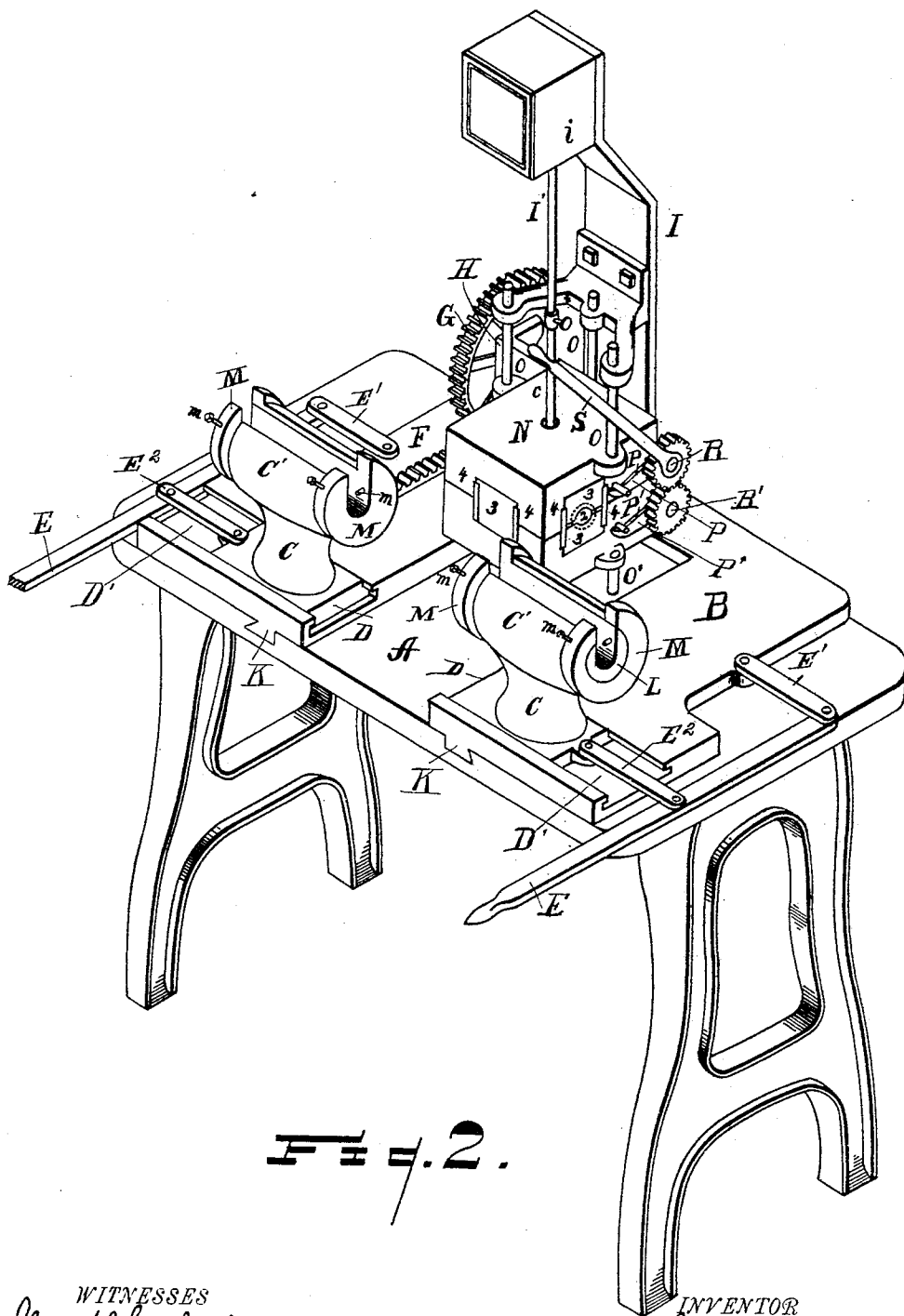


Fig. 2.

WITNESSES

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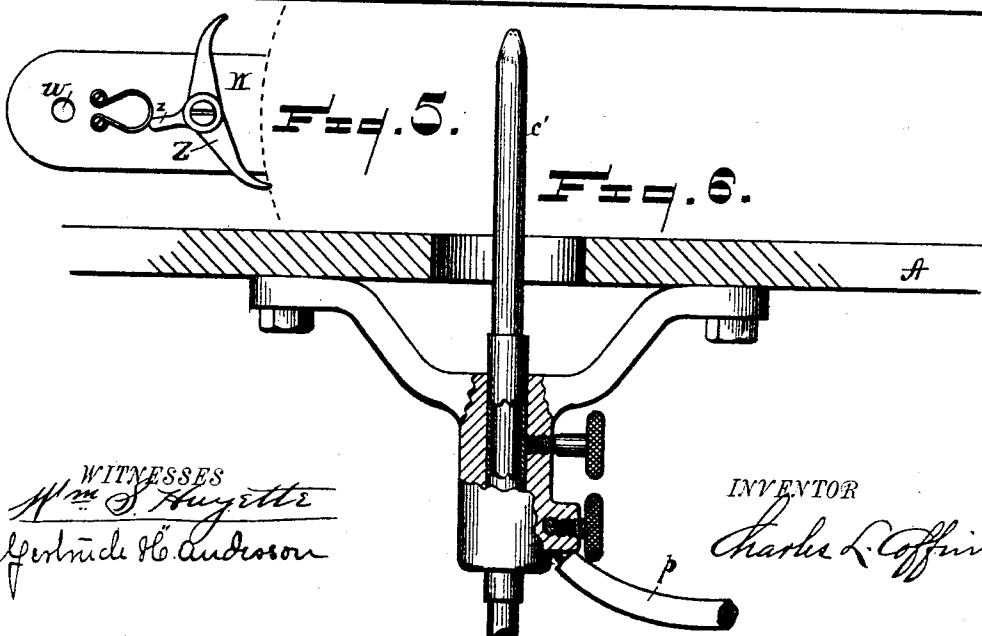
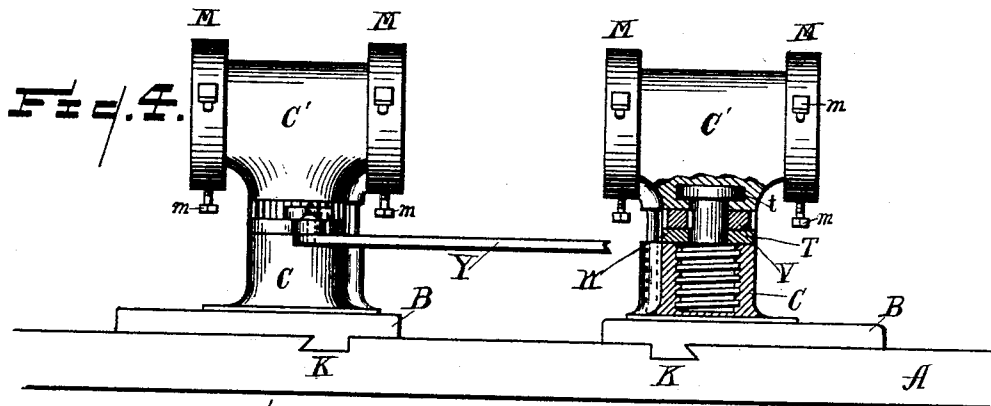
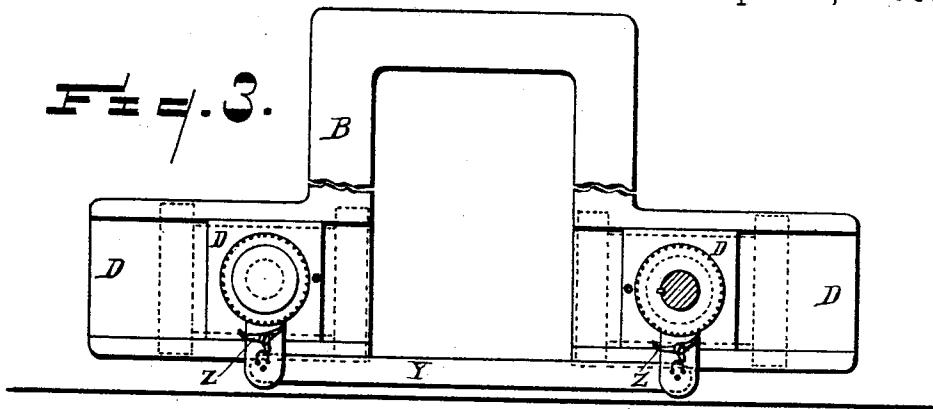
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WITNESSES
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CHARLES L. COFFIN, OF DETROIT, MICHIGAN.

APPARATUS FOR ELECTRIC WELDING.

SPECIFICATION forming part of Letters Patent No. 495,393, dated April 11, 1893.

Application filed June 11, 1891. Serial No. 395,906. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. COFFIN, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Apparatus for Electric Welding, of which the following is a specification.

My invention consists in an improvement in apparatus for electric welding, hereinafter fully described and claimed.

Figures 1 and 2 are perspectives from opposite ends of the complete machine. Fig. 3 is a plan of a hoop with the clamp supports in section. Fig. 4 is a front elevation of the clamps and clamp supports, partly in section. Fig. 5 is a detail of one of the pawls, and Fig. 6 is an elevation of the lower carbon partly in section.

A represents a table of suitable size and of any desired material.

B represents a clamp, approximately U-shaped, provided with dove-tails K, by which it is secured to table A, and capable of sliding backward and forward thereon.

C C represent two posts each standing on a plate D, which is dove-tailed and slides in dove tail grooves D' in the ends of yoke B, the motion of plates D being at right angles with the motion of yoke B.

C' C' represent movable slotted cylinders carried on posts C, C, and vertically movable in said posts by the screw mechanism shown in Fig. 4, which will be hereinafter described.

L L represent a slotted cylinder lying in the cylinder C' C' and adapted to rotate therein, and these cylinders L are intended to hold the work which is to be operated upon, this being omitted in the drawings to show the lines more clearly.

M M represent collars secured on the ends of cylinders L L, provided with screw bolts m, by which a bar of metal placed in cylinder L may be securely clamped therein.

E E represent levers each of which is fulcrumed to yoke B by a link E', and this is also connected with one of the sliding plates D by a link E², and by means of these two levers the clamp C' may be moved toward or away from each other.

F represents a rack-bar on yoke B.

G represents a gear-wheel carried on a shaft which is journaled in a bracket H at the back of table A, and meshes in the rack-bar F.

J represents a lever by which gear-wheel G can be turned, thus moving the yoke B on table A.

N represents a furnace, in the form of a double box, the lower part of which is carried on fingers P' at each end thereof as shown in Figs. 1 and 2, while the upper part is carried on fingers P, Figs. 1 and 2, these fingers being severally secured upon shafts R and R' which are journaled in bracket H, and which are connected by the intermeshing gear wheels r r, so that the weight of the box keeps it normally closed.

S represents a hand lever secured to one end of these gear-wheels r, by turning which the box or furnace N may be opened.

O O represent guide rods running through eyes in a bracket Q on the support I, to guide the upper part of box or furnace N as it rises or falls.

1 represents an opening through the front of the box or furnace N, and 2, 2, represent opposite openings at the sides thereof to admit the introduction of a rod or rods of metal which are to be heated within the furnace.

4, 4 represent guides at the sides of each of these openings, and 3, 3 represent shutters sliding in said guides and supported upon pins. These shutters are preferably made in halves, but may be single if preferred.

i represents a box containing regulating mechanism, which for the purposes of this application may be of any known regulating mechanism for the purpose of making an electric arc light.

I' represents a carbon holder projecting downward from the box i, and c represents the upper carbon carried in said carbon holder and projecting through a hole in the top of box or furnace N into said furnace. The lower carbon c' is shown in Fig. 6 attached to a stationary holder below table A, provided with adjusting screws, and projecting upward into the interior of the furnace N opposite the upper carbon c. The lower carbon may be made hollow, as shown in the drawings, but con-

nected with a pipe *p* through which may be forced a blast of air or gas to intensify the arc if desired.

In operating upon articles of unequal size or irregular shape, or for purposes of making a lap-weld, it is often desirable to have one of the clamps higher or lower than the other.

Turning to Fig. 4, *T* represents a bolt screw-threaded to engage with a screw-thread formed in post *C*, and having a shoulder head *t* engaging with the slotted cylinder *C'*, whereby the rotation of said screw bolt raises or lowers said cylinder.

V represents a gear wheel connected with posts *C*, by a slot and feather *v*, and *W* represents a collar which turns loosely on the top of post *C*. The collar *W* has a projecting lug *w*, and carries a spring pawl *Z*, Fig. 5, so that it may be made to act upon gear wheel *B*, in either direction, moving the tail of pawl *z* to one side or the other of the actuating spring.

Y represents a bar pivoted to lug *w*, by which both pawls may be actuated at once if desired.

The operation of my invention is as follows: If two bars of iron are to be welded, they are severally inserted within the slotted cylinders *L* and clamped by the bolts *m*. They are then passed within the box or furnace *N*, and this may be done in one or two ways; either the clamps *c'* may be drawn apart by the lever *E*, until the ends of the rod will pass by the sides of the furnace *N*, when the yoke *B* is retracted by means of lever *J*, wheel *G* and rack-bar *F* until the rods stand opposite the openings 2, 2 in the sides of the furnace, when the clamps are brought toward each other by the levers *E*, then inserting the rods through the openings 2, 2: or by raising the end of lever *S*, the two halves of the box or furnace *N* are opened, the upper one rising and the lower one falling, when by rotating the yoke *B* the rods are brought in a right position, and by lowering lever *S* the furnace is closed around it. The shutters 3 are preferably made in halves so that each moves with its half of the box, though they may be made in single pieces and that for the front part 1, I prefer to make of mica, and colored glass, preferably a deep wine. The work being in position, a current is passed through the carbon *C'* from any suitable source of electricity and an arc is formed within the furnace *N* and in close proximity to the ends of the rod. While subjected to the arc the rods may be revolved, the slotted cylinder *L* turning freely in the slotted cylinder *C'*, and this may be done either by rotating the collars *M* by hand or by turning the rods themselves. If it is desired to intensify the heat of the arc, a blast of air or gas may be driven through the pipe *p* and through the lower carbon. When the rods have been raised to a welding heat, they may be forced together by the lever *E*, and may be

still revolved slowly while being so pressed, together, but as they lie in front of the arc of carbon *c'* as clearly shown in Fig. 2, the carbons do not interfere with this operation. If it is desired to make a lap-weld between two bars, either one of the clamps *C'* may be raised high enough to permit the surfaces of the bars to come together. When the heating and pressing together has been sufficiently progressed, the box or furnace *N* is opened, and the work withdrawn. It is of course to be understood that the box or furnace *N* is lined with suitable refractory material. By moving the clamps *C'* *C'* by means of levers *E*, the rods can be moved to and fro before the arc, and this can be done either while the rods are being rotated, or while they are not rotating, as preferred. This motion extends the heating influence of the arc along the rods, and aids in the operation of welding or working. The lower half of furnace *N* is guided by pins *O'* in the same manner as the upper half of said furnace.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for electrically heating metal the combination of a pair of movable and rotating clamps, a furnace, between them, means for opening and closing said furnace, and mechanism for maintaining an electric arc within said furnace, substantially as shown and described.

2. In a machine for electrically working metal a support, a yoke movably mounted on said support, two rotatable clamps movably mounted on said yoke, a furnace and means for maintaining an electric arc within said furnace, substantially as shown and described.

3. In a machine for electrically heating metal, a movable support, a movable clamp mounted on said support, a furnace, and means for maintaining an electric arc in said furnace, substantially as shown and described.

4. In a machine for electrically welding metal a table, a yoke mounted movably on said table, a separable furnace lying in the opening of said yoke, two posts mounted in the ends of said yoke and movable therein across the path of motion of said yoke, and a clamp adjustably mounted on each post, substantially as shown and described.

5. In a machine for electrically welding metal a separable furnace consisting of a two part box, two rock shafts, each supporting one part of the furnace, and intermeshing gear-wheels on said rock-shafts for opening and closing said furnace, substantially as shown and described.

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Witnesses:

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