

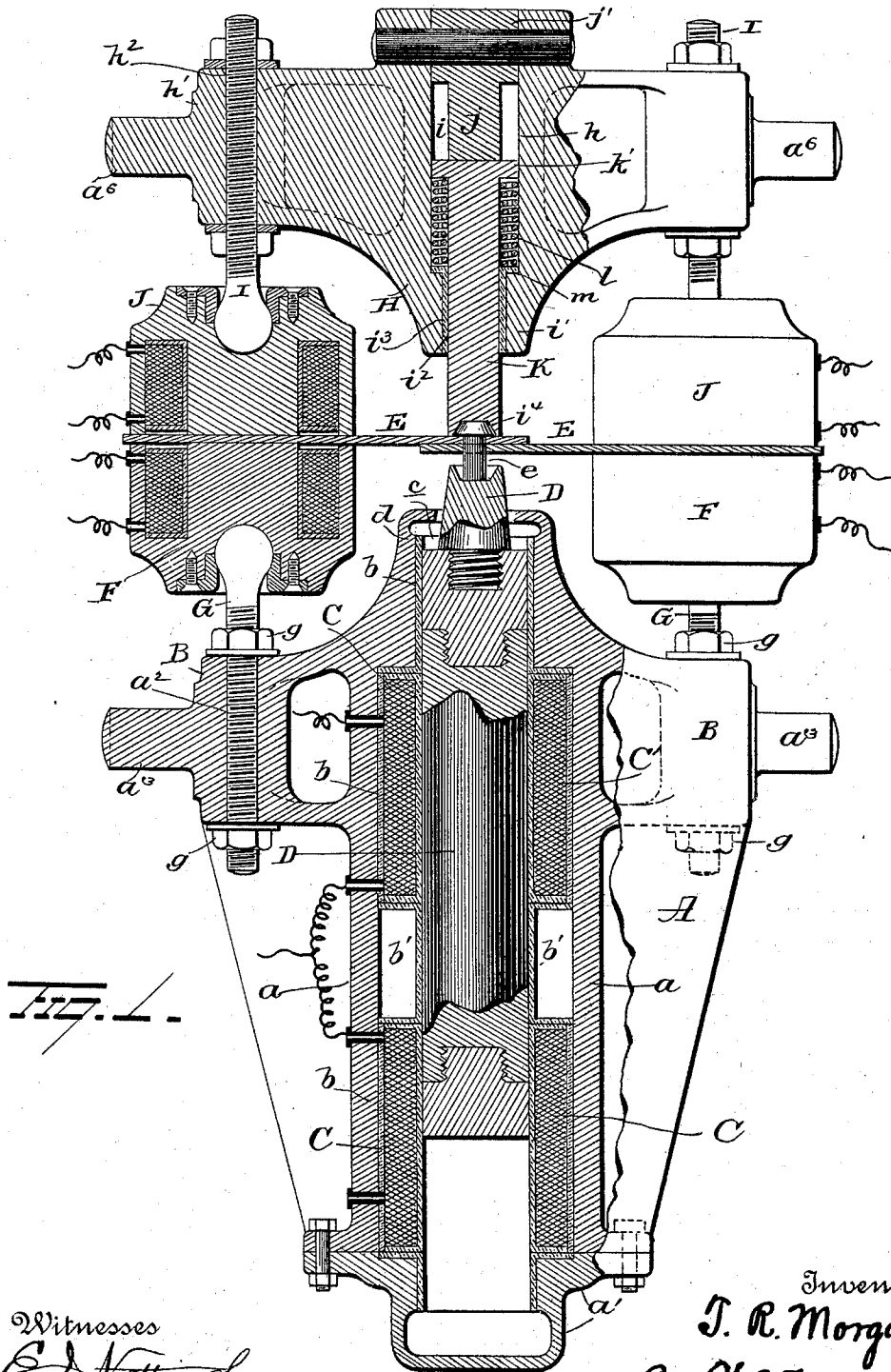
(No Model.)

2 Sheets—Sheet 1.

T. R. MORGAN, Sr.
RIVETER.

No. 586,197.

Patented July 13, 1897.



Witnesses
E. J. Nottingham
G. J. Downing

Inventor
T. R. Morgan Sr.
By H. A. Seymour
Attorney

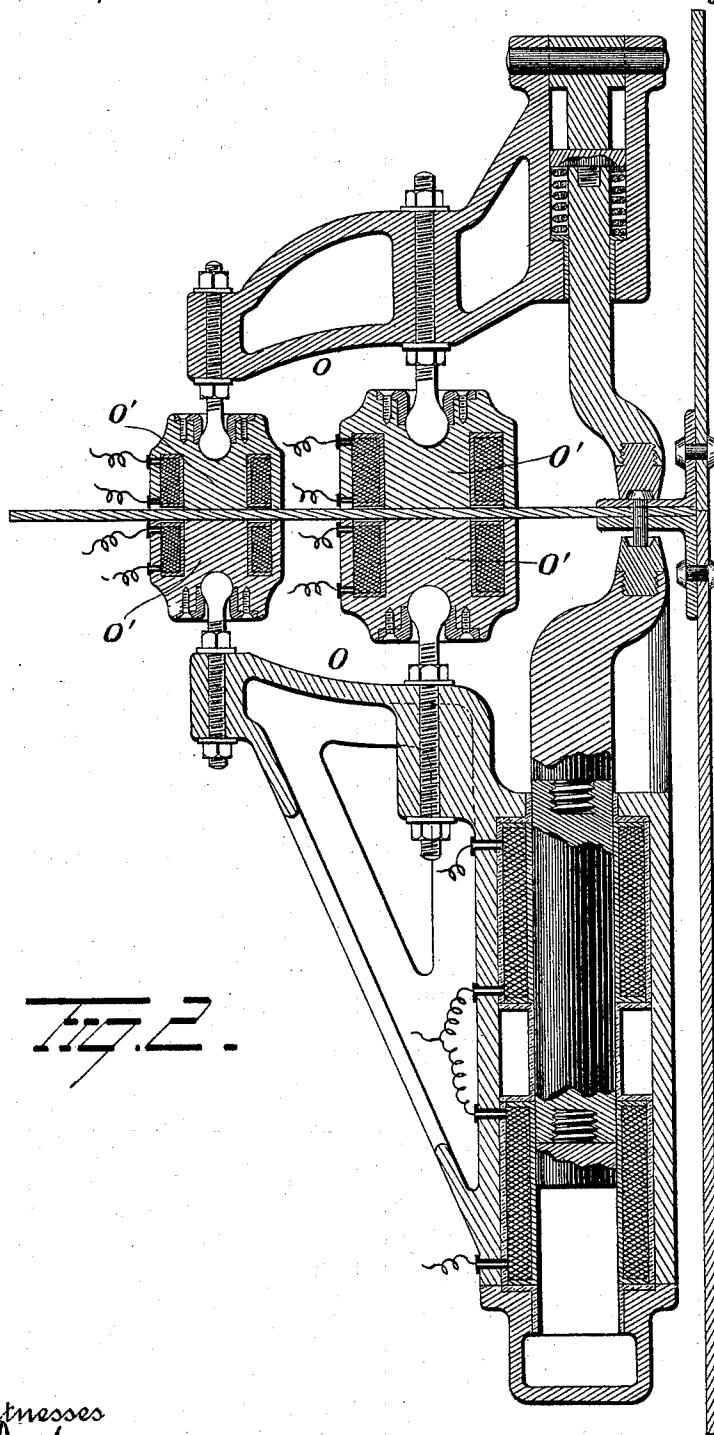
(No Model.)

2 Sheets—Sheet 2.

T. R. MORGAN, Sr.
RIVETER.

No. 586,197.

Patented July 13, 1897.



Witnesses
E. J. Nottingham
G. F. Downing

Inventor
T. R. Morgan Sr.

By H. A. Seymour
Attorney

UNITED STATES PATENT OFFICE.

THOMAS R. MORGAN, SR., OF ALLIANCE, OHIO, ASSIGNOR OF THREE-FOURTHS
TO THOMAS R. MORGAN, JR., JOHN R. MORGAN, AND WILLIAM H. MORGAN,
OF SAME PLACE.

RIVETER.

SPECIFICATION forming part of Letters Patent No. 586,197, dated July 13, 1897.

Application filed September 5, 1894. Serial No. 522,207. (No model.)

To all whom it may concern:

Be it known that I, THOMAS R. MORGAN, Sr., of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Riveters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in riveters; and it consists, broadly, in a reciprocating electric motor carrying a riveting-die and electromagnetic devices constructed and adapted to hold the motor in fixed position relative to the work.

My invention further consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of one form of apparatus embodying my invention. Fig. 2 is a sectional view of a riveter designed particularly for riveting in close places, where the form shown in Fig. 1 could not be used.

In the construction disclosed in Fig. 1, which is designed more particularly for riveting the overlapping edges of plates, A represents a frame comprising a central hollow body portion *a*, closed at one end by a removable cap *a'*, and lateral arms B, having screw-threaded perforations *a*² and trunnions *a*³, by which same is supported. Within the hollow body *a* a casing *b*, preferably of non-magnetic material, is located, said casing being contracted at a point between its ends, as at *b'*. The casing *b* is also contracted to produce a lining for an opening *c* in the projecting end *d* of the frame. Within the casing *b* two helices C C' are located and separated by the contracted portion *b'* of said casing.

The helices C C' are provided with a common iron core D, thus producing two solenoids with a common core, said core normally projecting through one helix and into the other. The helices C C' are included in independent electric circuits with a suitable generator, and suitable switch mechanism will be provided whereby to close the circuit through said helices alternately. The helices are so wound that when one is energized the core will move in one direction and when the

other is energized said core will move in the reverse direction.

To one end of the core D a tool D' is secured and projects up through the end of the opening *c*. In the drawings the tool represented is a die adapted to upset the end of a rivet *e* passing through the overlapping ends of two steel or iron plates E E.

In order to properly support the frame, so that the accurate alinement of the tool with the work will be insured, I provide two (more or less) electromagnets F F', included in circuit with a suitable generator and adapted to become rigidly attached to the object under treatment by magnetic attraction.

Each magnet F is adjustably supported by a ball-and-socket connection with a screw G, which passes through the screw-threaded perforation *a*² in one of the lateral arms B, and said screws are prevented from accidental displacement by means of nuts *g* and washers.

Adapted to act in connection with the parts above described is a frame H, comprising a hollow central or body portion *h* and lateral arms *h'* *h'*, having screw-threaded perforations *h*², through which screws I I pass, and trunnion *a*⁶, to which the suspending devices are secured. To one end of each of these screws an electromagnet J is connected by a ball-and-socket joint, and said electromagnets are energized by an electric current from any convenient source of electric generation. The electromagnets are made to attract the plates E E, and the frame H is thus retained properly in position, as shown in Fig. 1.

Within the chamber *i* of the hollow body portion *h* of frame H a movable plunger K is located and provided with a head K', adapted to neatly fit and freely move in said chamber. The frame H is provided with a conical inwardly-projecting portion *i'*, having an opening or passage *i*², communicating with the larger opening or chamber *i* in said frame.

The opening or passage *i*² is preferably provided with a lining *i*³, through which the plunger passes. The plunger K projects some distance beyond the frame H and at its free end is made with a die *i*⁴ to receive the head of the rivet, thus constituting it a holding-die. This holding-die is retained in

proper engagement with the head of a rivet by means of a cam *j*, carried by a lever *j'*, said cam being adapted to enter the chamber *i* and bear against the head *K'* of the plunger *K*.

5 To move the holding-die to the position shown in Fig. 1 the cam *j* will be operated by means of a suitable handle secured to the cam. A spring *l* is coiled about the plunger *K* within the chamber *i* and bears at its res-
10 pective ends against the head *K'* and a shoulder *m* at one end of said chamber *i*, the purpose of this spring being to move the holding-die away from the head of the rivet when the opposite end of the latter shall
15 have been upset, as presently explained, and the cam shall have been moved out of engagement with the head *K'* of the plunger.

The rivet having been passed through aligned perforations in the overlapping edges
20 of the plates *E E*, the frame *H* will be placed in position as above described, so as to cause the head of the rivet to enter the recess of the holding-die. The tool-holding devices will then be placed in position on the oppo-
25 site sides of the plates *E E*, so that the tool *D'* will be in exact alinement with the rivet.

An electric current will now be made to pass through the helix *C* in such direction as to cause the core *D* to be drawn into said
30 helix, thus withdrawing the tool *D'* from the end of the rivet. When the core shall have moved to the extent of its rearward stroke, the switch above alluded to will operate automatically to open the circuit through the
35 helix *C* and cause it to flow through the helix *C'*. The helix *C* being thus deenergized and the helix *C'* energized, the core *D* will be drawn into the latter and made to make its forward stroke and cause the tool *D'* to come
40 forcibly into contact with the rivet to upset the end thereof. When this action shall have taken place, the current will be again shifted from the helix *C'* to the helix *C* and the rearward stroke of the core again accom-
45 plished.

The reciprocation of the core will continue automatically as long as the current is passed alternately through the helices, and the cur-
50 rent will be supplied to the helices until the rivet shall have been upset to the proper extent.

In the construction disclosed in Fig. 2, which is designed for close quarters, such as riveting the ends and sides of plates to an-
55 gle-irons, I employ the frames *O*, which are in the form of brackets, and provide each with two electromagnets *O'*, the latter being constructed and secured to the frames, as in Fig. 1. Both magnets are located to one side
60 of the tools, which, as shown, are so located that they can work in a corner or well up to

the ceiling or down to the floor, as necessity demands. In this construction the holding-die and riveting-die are constructed and operated in the manner described in connection
65 with Fig. 1.

It is evident that numerous slight changes might be resorted to in the relative arrangement of parts herein shown and described without departing from the spirit and scope
70 of my invention. Hence I would have it understood that I do not wish to restrict myself to the exact construction of parts herein shown and described; but,

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

1. The combination with a frame, a tool-holder carried by said frame, and means for moving said tool-holder, of screws adjust-
80 ably secured to said frame, and electromagnets connected to the screws by universal joints.

2. The combination with a frame, a tool-holder carried thereby and devices constructed and adapted to reciprocate said tool-holder,
85 of screws adjustably secured to said frame, and electromagnetic devices for retaining the frame in fixed relation to the work connected to the screws by universal joints.

3. The combination with two frames, one frame carrying a tool-holder and devices for moving said tool-holder, and the other frame carrying a holding-up tool, of screws adjust-
90 ably secured to said frames, and electromagnetic devices for retaining said frames in fixed relation to the work, connected to the screws by universal joints.

4. In a riveter, the combination with two frames, one carrying a reciprocating elec-
95 tromotor having a riveting-tool, and the other frame carrying a holding-up tool, of screws adjustably secured to said frames, and electromagnetic devices for retaining said frames in fixed relation to the work, connected to
105 the screws by universal joints.

5. The combination with two frames, a reciprocating electric motor mounted in one frame and carrying a riveting-tool, and a
110 holding-up die carried by the other frame, of screws adjustably secured to each frame, and an electromagnet for each screw, each magnet being connected to its screw by a uni-
versal joint.

In testimony whereof I have signed this
115 specification in the presence of two subscribing witnesses.

THOMAS R. MORGAN, Sr.

Witnesses:

W. H. RAMSEY,
A. C. STRONG.