G. A. GRAY, Jr.

MACHINES FOR MAKING RIVETS, &c.

No. 181,782. Patented Sept. 5, 1876.

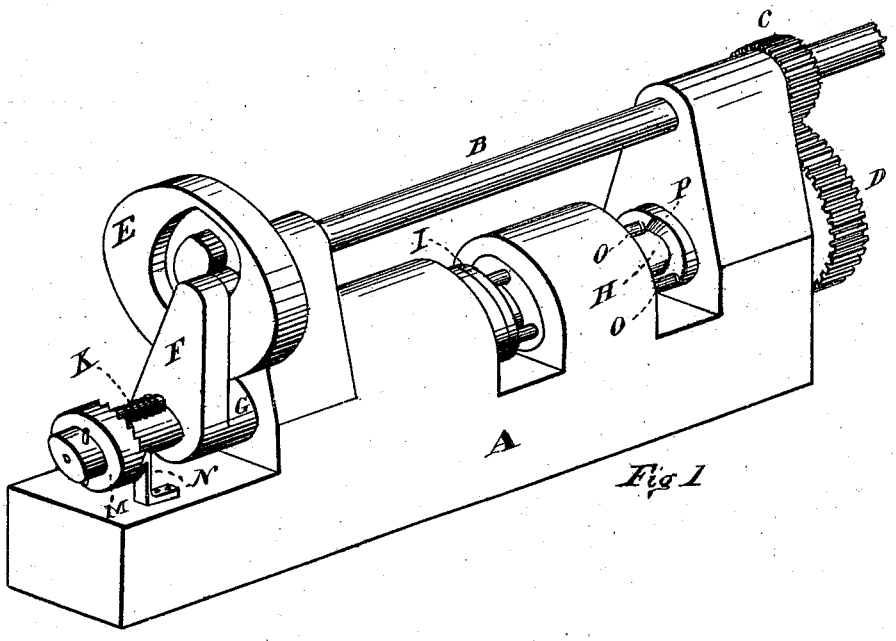

Fig 1

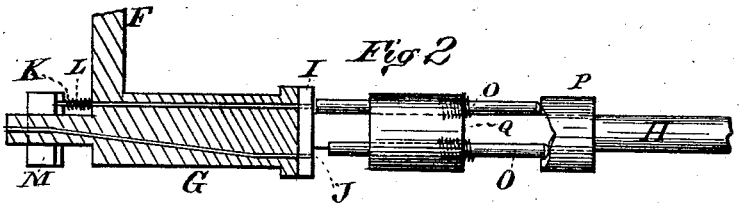

Fig 2

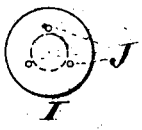

Fig 3

Witnesses;

John M. Davidson

Jas W. See.

Inventor;

George A. Gray Jr.

UNITED STATES PATENT OFFICE.

GEORGE A. GRAY, JR., OF HAMILTON, OHIO.

IMPROVEMENT IN MACHINES FOR MAKING RIVETS, &c.

Specification forming part of Letters Patent No. **181,782**, dated September 5, 1876; application filed January 22, 1876.

To all whom it may concern:

Be it known that I, GEORGE A. GRAY, Jr., of Hamilton, Butler county, Ohio, have invented a Machine for Making Rivets, &c., of which the following is a specification:

The object of this machine is to make from the wire rivets, screw-blanks, &c. The main objects attained in this machine are simplicity and efficiency. The machine will be described, and then its operation.

In Figure 1, A is the frame of the machine, supporting bearings for the moving parts. B is the shaft to which motion is applied. On one end of this shaft is fastened the pinion C, gearing into the pinion D. The relative sizes of C and D are governed by circumstances, which will presently be described. On the end of the shaft B is fastened the cam E, which is grooved in such shape as to produce in the arm F an oscillating motion, which shall in one direction be coincident in velocity with D, and also allow F to rest an instant at one point in its motion. The arm F is attached to the arbor G, which has through its length two holes equidistant at their inner ends from the center. One of these holes is parallel with the arbor's axis, and in this hole plays the rod K. This rod is caused to move inward by the teeth on the ratchet M, which is loose on the arbor G. K is held up against the ratchet by the spring L. M is kept from turning in one direction by the spring-pawl N.

Thus it will be seen that if G is oscillated the rod K will be advanced inward by reason of its contact with incline on tooth of ratchet-wheel until it reaches the end of said incline, when it will be forced back by means of the spring L, and on the return movement of G K brings the ratchet back with it. The other hole in the arbor G changes its direction, so as to lead to the center thereof. Fig. 2 shows these two holes in section.

The wheel D is fast on the arbor H, and on the other end of H is fastened the die-disk I. Through I are three holes, J, as shown in Fig. 3. The functions of these three holes being identical, we will, for brevity's sake, assume that there is but one. Now, this hole is the same distance from the center of the arbor as are the holes in G. The two arbors G and H lie in the same plane, and the face of the disk I comes up close against the end of the arbor G.

Bearing in mind the description of the cam E, it will be seen that, with the parts in motion, H and I turn continuously. When the hole J comes in line with one of the holes in G, G begins to travel with the arbor H. They travel together for a time, after which G turns back again to its starting-point. If it was the hole with the rod K in it, it will be found that the rod has entered the hole J during the time of the two arbors' co-travel, but that it was withdrawn in time for the return oscillation of G.

The arbor H has its body swelled, and through this swell, parallel with the axis of the arbors, play one or more rams, O. We will assume there being but one of the rams. The ram is caused to move inward by the stationary cam P, against which the ram is held by the spring Q.

The shape of the cam P is such that when the hole J coincides with a hole in G, the ram shall be at its farthest back position, and at another time it must force the end of the ram up close against the back of the disk I, leaving room enough for the desired rivet-head.

The operation of the machine is as follows: The wire is fed into the center of G from a feeder or straightener, and is being constantly pressed against the face of the disk I. When J comes around the wire will enter and go through till it reaches the end of the ram O, which now acts as a gage. So far the arbor G has moved with the arbor H, but the former now stops and goes back, and as the latter continues its motion, the wire is sheared off between the two arbors. As the arbor H still goes on, the cam P forces the ram O inward, and so compresses the head on the rivet. Farther on the ram falls back, and the rod K forces the finished rivet out of the hole J. As many holes J may be put in the disk as circumstances dictate, and each of the holes will require a ram. I have shown three of

them, and the pinion C and wheel D must be to each other as one is to the number of holes J.

Thus it will be seen that each revolution of the arbor G makes as many rivets as there are holes and rams.

I claim as my invention—

The intermittently-revolving arbor G and the continuously-revolving arbor H in combination, as and for the purpose specified.

GEORGE A. GRAY, JR.

Witnesses:

JOHN M. DAVIDSON,

JAMES W. SEE.