

J. Howden,

Making Bolts and Rivets,

N^o 42,731.

Patented May 10, 1864.

Fig: 1

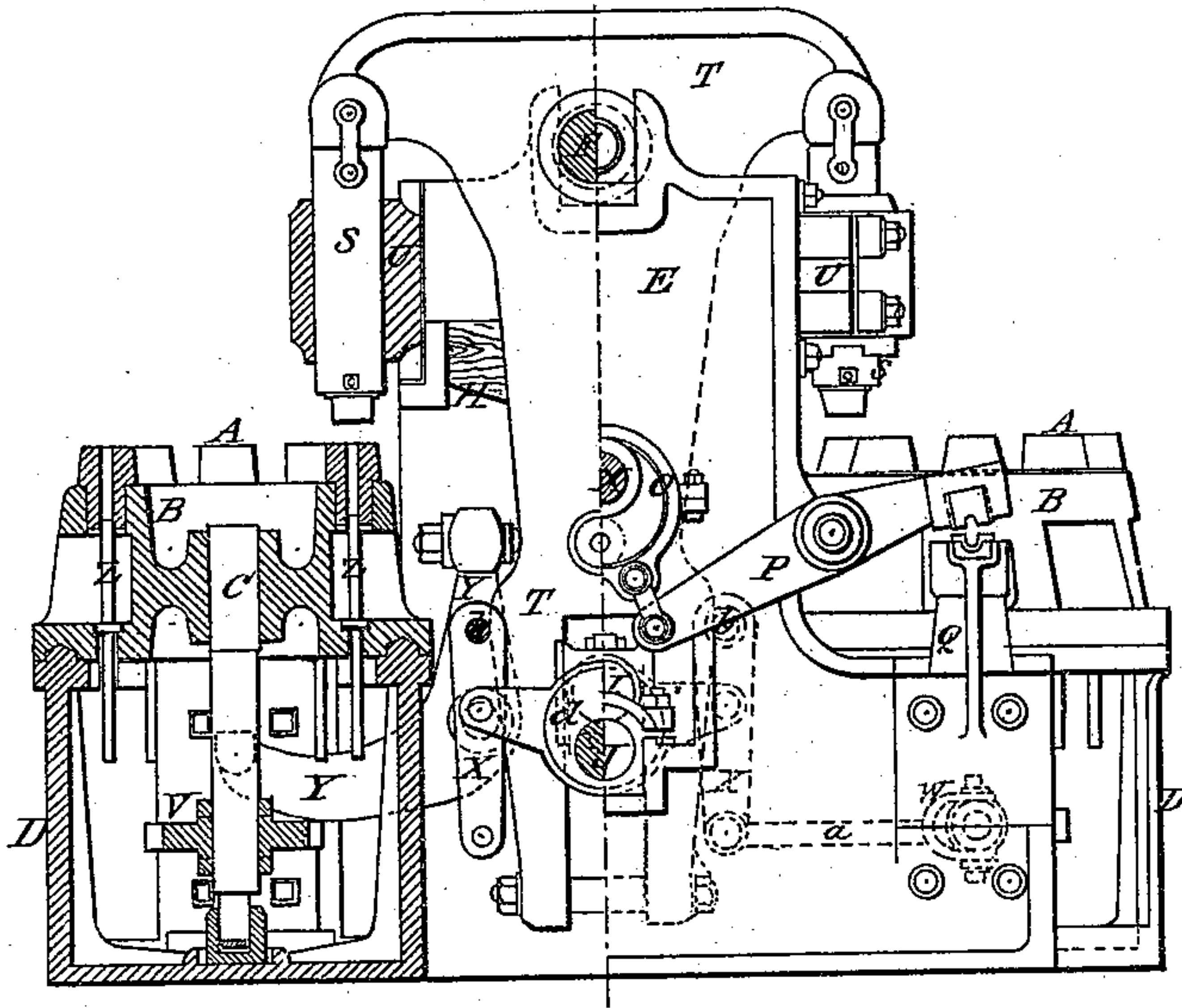
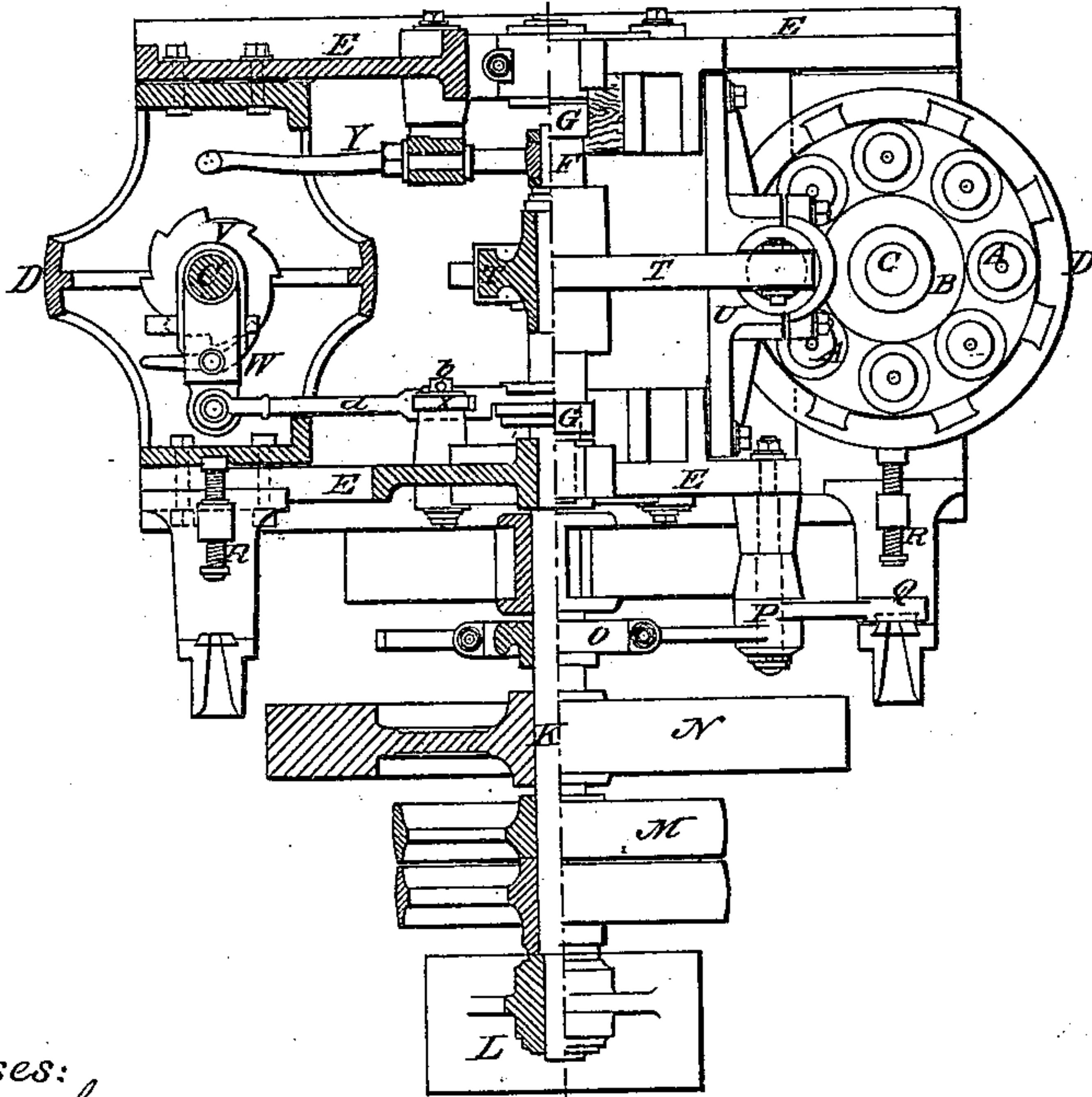


Fig: 2



Witnesses:
J. W. Coombs
G. A. Reed

Inventor:
J. Howden
per Munn & Co
attys

UNITED STATES PATENT OFFICE.

JAMES HOWDEN, OF GLASGOW, SCOTLAND, ASSIGNOR TO WILLIAM AND JOHN GALLOWAY, OF MANCHESTER, ENGLAND.

IMPROVEMENT IN MACHINES FOR MAKING BOLTS AND RIVETS.

Specification forming part of Letters Patent No. 42,731, dated May 10, 1864.

To all whom it may concern:

Be it known that I, JAMES HOWDEN, of Glasgow, in the county of Lanark, in the Kingdom of Great Britain, have invented Improved Apparatus or Machinery for Cutting, Shaping, Punching, and Compressing Metals; and I do hereby declare that the following is a full and exact description of the said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in improved apparatus or machinery for cutting, shaping, punching, and compressing comparatively small pieces of metal, and more particularly for manufacturing the same into bolts or rivets, in which two or more revolving die-tables, carrying the pieces of metal to be acted upon, are so arranged, in combination with a rocking lever, or its equivalent, carrying a number of heading-rams or other tools corresponding with the number of die-tables, that, as the die-tables are made to revolve with a step-by-step motion, thereby bringing a fresh piece of metal to be acted upon beneath each respective heading-ram or other tool, the rocking lever or its equivalent, is at the same time moved in such a corresponding manner that the heading-rams or other tools attached to the same effect the required operation upon the respective die-tables every time that such die-tables have been moved one step and have brought a fresh piece of metal beneath the same.

Levers and rods, or their equivalents, actuated by the rocking lever carrying the heading-rams or other tools, are so arranged as to remove the pieces of metal from the dies in die-table after they have been operated upon by the heading-rams or other tools and cutters, actuated by the same shaft that imparts motion to the rocking lever, or its equivalent, are provided for cutting off the lengths of metal to be acted upon.

Figures 1 and 2 on Sheet I of the accompanying drawings show an arrangement of my improved machine or apparatus adapted for making rivets. Fig. 1 shows an elevation of the same, partly in section, and Fig. 2 shows a plan of the same, partly in section.

The same letters of reference indicate the same parts in both the figures.

In this arrangement the dies A are carried by two circular tables, B, each of which is fixed on a vertical spindle, C, and rests upon a stool, D, formed with a circular Λ -rail fitting a groove formed in the under side of the table B. The stools D are bolted between the opposite ends of two massive side frame-pieces, E, the central portions of which rise up to receive the bearings of a short horizontal shaft, F, carrying the T-lever T. This T-lever is held down by eyed bolts G, strung on the shaft F and secured to two wooden beams, H, inserted beneath lugs cast on the inside of the frame-pieces E. The strain of the heading-rams comes upon these wooden beams H, and by using them a slight elasticity is imparted. The lower end of the T-lever is forked to receive the sliding brasses of a crank-pin, I, and the crank-shaft J, of which this pin forms part, revolves in bearings in the frame-pieces E. This crank-shaft J, the rotation of which causes the T-lever to vibrate, is itself driven by a pinion and spur-wheel from the first motion shaft K, (shown in the plan, Fig. 2,) and turning in bearings at one end in one of the frame-pieces E and at the other end in a pedestal, L.

In addition to the fast and loose driving-pulleys M and pinion for driving the crank-shaft J, the shaft K carries a fly-wheel, N, and an eccentric, O, this last serving to work a pair of levers, P—one at each side of the machine—mounted on a stud in the frame-piece E, and carrying at its free end a cutter which, in combination with a fixed cutter carried by a bracket, Q, cuts off the proper lengths of rod for forming rivets.

The rods are introduced by an attendant between the cutters up to a screw-stop, R, which determines the length to be cut off. The horizontal arms of the T-lever are each connected by short side links to a vertical heading-ram, S, working in guides formed in a transverse frame piece, U, also serving to bind the framing together, and the two rams S are actuated alternately. Each die-table B is shifted round between each stroke of the respective heading-ram, to bring a fresh blank under it, by means of a ratchet-wheel, V, fixed upon its spindle C, and acted upon by a pawl-lever, W. This pawl-lever W is connected by

a link, *a*, to the lower end of a vertical lever, X, which is attached at its upper end to a fixed fulcrum-stud, *b*, secured to the frame-piece E, and is connected with and operated by an eccentric, *d*, on the crank-shaft J. The T-lever is also on each side connected by a link to a bell-crank lever, Y, mounted on a stud in the frame-piece E, the other end of this lever Y being so situated as, at the proper periods, to push out of the dies A the newly-formed rivets, which is done by means of vertical spindles Z, one of which passes through the bottom of each die A and rests by a collar in the bottom flange of the table B. The spindles Z are each in two pieces, the upper part being capable of being changed to suit different lengths of rivets; or washers may be inserted beneath the collar of the lower part for the same purpose.

A contrivance (not shown in the drawings) may be added to the machine to lock each die-table exactly in the proper position whenever the heading-stroke is about to be made. This contrivance consists of a bolt which enters a notch or recess in the die-table, and the point of the bolt or the sides of the notches or recesses are beveled, so that if the table is not exactly in position the point of the bolt will, on entering, force it round as much as may be required.

Although I have described my improved apparatus or machinery as applied to the manufacture of rivets only, yet it will be evident that by substituting different dies and tools for those described and shown this apparatus may be applied for any other process requir-

ing the cutting, shaping, punching, and compressing of metals.

Having thus particularly described my said invention and the manner in which the same is or may be used or carried into effect, I have to state that I do not restrict myself to the precise details hereinbefore described or delineated, and that I do not claim to have invented every separate detail hereinbefore described and delineated; but that

What I believe to be novel and original, and claim as the invention secured to me by the hereinbefore, in part, recited Letters Patent, is—

1. The combination of two or more revolving die-tables having a vertical axis with a single lever for actuating the heading-rams, when the parts are constructed and arranged as and for the purposes herein specified.

2. In combination with the aforesaid die-tables, heading-rams, and lever, the bell-crank levers Y, operated in the manner and for the purposes described.

3. The combination of the oscillating cutting-levers P, eccentric O, and shaft K, when constructed and operated as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of October, 1863.

JAMES HOWDEN.

Witnesses:

JOHN M. ROBERTSON,
Of the city of Glasgow, Solicitor.
GEORGE ROBERTSON,
Of the city of Glasgow, Clerk.