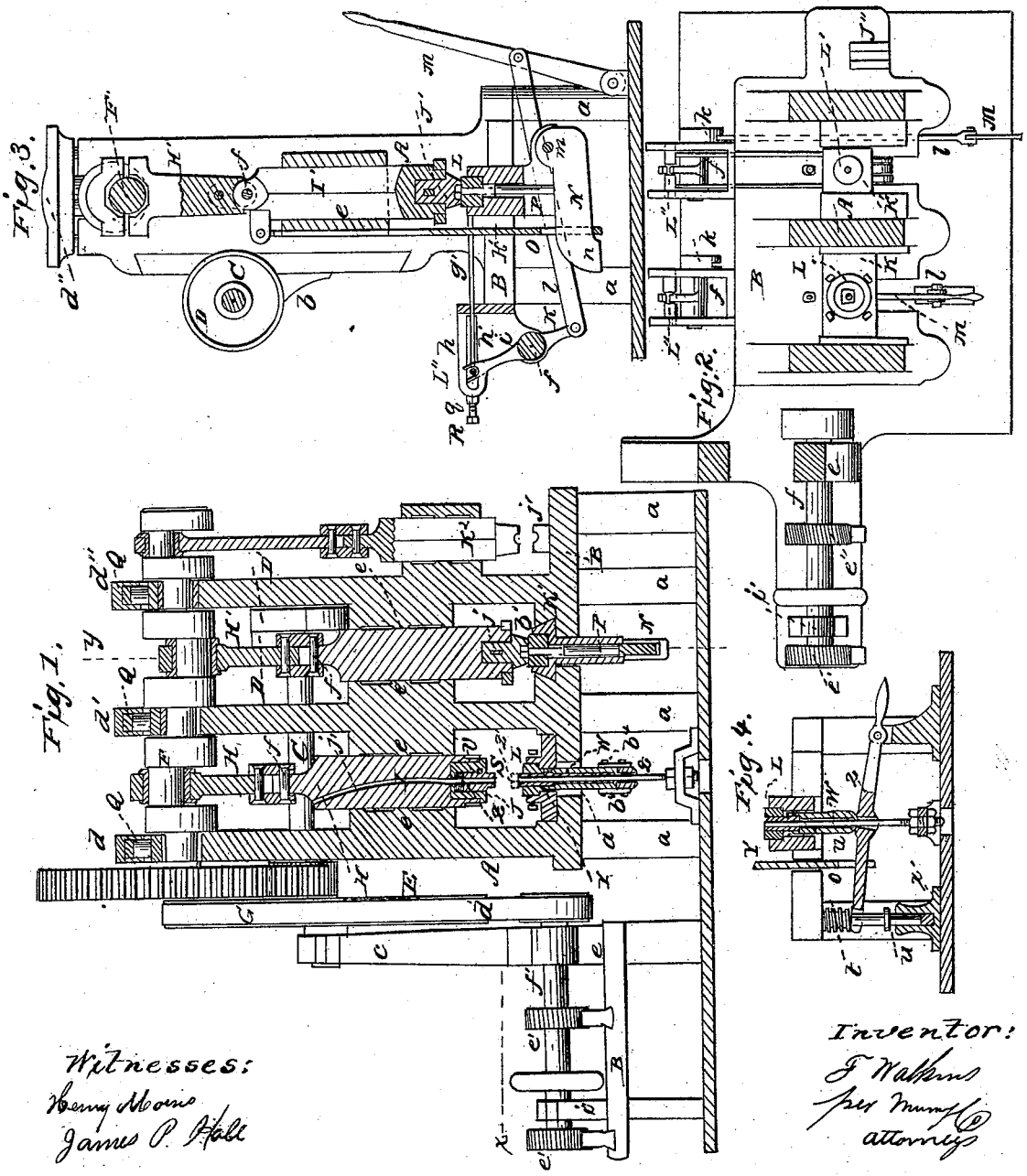
F. WATKINS.

Bolt Machine.

No. 46,434. Patented Feb. 14, 1865.



Witnesses:
Henry Moore
James P. Hall

Inventor:
F. Watkins
per Munn & Co
attorneys

UNITED STATES PATENT OFFICE.

F. WATKINS, OF LONDON WORKS, BIRMINGHAM, ENGLAND.

MACHINE FOR HEADING BOLTS.

Specification forming part of Letters Patent No. **46,434**, dated February 14, 1865.

To all whom it may concern:

Be it known that I, F. WATKINS, of London Works, Birmingham, England, have invented a new and Improved Bolt-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional front elevation of this invention. Fig. 2 a horizontal section of the same, the line *x x*, Fig. 1, indicating the plane of section; Fig. 3, a transverse vertical section of the same, the plane of section being indicated by the line *y y*, Fig. 1. Fig. 4 is a section in the line *z z*, Fig. 1.

Similar letters of reference indicate like parts.

This invention relates to a machine for making bolts, spikes, and rivets. The said machine is constructed with a vertical slide or slides, carrying at their lower ends removable dies corresponding with the size and form of the heads required. The heading-tools are inserted in a movable carriage or carriages, and they are provided with holes or sockets corresponding with the body or shank of the bolt. The carriages are moved horizontally, in order that the operative may conveniently place the blank or remove the bolt, spike, or rivet when completed. The articles, after having been operated upon by the header, are partly removed from the heading-tools by suitable levers and india-rubber, and other suitable springs are introduced in order to furnish a yielding bearing necessary for the safe working of the machine. The different parts are so arranged that the machine may be used for making bolts, spikes, or rivets, or the machine may be used for making two different kinds of bolts of different dimensions at the same time. For the sake of cheapness, the heading tools and dies are made of cast-iron with chilled surfaces.

A represents the main frame, which may be constructed in any convenient form, and supported by the legs *a*, which are bolted to the bed-plate B. The driving-shaft C, having its bearings in the brackets *b* and standard *c*, receives motion by the tight and loose pulleys D D′. This shaft is provided with a fly-wheel, E, and pinion F, working in the spur-wheel G, so as to give a slow motion to the crank or eccentric shaft F′. The said shaft has its bearings on the main frame A, and is secured by caps *d d′ d″*, the said shafts being cut or turned down between the bearings, so as to form eccentric wrists for the purpose of giving motion to the connecting-rods H′, and through them a vertical reciprocating motion is imparted to the slides I. The slides I work in the guides *e*, and have at their upper ends projections *f*, (see Fig. 3,) and at their lower ends mortises, into which the die J′ is secured.

K′ is a movable carriage, having a large recess in its upper end, in which the heading-tools L′ are secured. These heading-tools are perforated with holes near their centers, corresponding with the body or shank of the bolt. The sliding carriage K′ is connected to the cross-head L″ by the rods *g′*. The cross-head L″, Fig. 3, works in the guides *h h′*, and it is operated upon by the arm *i* of the rock-shaft *f*, and the rock-shaft *f* is connected to the arm *k*, which connects by the link *l* to the hand-lever M. By this arrangement a reverse motion may be given to the sliding carriage K′. The lever N, Fig. 3, is hung by the pivot *m* to the carriage K′, and it is provided with a projection, *n*, and works through a slot in the stirrup *o*, the said stirrup *o* being connected to the slide I′.

P is a puppet resting on the lever N, and extends to the bottom end of the bolt, and the various puppets are removable, so as to adapt them for making bolts of different length. The journals of the eccentric shaft F′ are held down by india-rubber springs or cushions Q, and adjustable set-screws R, with check-nuts *q*, serve to stop the carriage K as required.

A belt *d′* from the fly-wheel E to the shaft *f* serves to work the fraser or finisher *e′*, used for the purpose of removing any frase or bur that may be left on the bolts, spikes, or rivets. The fraser or finisher *e′* is supported upon standards *i′* and *e*, which are firmly secured to the bed-plate B, and suitable rests serve to present the articles to be frased to the cutters.

A changeable cutter, *j′*, bolted to a continuation of the frame A, and operating in conjunction with a movable cutter, K^2, serves to cut the iron to be worked by this machine.

The operation is as follows: In order to insure the proper working of the machine, blanks of the proper size are brought within

reach of the operatives, with a sufficient portion of the ends which are to receive the heads heated. The machine being put in motion and the hand-levers M M′ moved in, the sliding carriage K′ is brought out, so that the prepared blanks may be inserted in the holes in the heading-tools L′, with their lower ends resting on the puppet P, and a sufficient portion of the heated end projecting from the top to form the head. At the time the slide I′ is at or near the upper portion of its stroke, and the hand-levers brought out, as shown in Fig. 3, the heading-tool with the blanks is carried under the heading-die, which, as it is brought down by the eccentric, forces the metal into the cavity in the die, forming the head, and also upsets the metal in the heading-tool, forming the shank to the shape required. Should there be more stock left protruding from the heading-tool than enough to form the head and shank required, the yielding nature of the rubber placed over the box of the eccentric shaft will prevent undue straining or breaking of the various parts.

As the die J′ in its upward motion leaves the head of the articles formed, the carriage K′ is again brought out as at first, and the bottom of the stirrup *o*, catching under the projection *n* of the lever N, raises the same, which, acting upon the puppet, lifts the bolt or article from the heading-tool, so that the same may by means of a pair of tongs be removed, and the operation repeated.

I claim as new and desire to secure by Letters Patent—

The bolt-machine herein described, consisting of the eccentric shaft F′, slide I′, removable heading-dies J′ L′, sliding carriage K′, lever N, puppet P, and connecting-rod *o*, all constructed, arranged, and operating as specified.

F. WATKINS.

Witnesses:
I. M. G. UNDERHILL,
Consular Agent, U. S.
JAMES H. ROUS,
Clerk to the said I. M. G. Underhill.