R. BRAYTON.

MACHINE FOR MAKING NUTS AND WASHERS.

No. 12,194. Patented Jan. 9, 1855.

Fig. 6.

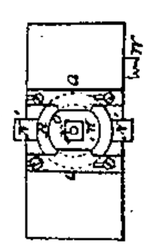


Fig. 7.

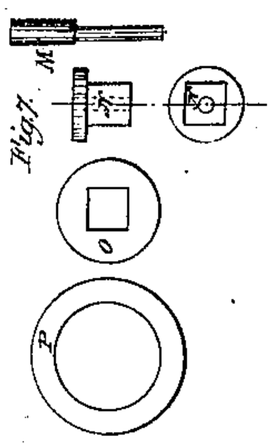


Fig. 5.

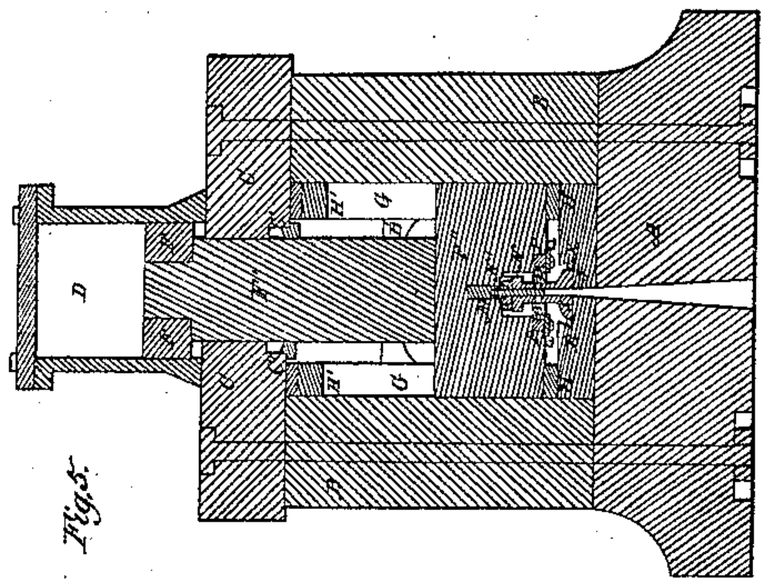


Fig. 3.

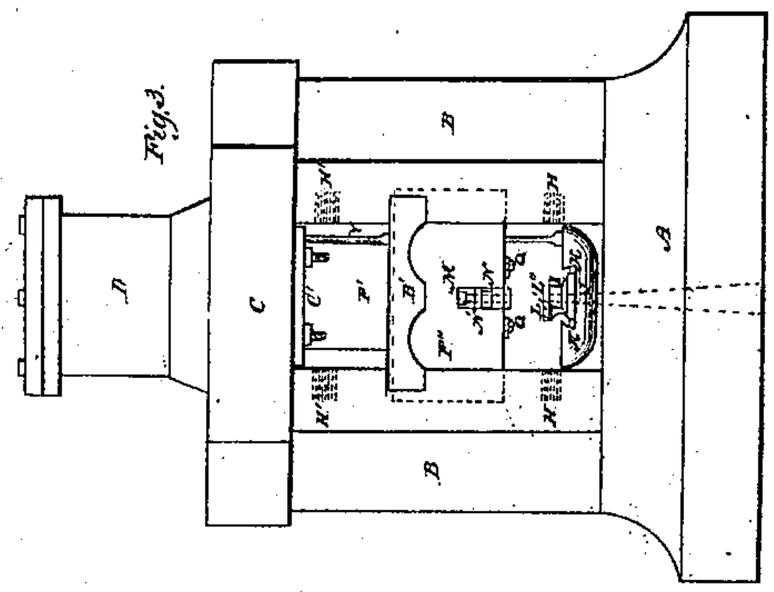


Fig. 4.

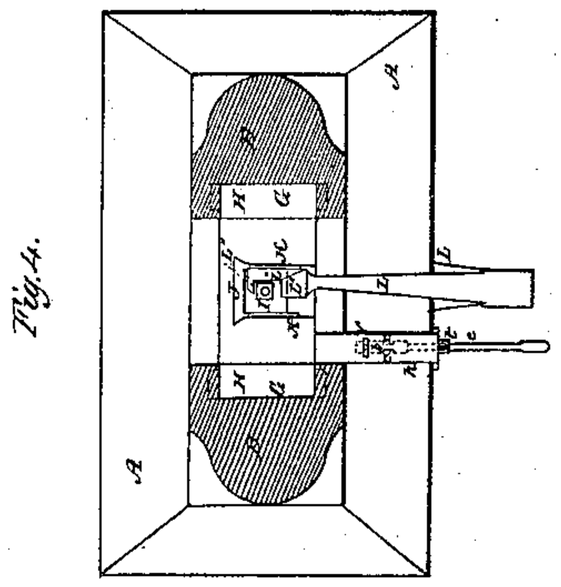


Fig. 1.

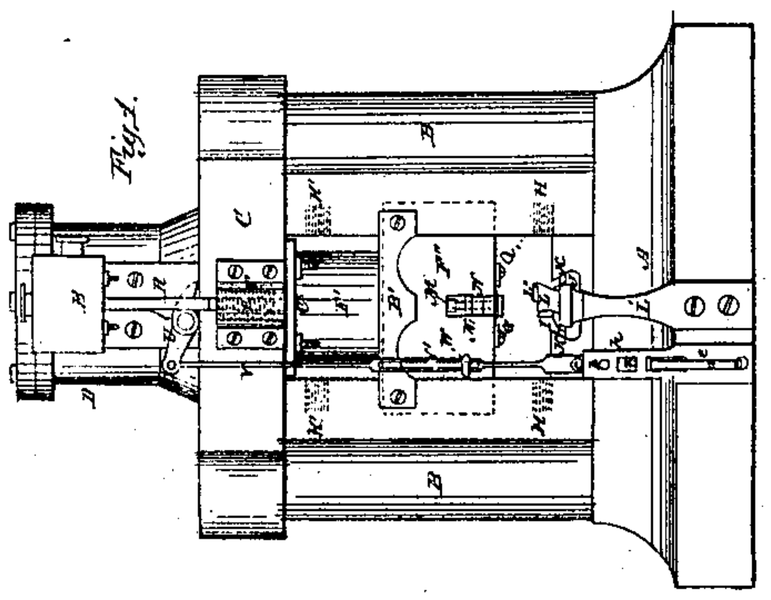
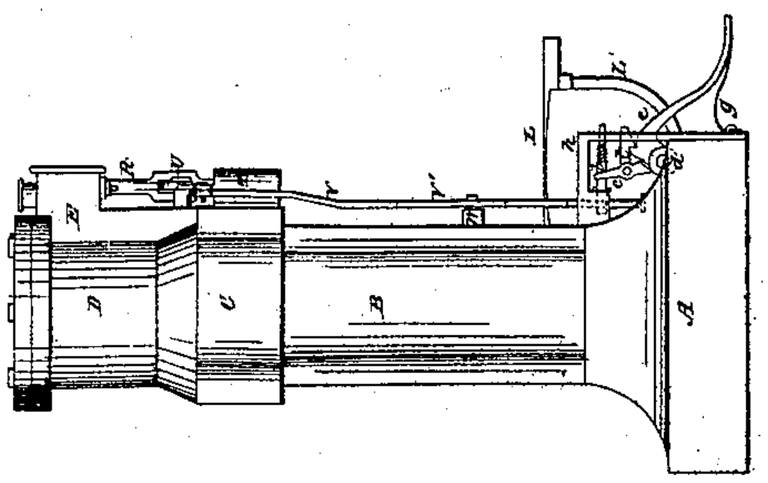


Fig. 2.



UNITED STATES PATENT OFFICE.

ROBERT BRAYTON, OF BUFFALO, NEW YORK.

MACHINE FOR MAKING NUTS AND WASHERS.

Specification of Letters Patent No. 12,194, dated January 9, 1855.

To all whom it may concern:

Be it known that I, R. BRAYTON, of Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Machine for Making Nuts and Washers; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification.

Figure 1 is a front elevation; Fig. 2, an end elevation; Fig. 3, a back view; Fig. 4, a transverse section in the direction of the lines *x x* in Figs. 1 and 3; Fig. 5, a vertical section, the other views are detached sections which will be referred to in description.

Like letters designate like parts in the several figures.

The devices for making the nuts and washers are attached to a piston rod operated by the action of steam or compressed air in making nuts and washers and also for discharging the same from the forming box when made. By this means the dies acquire a power double, effective, and instantaneous, by the gravity of piston, rod, head block, &c., and the force of steam on the piston. As the nuts and washers are thus formed in the box and discharged by an instantaneous and percussive action and reaction of the piston the punch and dies are not injured by the heat from the bar. In the ordinary machines the dies and punches are continuous in the mode of operation and comparatively slow, as the blank is first cut off from the bar, then punched, and compressed into shape or by other continuous modes of operation substantially the same, whereby the dies and punches consequently remain longer in contact with the heated metal and soon become impaired, and imperfect nuts and washers made thereby.

The movements of the piston and dies are controlled and operated by a steam valve in combination with other suitable means as hereafter described whereby the motive power is applied alternately to each end of the piston as may be required.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation with reference to the drawings.

A, the bed plate upon which rests the columns B, B. These columns support the top plate C, and cylinder D, the sections A, B, C, constitute the frame work of the machine and are secured together by bolts in any desirable manner.

The steam cylinder D, is attached to the top plate C, on the underside of which is the piston rod stuffing box C′. To the cylinder is secured the steam chest E, Figs. 1 and 2, provided with receiving and exhaust pipes, and communicating with the cylinder in the ordinary way. F, Fig. 5, the piston secured to the piston rod F′, the lower end of which forms the head block F′, which slides in the guides G, G, formed in the columns. At each end of the guides are secured a series or combination of metallic plates H H, H′ H′. The plates H′ H′, ease the action of the machine at the termination of the back stroke, as the head block is brought in contact with the plates directly after the nut is thrown out. The plates H, H, ease the action of the punch and dies and prevent them from straining when brought in contact in forming nuts and washers and also gage the nut or washer to any uniform thickness according to the number of plates. But at the same time steam may be received into the cylinder at either end so as to act in concert with the plates if desirable.

The die block I, is secured to the anvil J, by the side keys K, K, by which it is readily adjusted and keyed in place.

L, is a spring guide supported and attached to the bed plate by the brace L′. One end of the spring surrounds the upper portion of the die block on three sides as seen in Fig. 4, and is raised forming a shoulder above the die block, as seen in Figs. 1 and 3, but only on two sides L″ L″, Fig. 4, which may be a little above the die block thereby it does not become heated as would be the case if the bar rested upon the die block. By means of this guide the bar is quickly adjusted in place for the dies. The punch M is fitted to the head block and extends through the check N, and check plate N′, so that they slide independently of the punch. The check N, is fitted to slide also in the forming box O, while the box is secured in the case or ring P. The box O, and case thus combined is attached to the head block F″, by bolts, and plates, as seen at Q, Q, Fig. 6.

Fig. 7 represents in sections the devices described as being directly employed in making nuts and washers, and Fig. 8, shows a vertical section of the combination of the same.

The motive power being admitted to the

upper end of the piston, the head block descends to the position seen in Fig. 5, which causes the die block I, to pass a little into the forming box O. By this contact the nut is punched by the punch passing into the hole of the die block, and is cut off from the bar by the contact of the die block I, and forming box O; the nut or washer being compressed into shape in the chamber of the forming box. Thus the nut or washer is punched, cut off from the bar and swaged into form simultaneously at one blow or stroke of the piston, and by the reverse stroke the nut is thrown out from the forming box. As the nut is being forced into the chamber of the forming box, the check N, which slides in it, rises from the position seen in Figs. 1 and 2, to that shown in Fig. 5. When the check plate N′, is raised up against the head block, by the check N, then stops, until the nut is thrown out, by the check plate being brought in contact with the check bars B′ B′, when it drops down as seen in Figs. 1 and 3. The nut is made and discharged by a percussion or stroke of the piston and so instantaneous as not to injure the tools by the heated metal, which distinguish it from all others in use.

R, Figs. 1 and 2, is the valve rod to which is attached by a nut at the lower end, a spiral spring S, in the case T, as indicated by the dotted lines in Fig. 1. The rock shaft U, works upon a wrist attached to the frame and one end plays in a slot in the valve rod and the other end is connected to the reversing rod V, by a pin joint. W, is a reversing pin attached to the head block and plays in the reversing link V; which is a part of the rod.

The lower end of the rod is flat in which is the hole *a*, for the reception of the check bolt *b*, which passes into the hole by the force of the spiral spring attached to it as seen in Fig. 2. The finger *c*, loosely clasps the check bolt on each side as seen at *c*, *b*, Fig. 4, where there is a shoulder on the bolt which allows the finger to withdraw it from the hole *a*. The lower end of the finger works upon a pin joint at *d*, Fig. 2, with the trigger *e*. The catch *f*, is connected to the finger *c*, by a pin joint and catches into the trigger *e*, as shown in Fig. 2.

When the piston is up the trigger is supposed to be in the position shown and when it is detached from the catch the piston descends and the trigger is thrown back in place by the spring *g*. *h*, is a brace attached to the frame for securing the devices in place. The head block F″, and piston being up and the trigger in place, by lightly pressing upon the trigger *e*, the check bolt *b*, is drawn out of the hole *a*, in the reversing rod, at that instant the steam valve is reversed by the spiral spring S attached to the end of the valve rod, and the steam applied to the upper side of the piston. The down stroke of the piston being simultaneous with the head block and as the head block descends, the reversing pin W comes in contact with the lower end of the link V′, thereby reversing the steam valve so that the head block ascends, and by means of the check bolt *b*, entering the hole *a*, in the reversing rod V, as it descends by the action of the reversing pin W, the head block is held by the force of steam on the under side of the piston in its former position, ready to descend again on pressing the trigger *e*. On the instant the check bolt is withdrawn from the reversing rod, the piston, and head block, make an instantaneous double stroke forming the nut or washer by the punch and dies on the descent of the piston and detaching the nut or washer on the ascent, in the manner before set forth.

I design to arrange the reversing link and rod, in connection with the rock shaft U, so as to cut off steam by the reversing pin W, at any desirable point of the down stroke.

I do not intend to confine myself to a vertical position in using the machine, nor explicitly to the herein described arrangement. I do not contemplate changing the principle of its construction or operation in so doing.

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

1. The arrangement of the forming box O, case P, secured by the plate Q, to the head block F″, operated by the piston F, in the cylinder D, as described, in their relation to the check N, check plate N′, check bars B′, B′, punch M, and die I, for the purposes and as herein set forth.

2. I claim the metallic plates H H, and H′, H′ as arranged in the slides G, G, in relation to the head block F″, for the purposes described.

3. I also claim the spring gage bar L, the same being to protect the bed die from the heat of the blank or nut bar and also to gage its feed as set forth.

ROBT. BRAYTON.

Witnesses:
THAD P. SEARS,
A. O. HUNTINGTON.