

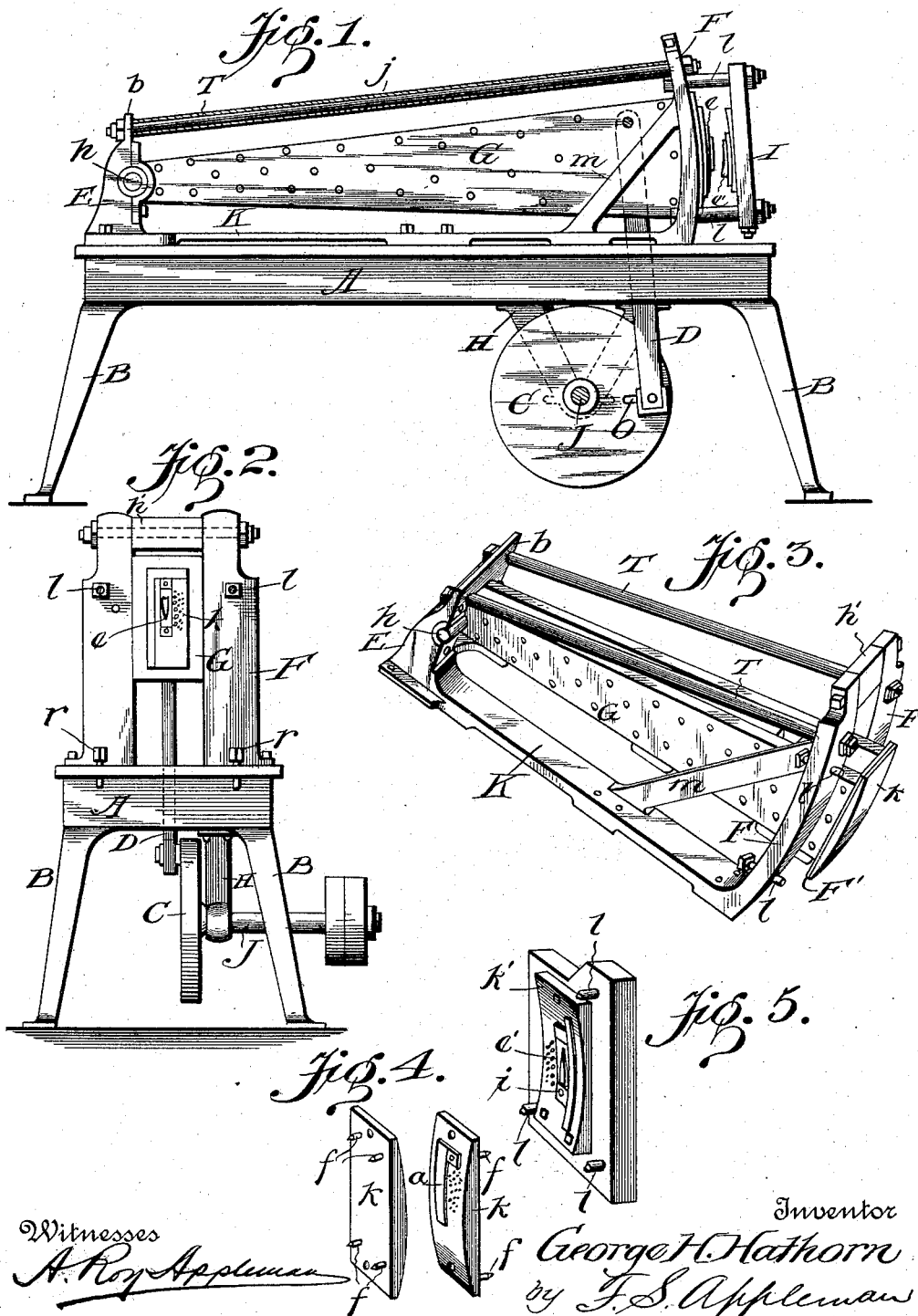
No. 609,202.

Patented Aug. 16, 1898.

G. H. HATHORN.
SWAGING MACHINE.

(Application filed July 24, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

GEORGE H. HATHORN, OF BANGOR, MAINE, ASSIGNOR TO THE DIRIGO BALL MANUFACTURING COMPANY, OF SAME PLACE.

SWAGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 609,202, dated August 16, 1898.

Application filed July 24, 1897. Serial No. 845,821. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HATHORN, a citizen of the United States, residing at Bangor, in the county of Penobscot and State of Maine, have invented a new and useful Forging-Machine; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it apper-
10 tains to make and use the same.

My invention relates to an improved swaging-machine for swaging small articles; and it consists of the construction hereinafter set forth, throughout the description of which
15 reference is made to the accompanying drawings, forming part of this application, in which—

Figure 1 shows a vertical side elevation of my machine complete, with section through
20 tubing on upper tie-rod. Fig. 2 shows a vertical front end view of my improved swaging-machine with the head removed. Fig. 3 is an isometric view of the upper part of my machine, showing construction of same.
25 Fig. 4 represents isometric views of front and back of die-holders as constructed for forward end of swinging arm of my improved swaging-machine. Fig. 5 shows a similar view of the head of my device, showing con-
30 caved die-holder thereon with die attached.

Similar letters of reference refer to correspondingly like parts throughout the several figures.

This machine consists of a platform A,
35 constructed similar to an engine-lathe bed, having the usual central slot running longitudinally therein and supported in a horizontal position by legs B B. Upon the top of the platform which forms the stand A is
40 bolted the frame of my invention, which is constructed with right-angular projections rising from each end, one of which is cast similar to a pillow-block, having its journal-bearing extending transversely and facing
45 the opposite end of the machine—that is, the cap to the box is placed upon the side facing the opposite end of the machine.

The upright projections at the forward end of the frame are cast in the form of an arc

on a radius equal to the distance to the cen- 50
ter of the journal in the pillow-block E. These forward upright projections are two in number, forming guides F F, parallel with each other, with their facing edges dressed and separated at their upper extremities by
55 a filling-block *h'*, through which a bolt passes, holding them rigid against lateral movement. The guides F F are stiffened longitudinally by braces *m m*, extending to the base K of the frame. They are further strengthened
60 in this direction by tie-rods T T, connecting their upper ends to the top of the pillow-block E, and tubes *jj* are placed upon these rods, said tubes being of such length as to fit between the guides F and the extension *b*
65 at the top of the pillow-block, against which the nuts at the extremities of the tie-rods are screwed. This arrangement produces a continuous strain upon the tie-rods T T, and when force is applied to these parts when oper-
70 ating the machine there will not be as much give or stretch of the tie-rods as there would be if the latter were made with a shoulder against which the parts are screwed. In this last instance, there being no continuous
75 strain upon the tie-rods, when force is applied they would naturally stretch to a certain extent before they offer complete resistance, while in the first instance, with the rods under continuous strain, before the force is ap-
80 plied their elasticity is destroyed. Consequently they form a perfect rebuttal to opposing force.

Between the guides F F is adapted to reciprocate one end of an arm G, which is pro-
85 vided at its opposite end with a transverse shaft *h*, rigidly fastened therein, the protruding extremities of which are inclosed in the journal-box within the pillow-block E. The forward end of the swinging arm G protrudes
90 slightly beyond the guides F, and has a head F' of sufficient size in cross-section to receive a die-holder *k*, which can be attached thereto in any good and sufficient manner; but in the drawings I have shown this die-holder *k* pro-
95 vided with dowels *ff*, protruding from its rear face, which are adapted to enter holes drilled in the head of the swinging arm to re-

ceive them and prevent displacement of the die-holder in a lateral direction. The die-holder *k* is then fastened by two or more bolts screwed therein at convenient places. This arrangement allows the die-holder to be removed and replaced without variation of adjustment or readjustment of the swaging-die usually secured thereto.

The front face of the die-holder *k* is made slightly convex in shape, the convexity being planed on an arc the radius of which is equal to the distance to the pivotal point of the arm *G*. Extending longitudinally on the convex side of the die-holder *k* is a protruding ridge *a*, having an overhanging edge against which a swaging-die is placed. The opposite edge of the die is secured to the convexity of the die-holder by a line of screws entering tapped holes drilled in the said die-holder. The heads of said screws bearing against the beveled edge of the die will gradually force the latter in place, as is shown in Fig. 2 of the drawings. The swaging-die *e* is prevented from moving in a longitudinal direction by small plates *i i*, placed above and below the die and fastened by screws to the die-holder.

In front of the forward end of the arm *G* at a proper distance from the die-holder *k* is fastened, in an upright position, a rectangular-shaped block *I*, which in practice I term the "head" of my device. This head *I* secure to the frame of the machine by bolts *l*, passing through the guides *F* and entering three of the corners of the head *I*, as shown in Figs. 1, 3, and 5 of the drawings. Upon the inside of the head *I*, I fasten by bolts or otherwise a die-holder *k'*, having its face curved to coincide with the die-holder *k* upon the end of the arm *G*, and upon this concaved side is planed a longitudinally-extending ridge *a'*, with a corresponding overhanging edge, against which a similarly-concaved die *e'* is placed, corresponding with the opposite convex die *e* on the convex die-holder *k*. This concaved die *e'* is secured to the die-holder *k'* in the same manner as hereinbefore described in regard to the attachment of the die *e* and should so aline with this last-mentioned die as to form a complete swaging from a bar of metal placed between them when the moving die *e* passes the stationary die *e'* in operating the machine. The stationary die *e'* is adjusted to aline with the moving die *e* by the use of set-screws *rr* on this end of the platform *A*, upon the heads of which the lower edge of the head *I* rests, and for the proper distance for separating the dies to produce a perfect swaging adjustment is accomplished through the means of the confining-bolts *ll* and the nuts thereon.

For reciprocating the forward or die end of the swinging arm *G*, I pivot a connecting-rod *D* thereto and connect the opposite end of the latter to a crank-wheel *C*, which is fastened to a shaft *J* beneath the machine.

In the drawings I have shown the shaft *J*

supported by a hanger *H*, attached to the under side of the platform *A*; but it is not essential to adhere strictly to this construction, for any good and sufficient manner of supporting the power-shaft *J* beneath the machine will answer just as well. The wrist-pin, attaching the lower end of the connecting-rod *D* to the crank-wheel *C*, should enter a radial slot *o*, made in said wheel, and be so constructed as to allow adjustment within said slot for the purpose of lengthening or shortening the stroke to accommodate dies of different lengths used in this machine.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a swaging-machine, an oscillating beam, guides arranged on either side of the swinging end of said beam, a head secured to said guides a die-holder on the head and means for oscillating said beam, as and for the purpose set forth.

2. In a swaging-machine, a platform, an oscillating beam mounted thereon, guides arranged on either side of the swinging end of said beam, bolts run through said guides, a head held substantially parallel with said guides by said bolts, a die-holder adjustably arranged on the head and means for oscillating said beam, as and for the purpose set forth.

3. In a swaging-machine the combination with a horizontal platform, of a frame secured to the top of the same, said frame consisting of a pillow-block with transverse journal-bearing and an extension above said bearing; curved uprights parallel with each other and connected at the base with said pillow-block; tie-rods connecting the upper ends of said guides and pillow-block; and tubes inclosing said tie-rods and separating said guides and the upper end of said pillow-block; a rectangular head bolted to said guides; set-bolts adapted to adjust said head; a concaved die-holder on inner face of said head with means for securing a die thereto; a swinging arm with one end adapted to reciprocate between said guides, and its opposite end provided with a transverse shaft inclosed in said pillow-block; and means for reciprocating the die end of said swinging arm by attachment to suitable power medium, for the purpose described and substantially as shown and set forth.

4. In a swaging-machine a beam pivoted at one end with its opposite end adapted to reciprocate between guides; means for reciprocating the free end of said swinging arm by suitable connection with a power medium; a die-holder at the swinging end of said beam, said die-holder having a convex face curved to correspond with the swinging radius of the beam, and having a longitudinally-extending ridge and means for securing a swaging-die thereto; a stationary block or head rigidly fastened in front of said convex die-

holder, said block having means for attaching a concaved die-holder having its face curved on an arc having for a radius the distance to the pivotal point of the swinging
5 beam, said concaved die-holder having a longitudinally-extending ridge with overhanging edge and means for securing a similarly-

concaved forging-die to aline with the die on the convex die-holder, all for the purpose described and substantially as set forth.

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Witnesses:

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