D. H. HATLEE. 3 Sheets—Sheet 1.

Machine for Making Horseshoes.

No. 206,726. Patented Aug. 6, 1878.

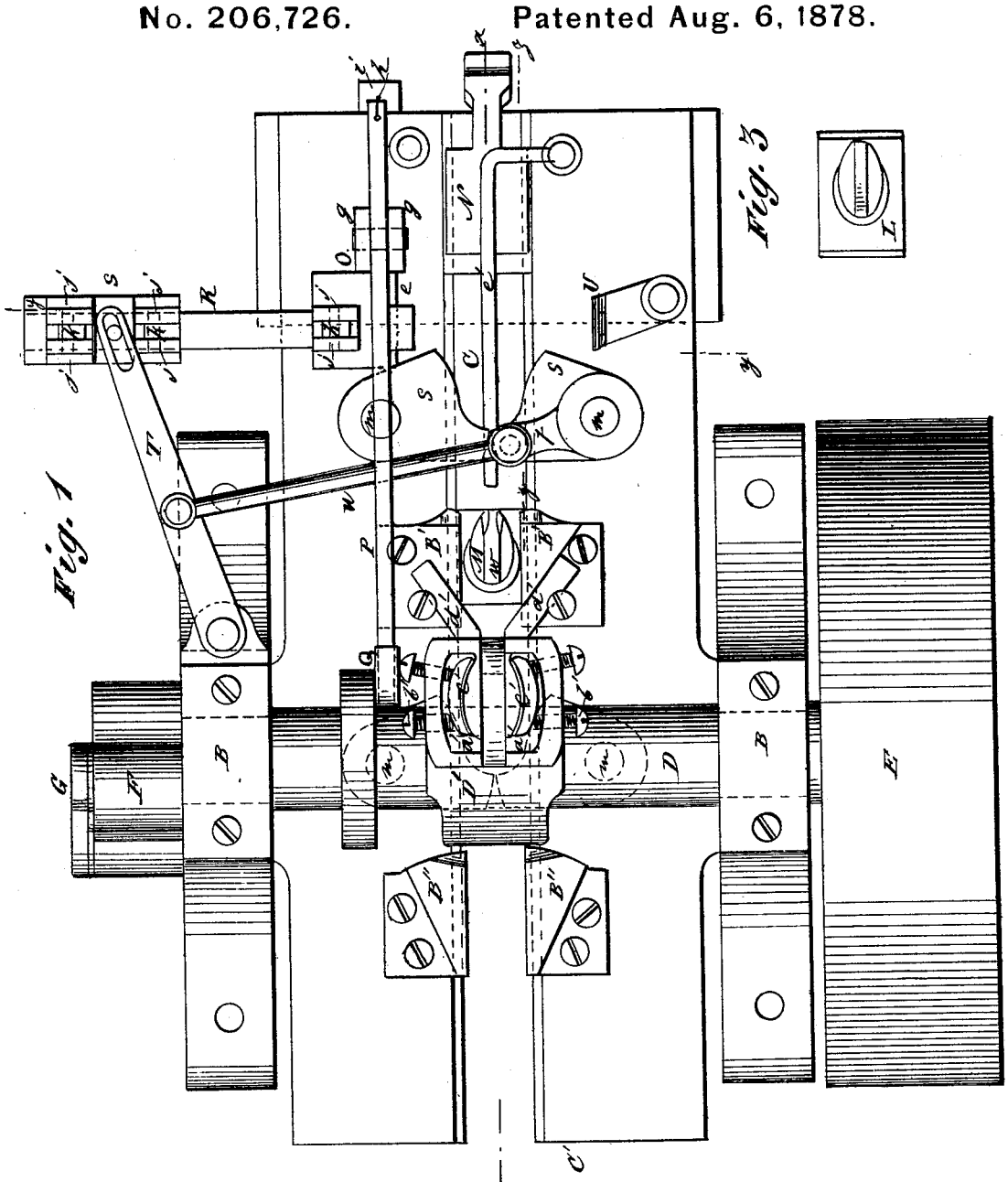


Fig. 1

Fig. 3

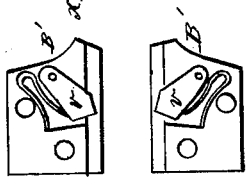


Fig. 2

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

D. H. Hatlee

BY Munn & Co

ATTORNEYS.

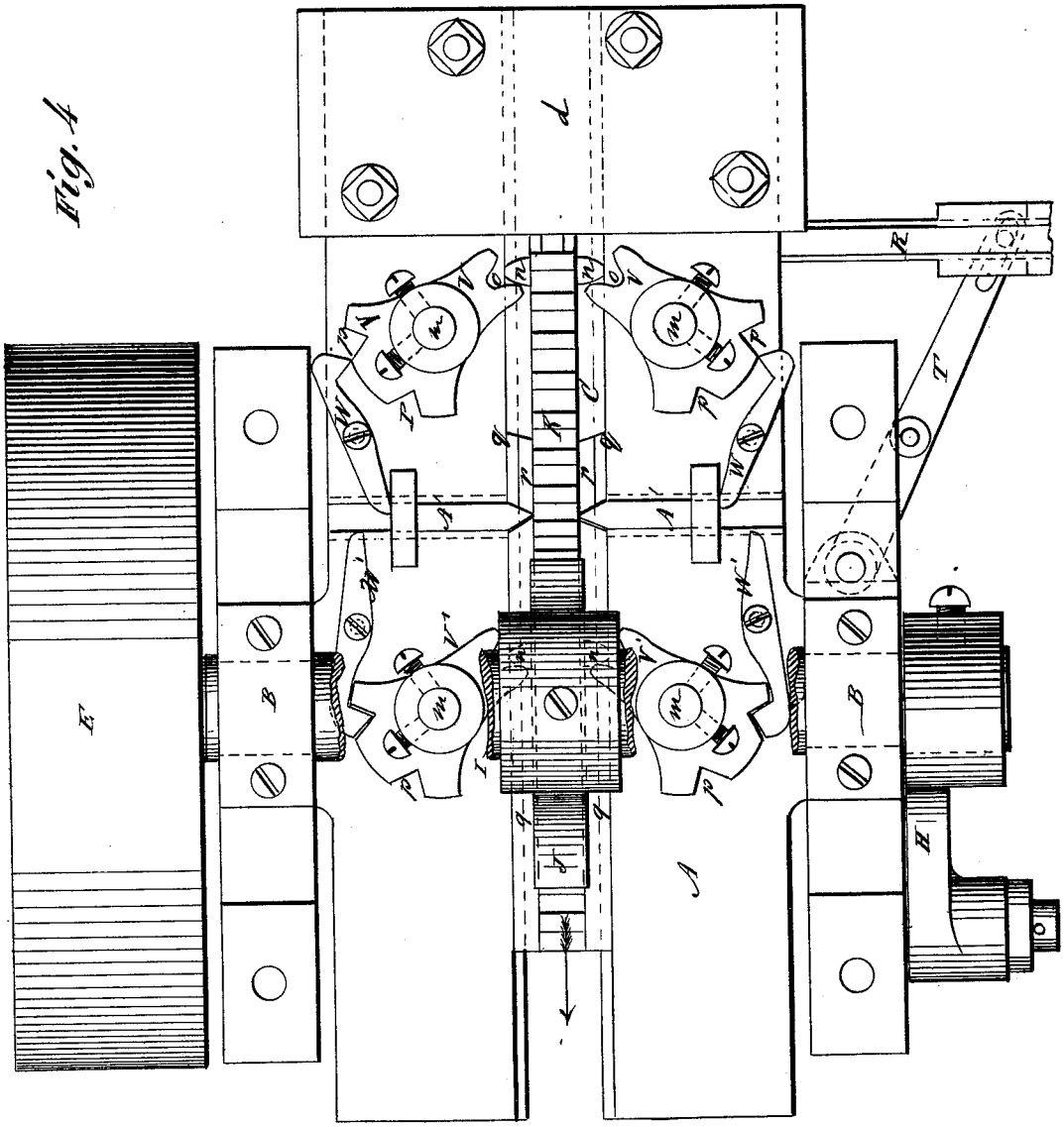
3 Sheets—Sheet 2.

D. H. HATLEE.

Machine for Making Horseshoes.

No. 206,726. Patented Aug. 6, 1878.

Fig. 4.



WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

D. H. Hatlee

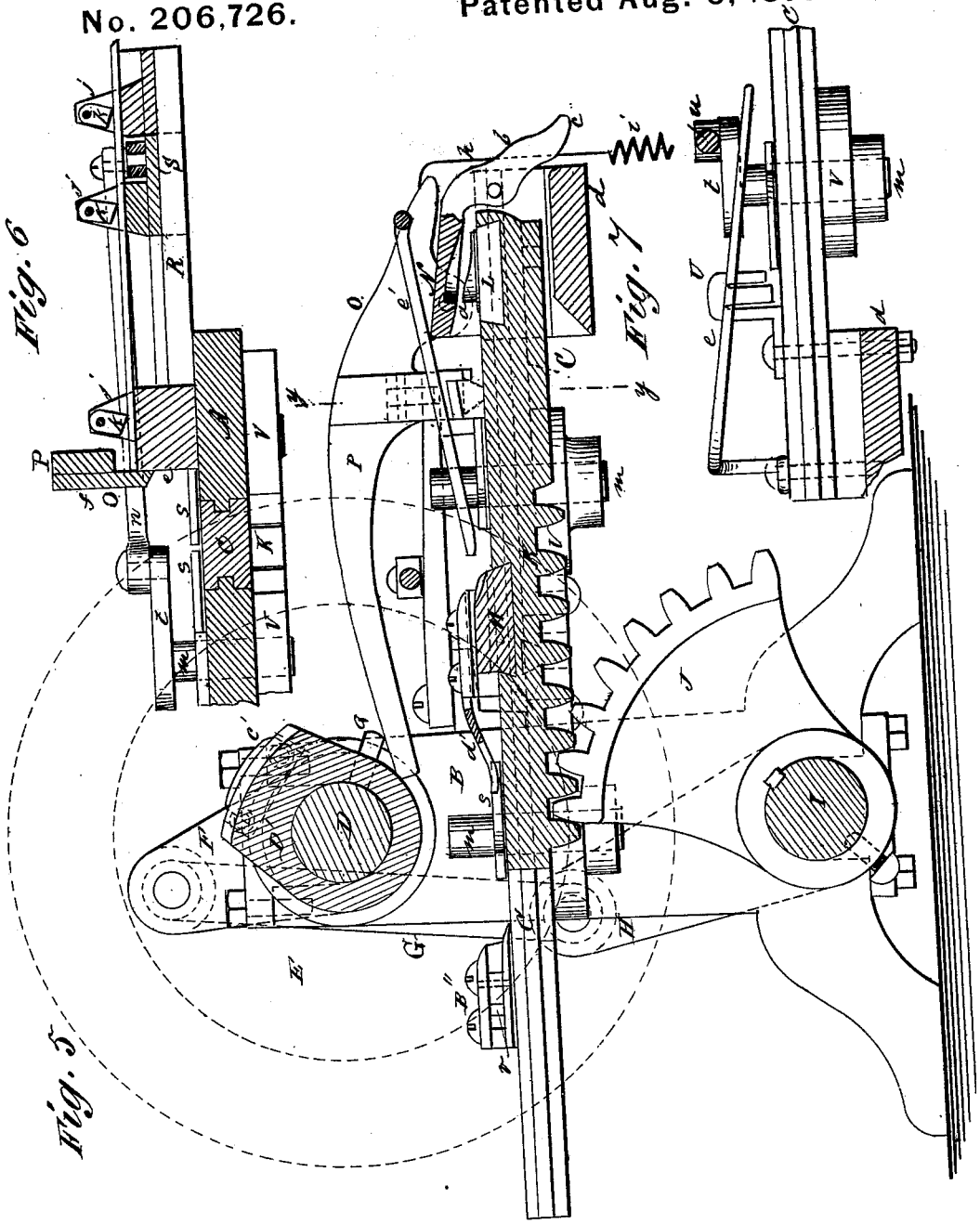
BY Munn & Co

ATTORNEYS.

D. H. HATLEE.

Machine for Making Horseshoes.

No. 206,726. Patented Aug. 6, 1878.



WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

D. H. Hatlee

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

DAVID H. HATLEE, OF CLIFTON PARK, NEW YORK.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOES.

Specification forming part of Letters Patent No. **206,726**, dated August 6, 1878; application filed May 29, 1878.

To all whom it may concern:

Be it known that I, DAVID H. HATLEE, of Clifton Park, in the county of Saratoga and State of New York, have invented a new and Improved Horseshoe Machine, of which the following is a specification:

Figure 1 is a plan view of my improved machine. Fig. 2 is a detail view of the shoe-clamping dogs. Fig. 3 is a detail view of one of the dies around which the shoe is formed. Fig. 4 is an inverted plan view. Fig. 5 is a vertical section taken on line *x x* in Fig. 1. Fig. 6 is a transverse section taken on line *y y* in Fig. 1. Fig. 7 is a detail sectional view taken on line *z z* in Fig. 1.

Similar letters of reference indicate corresponding parts.

My improved machine for manufacturing horseshoes has a horizontal bed, of which a portion is movable and carries dies, around which the shoe is formed (from a bar of suitable length) by means of devices attached to the fixed portion of the bed or frame of the machine, all of said devices being connected with and operated by the movable part of the bed, as hereinafter described.

In the drawing, A is the bed of the machine, which is supported on standards B, and is slotted through the center throughout its entire length and provided with tongues for guiding the movable bed C, which is shorter than the stationary bed A.

In the upper part of the standard B a shaft, D, is journaled, which projects beyond the standards at each side of the machine. Upon one end of the shaft D is placed a fly-wheel, E, and upon the other end there is a crank, F, that is connected by the connecting-rod G with an arm, H, that is secured to the end of a rock-shaft, I, that is journaled in the lower part of the standards B. Said rock-shaft carries a toothed sector, J, that engages a rack, K, on the under side of the movable bed C, and gives to the said movable bed a longitudinal reciprocating motion.

The bed C carries two dies, L M, around which the shoes are formed. The die L has a projection, *a*, which engages the middle portion of the bar from which the shoe is formed, and enters a recess in cap N when the latter is brought down. The bar from which the shoe-blank is formed is bent around the die L while cap N is held down, and the ends of the shoe-blank are upset and thickened vertically by lateral pressure applied by swinging benders or formers, as hereinafter described.

The cap N has an arm, *b*, which is pivoted in the end of the movable bed, and is curved downward and provided with a shoe, *c*, that engages a cross-bar, *d*, which is secured to the stationary bed A, so as to close the cap down upon the die at the proper instant and hold it in that position until the shoe-blank is bent and upset.

At the side of the stationary bed there are shears O, having the stationary blade *e* and the movable blade *f*, which is secured to the lever P, pivoted in ears *g* that project from the bed A.

The longer arm of lever P extends forward, and is engaged by a cam, Q, on the shaft D once during each revolution of the said shaft, and to the shorter arm of the said lever is attached a rod, *h*, that is connected with a spring, *i*, that is sufficiently strong to raise the upper shear-blade when the lever is not engaged by the cam Q.

A bar, R, which is secured to the bed A at right angles to the movable bed C and shear-lever P, has at its inner and outer ends a pair of ears, *j*, between which a dog, *k*, is pivoted, and upon the bar R, between the dogs *k*, a slide, S, is placed, which is also provided with ears *j* and with a dog, *k*.

The slide S is moved by a lever, T, which is pivoted to a bracket projecting from one of the standards B, and is moved by mechanism presently to be described.

The bar from which the shoes are formed passes between the ears *j* on the bar and on the slide and under the dogs *k*, and is moved forward through the shears and across the movable bed C by the slide S. The end of the bar is received in a groove in the vertical face of the gage U. The face of the said gage is cut away near the bed A to admit of the forward movement of the bar after it is dropped by the shears.

In the bed A four similar vertical shafts, *m*, are journaled. These shafts are arranged in pairs, the shafts of each pair being on oppo-

site sides of the movable bed C, and the pairs of shafts are placed apart a distance equal to the distance between the dies L M.

Under the movable bed C, and on opposite sides of the rack K, there are projections or teeth *n*, which engage the notches *o* in the inner ends of the levers V V′, which are secured to the lower ends of the shafts *m*. In the outer ends of the levers V V′ there are notches *p* to receive the nibs of the locking-levers W W′, which levers are pivoted to the bottom of the bed A. The plane ends of these levers in each pair adjoin each other and are moved outward by followers A′, that slide in grooves in the bed A.

The followers A′ have their inner ends beveled from each side toward the middle, and are received by notches *r* in the sides of the movable bed C when the levers W W′ do not lock the levers V V′, but are forced outward so as to lock the said levers V V′ twice during the stroke of the movable bed C by the projecting portions *q* at the sides of the notches *r*.

The arrangement of the respective pairs of locking-levers is such that the nibs of the first pair, W, leave the notches in the levers V as the nibs of levers W′ leave the notches in levers V′, as shown in Fig. 4. While the followers A′ are forced outward the levers W W′ temporarily lock the levers V V′, so that the two formers *s* are caused to act in the desired manner and succession.

The upper ends of the shafts *m* carry formers *s*, which carry the iron around the dies L M as the shafts *m* are oscillated. The formers *s* each have a curved surface that corresponds nearly to the form of the exterior of one-half of the shoe. To one of the shafts *m*, near the gage U, is attached an arm, *t*, that is connected by a rod, *u*, with the feed-operating arm T. Between the pairs of shafts *m* upon opposite sides of the movable bed there are holders B′, which receive the shoe-blank from the die L, and are provided with spring-dogs *v*, which retain the blank until it is engaged by the projecting portion of the die M.

Near the discharge end C′ of the machine there are holders B″ similar to the holders B′, which are provided with spring-dogs, which retain the finished shoe until another is brought forward to take its place.

Upon the center of the shaft D is placed a heavy arm, D′, having in its outer end sockets *a′* and clamping-screws *b′* for holding the creasing-dies *c′*, which form the creases in the bottom of the shoe.

The operation of my improved machine is as follows: The bar from which the shoes are to be made being already heated is placed between the ears *j* and under the dogs *k*, and even with the blade of the shears O. As the machine is operated by connection with any suitable motor the bar is moved forward until it touches the gage U, when the shears cut it, and it is received between the cap N and movable bed C and carried forward between the formers *s*, which, being turned in the manner already described, bend the bar around the die L, and at the same time upset or thicken it at the heel. The forward movement of the bed C carries the shoe to the holders B′, whose beveled edges raise it from the bed C. The shoe is carried to the middle of the holder by the projection *a* on the die L, when the bed returns and the operation just described is repeated. As the bed C makes a retrograde movement the die M is brought under the shoe contained by the holders B′, and the projection *w* of said die engages the inside of the toe of the shoe, and when the bed C again moves forward it carries the shoe under the guides *d′* attached to the holders B′ and under the creasers *c*. The arm D′ delivers the shoe finished to the holders B″, where it remains until it is discharged by the entrance of another shoe in the holders. When the cap N makes its return movement it is closed down upon the die L by an arm, *e′*, that is secured to the bed A and extends over the top of the movable bed C nearly to the holders B′.

In order that the shoe, when held by holders B′, may rise sufficiently to allow the die M to pass under it, as above stated, I construct the grooves in said holder of considerably greater width vertically than the thickness of the shoe.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the cap N, having the downwardly-curved arm *b* and die L, with the horizontally-movable bed C and the fixed cross-bar *a* of the bed A and the formers *s*, whereby as the movable bed advances the cap is brought down and held on the die by contact of said arm with the cross-bar, as shown and described.

2. The combination, in a horseshoe-machine, of the gage U, having the grooved face and cut-away side, with the shears O and benders or formers *s*, substantially as herein shown and described.

3. The combination of the bed C, having the teeth *n* and notches *r*, notched levers V V′, locking-levers W W′, followers A′, and the formers *s*, as herein shown and described.

4. The combination of the movable bed C, dies L M, formers *s*, holders B′ B″, and arm D′, carrying the creasing-dies *c′*, substantially as shown and described.

DAVID HENRY HATLEE.

Witnesses:

ABNER TORDOFF,

ABIJAH C. PECK.