(No Model.)

J. H. BICKLEY & J. H. BICKLEY, Jr.

MACHINE FOR MAKING CROW FEET.

No. 453,959. Patented June 9, 1891.

Fig. 1.

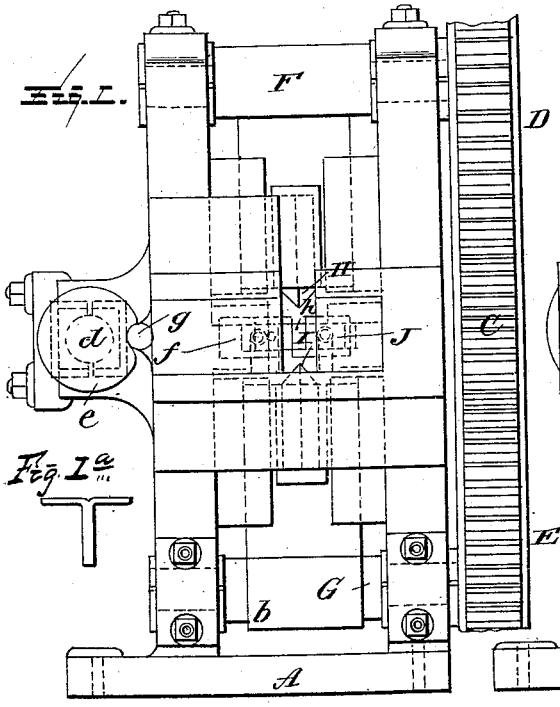


Fig. 1a.

Fig. 2.

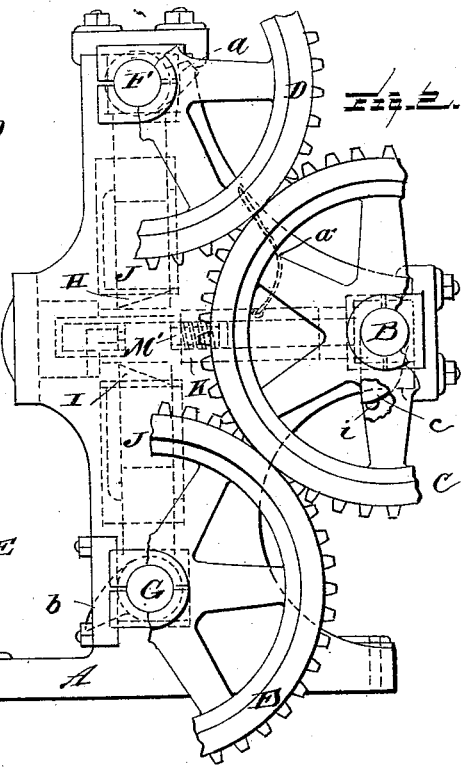
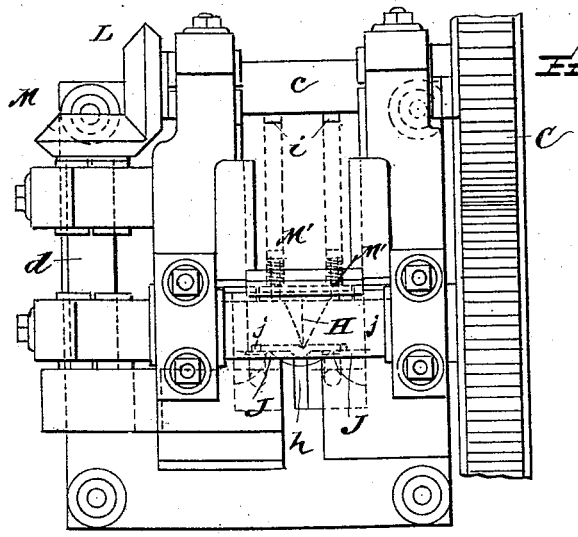


Fig. 3.



Witnesses
L. C. Hills.
E. A. Bond.

Inventors:
John H. Bickley and
John H. Bickley Jr.
E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

JOHN H. BICKLEY AND JOHN H. BICKLEY, JR., OF DOVER, NEW JERSEY.

MACHINE FOR MAKING CROW-FEET.

SPECIFICATION forming part of Letters Patent No. 453,959, dated June 9, 1891.

Application filed August 21, 1890. Serial No. 362,610. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. BICKLEY and JOHN H. BICKLEY, Jr., citizens of the United States, residing at Dover, in the county of Morris, State of New Jersey, have invented certain new and useful Improvements in Machines for Making Crow-Feet, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in machines for making crow-feet; and it has for its object, among others, to provide an improved machine for this purpose by which the crow-feet may be turned out at a rapid rate without much attention on the part of the operator. Provision is made for the punching of the articles after they are formed by the dies.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an end view of our machine. Fig. 1ª shows the product of the machine, which may be used for a variety of purposes, such as boiler-stays, supports, carriage-irons, and the like. Fig. 2 is a side view with portions broken away. Fig. 3 is a plan.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the framing, in which is suitably journaled the main shaft B, designed to be driven from any suitable source of power. (Not shown.) On this shaft is the gear-wheel C, which meshes with and imparts motion to the gears D and E upon the shafts F and G, one at the upper part and the other at the lower part of the machine, and arranged to be simultaneously operated in opposite directions by said gears. On the shafts F and G are cams *a* and *b*, as seen in Fig. 2 by dotted lines, which cams are designed to operate the wedge-shaped cutters H and I, which move in suitable guides in the frame-work and are beveled, as seen in Figs. 2 and 3.

J are molds or dies in the form of rectangular boxes with flanges *j*, which serve to limit the end spread of the split portions of the crow-feet and into which the split portions of the bar or blank are designed to be forced by the heading-die after the cutters have operated to split the said bar or blank.

K is the heading-die actuated by the cam *c* on the main shaft B, and is designed to work in suitable guides in the frame-work. It may be retracted, after it has done its work, in any suitable manner—for instance, by a spring *a'* secured to the frame and engaging a notch in said die, as seen in Fig. 2. The other end of the main shaft carries a miter-gear L, which meshes with a similar miter-gear M on the shaft *d*, which is journaled in suitable bearings on the framing and carries a cam *e*, as seen best in Fig. 1, designed to actuate the side grip *f*, which is provided with the anti-friction roller *g*, as also seen best in Fig. 1. The side grip carries one of the dies or forms J and is adapted to be actuated by the said cam *e*.

In operation the bar or blank of the required width and thickness is placed in the machine at *h*, which is the feed-opening, and is held from movement by the dies or forms J, while the cutters H and I are operated simultaneously in opposite directions to cut and spread the bar or blank into the shape of the letter Y, after which the cutters recede and the heading-die K moves and pushes the two wings into the forms or dies J, after which the heading-die recedes and the bar is then left in the shape shown at the left of Fig. 1. The machine with its cams are so timed as to each come into action at the proper time. This will be readily accomplished by those skilled in the art, being merely a matter of discretion or judgment on the part of the operators. Suitable means will of course be provided to insure the receding of the cutters and dies after they have performed their function. We have not chosen to show such means, as many different ways are known for accomplisaing this end. In order to punch the wings after they are formed or pressed out, we provide the spring-actuated punches M'. (Seen in Figs. 2 and 3.) They are of known construction and are arranged to move

in suitable guides in the machine. They are forced forward at the proper time by means of the lugs *i* on the cam *c*, as seen in Fig. 2. The completed article is removed by a wand in the usual manner, the dies being fitted so as to allow it to pass through.

Suitable outlets *k* are provided for the metal removed by the punches. (See Fig. 2.)

What we claim as new is—

1. The combination, with the reciprocating cutters, of the heading-die arranged to move at right angles to the cutters, and means for actuating said cutters and die, as set forth.

2. The combination, with the angular cutters and the heading-die arranged to move at right angles to the cutters, of means for actuating the cutters and die to first split the blank and then press the wings, as set forth.

3. The combination, with the cutters and the heading-die arranged to move at right angles to the cutters, of the side grip and the cam for actuating the same, as set forth.

4. The combination, with the cutters and the heading-die, of the side grip and the punches and means for operating the several parts, as set forth.

5. The combination, with the cutters, the heading-die arranged to move at right angles thereto, and the spring-punches, of the cams for operating the parts, and the lugs on the cam that operates the heading-die for actuating the punches, as set forth.

6. The combination, with the dies and the side grip, of the roller on the side grip and the cam for engaging said roller to actuate the side grip, as set forth.

7. The combination, with the angular cutters and means for moving them simultaneously in opposite directions, of the heading-die arranged to move at right angles to the cutters, the main shaft and gear-wheels, and the cams on the shafts for actuating the several parts, all substantially as specified.

8. The combination, with the cutters arranged to move simultaneously in opposite directions and the heading-die arranged to move at right angles to the cutters, of the main shaft, the cam thereon provided with lugs, the gear-wheel on the main shaft, the shafts F and G, the gears thereon, the cams on said shafts, the punches and the miter-gears and shaft provided with cam, and the side grip provided with anti-friction roller, all substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN H. BICKLEY.
JOHN H. BICKLEY, JR.

Witnesses:
RICHARD L. COOK,
PHILIP H. BURRELL.