3 Sheets—Sheet 1.

J. C. KLEIN & L. GERBER.

MACHINES FOR FORMING THE EYES OF PICKS.

No. 180,889. Patented Aug. 8, 1876.

Fig. 1.

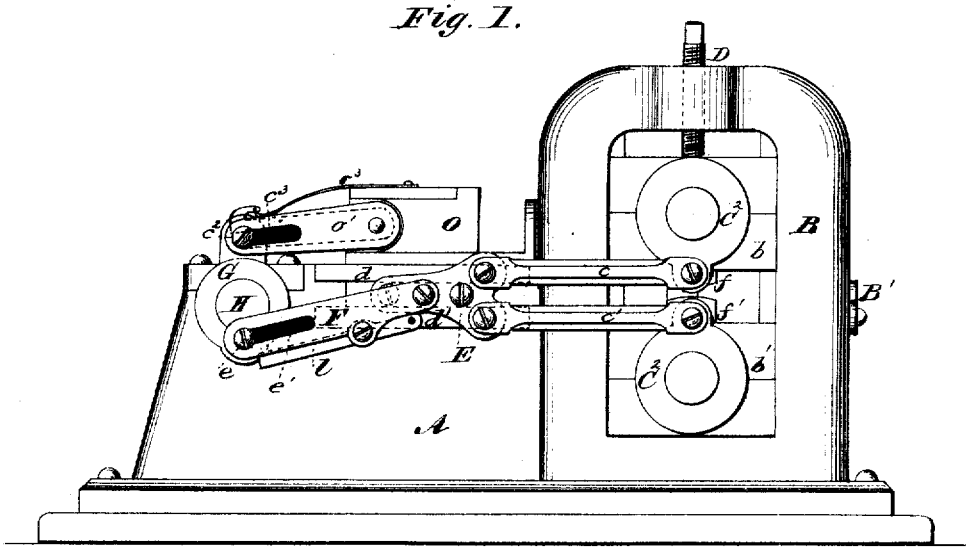
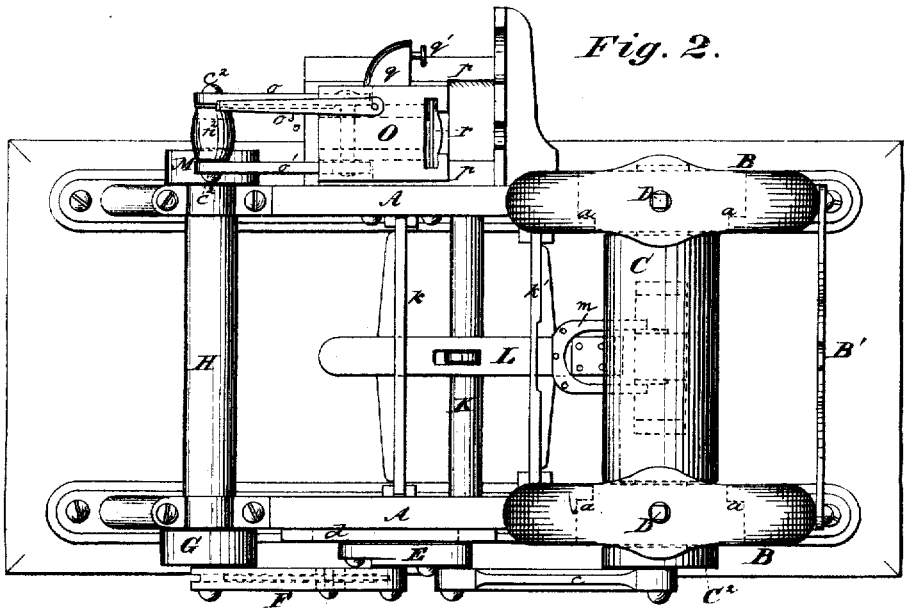


Fig. 2.



Witnesses:
Wm. P. Klein
Edw. P. Logan

Inventor:
John C. Klein,
Louis Gerber.

3 Sheets—Sheet 2.

J. C. KLEIN & L. GERBER.

MACHINES FOR FORMING THE EYES OF PICKS.

No. 180,889. Patented Aug. 8, 1876.

Fig. 3.

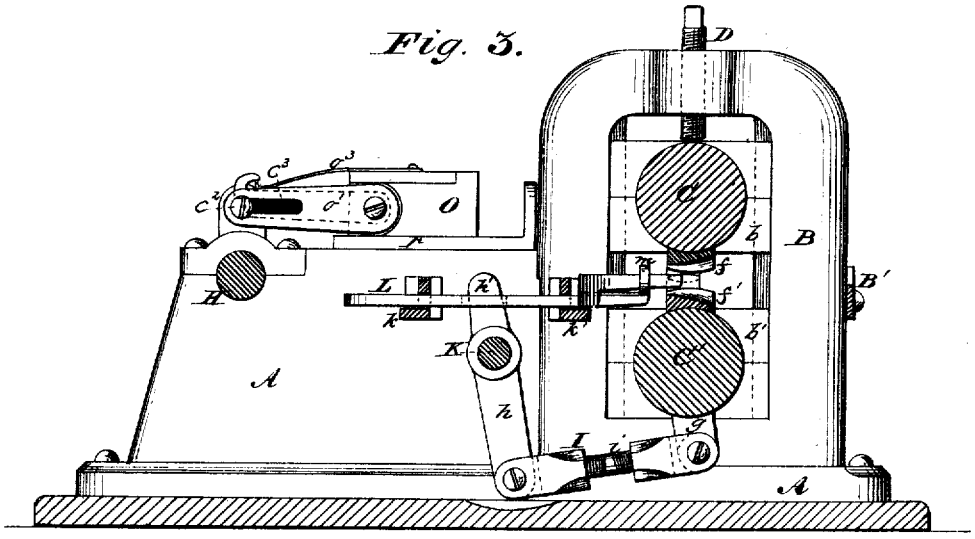
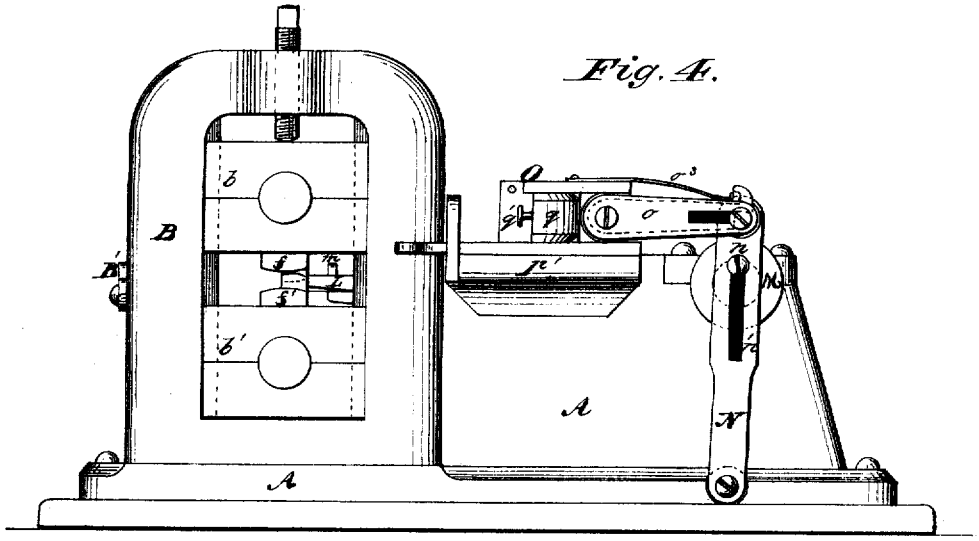


Fig. 4.



Witnesses:
Wm. B. Klein & Co.
E. P. Logan

Inventor:
John Chr. Klein.
Louis Gerber.

3 Sheets—Sheet 3.

J. C. KLEIN & L. GERBER.

MACHINES FOR FORMING THE EYES OF PICKS.

No. 180,889. Patented Aug. 8, 1876.

Fig. 5.

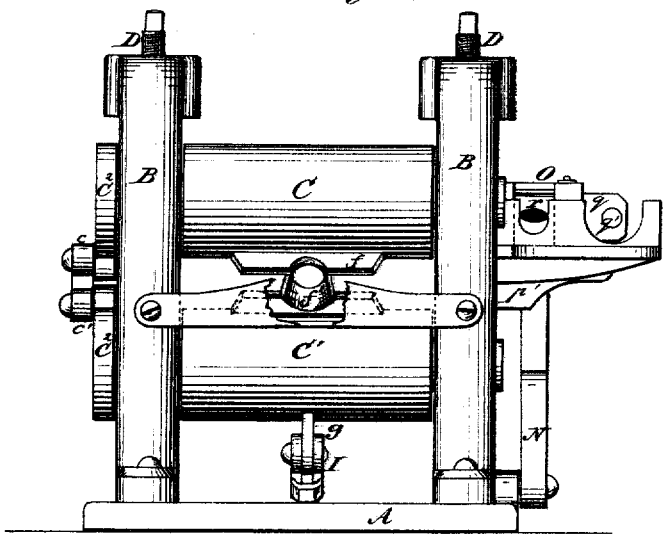


Fig. 6.

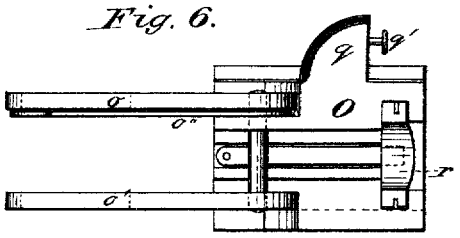


Fig. 7.

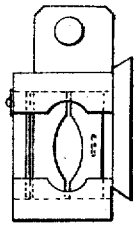


Fig. 12.

Fig. 8.

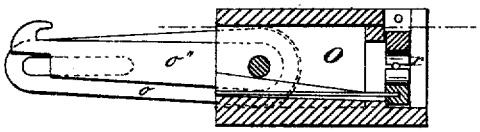


Fig. 9.

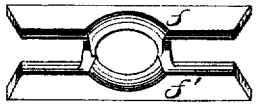


Fig. 10.

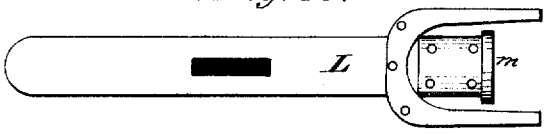


Fig. 11.

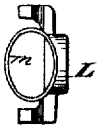
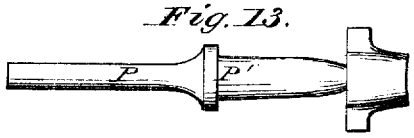


Fig. 13.



Witnesses:
Wm. B. Klein
Ed. P. Logan

Inventor:
John Chr. Klein
Louis Gerber

UNITED STATES PATENT OFFICE.

JOHN C. KLEIN AND LOUIS GERBER, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR FORMING THE EYES OF PICKS.

Specification forming part of Letters Patent No. **180,889**, dated August 8, 1876; application filed July 19, 1875.

To all whom it may concern:

Be it known that we, JOHN C. KLEIN and LOUIS GERBER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rolls for Forming the Eyes of Picks, &c.; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in machines for forming the eyes of picks and other similar tools; and it consists, first, in the combination, with the oscillating rolls provided with dies, of a rock-shaft, a lever, to which it gives motion, and a sliding rod, which presents the picks to the action of the dies; second, in the combination, with the driving-shaft, of a rocking lever attached to the crank of said shaft, and connected by connecting-rods with a reciprocating block, which forces the heated blank on the mandrel, by which it is presented to the action of the dies; third, in the combination, with the oscillating rolls, of connecting-rods attached to a vibrating cross-head, operated by a slotted connecting-rod attached to the crank of the driving-shaft, for the purpose of imparting an oscillating motion to the rolls; fourth, in the combination, with the sliding block which forces the blank on the mandrel, of the levers and crank for operating the same, and an auxiliary lever operated by a pin on the crank-lever, as more fully hereinafter set forth; fifth, in the combination of the sliding block, provided with dies and a proper support, and the mandrel, as more fully hereinafter set forth.

In the drawings, Figure 1 is a side elevation of a machine embodying our invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section on line *x x* of Fig. 2. Fig. 4 is a side elevation of the opposite side of the machine. Fig. 5 is a front elevation of the same. Figs. 6, 7, and 8 are detail views of the disengaging mechanism. Fig. 9 is a front view of the dies which are attached to the oscillating rolls. Figs. 10 and 11 are top and front views of the gaging mechanism. Fig. 12 is a blank, and Fig. 13 the mandrel.

Like letters indicate similar parts in all the figures.

We will now proceed to describe the invention, so that others skilled in the art may make and use the same.

In the drawings, A represents the bed or table for supporting the power-shafting, and provided at one end with housings B, in which are journaled the oscillating rolls or die-carriers C C^1. This housing is generally recessed or shouldered, as shown at *a*, into which the boxes *b b'* fit, and are adjusted by set-screws D. The oscillating rolls C C^1 are operated by link-rods *c* c^1, which connect with cranks C^2 on the ends of the rolls, and with a cross-head, E, that slides in suitable guides *d d'*. To the cross-head E is attached the connecting-rod F, which connects with a crank-pin, *e*, on the crank-disk G, secured to the outer end of shaft H, that is arranged in suitable journals in the bed-plate A. Any other equivalent gearing or mechanism may be employed to operate the rolls C C^1.

To the rolls are attached the dies *f f'*, by which the eyes of the picks, &c., are formed, and the upper one of said dies is provided with cheeks, that fit into recesses in the lower die, to prevent the spreading of the iron that forms fins. These dies approximate in form to the shape of the eyes of picks, &c., and are dovetailed to the oscillating rolls or carriers C C^1. Lateral dies, operated by suitable levers, may be used, in connection with the top and bottom dies, to form the eyes. To the lower side of the roll C^1 is attached an arm, *g*, which connects, by a rod, I, with forked ends, made adjustable by a screw, *i*, with an arm or lever, *h*, on the rock shaft K. This rock-shaft is journaled in the sides of the bed A, and the lever *h* projects above, as seen at *h'*, and engages with a sliding bar, L, that moves in guides *k k'*, secured to the bed A. The front end of said bar L is forked, and is provided with an open elliptical-shaped end, *m*, through which the end of the mandrel passes when presenting a blank to the rolls, and serves also as a gage for the length of the eyes, as its movement is regulated by the screw *i* of rod I. To the lower side of the connect-

ing-rod F is pivoted a notched lever, *l*, which is operated by a foot-lever, and, when thrown up, causes the movement of the rolls C C¹, which remain stationary, when the lever is released from contact with the crank-pin *e*, which then freely moves in a slot, *e'*, in the connecting-rod F, until the said lever *l* is thrown up again, and prevents the pin from moving backward and forward. To the shaft H on the opposite side of the machine is attached another crank, M, having a crank-pin, *n*, that moves in a slot, *n'*, in the rocking lever N, which is pivoted to the bed A. (See Fig. 4.) The upper end of lever N is provided with a boss, *n''*, to which the rods or levers *o o*¹ are connected by pins *c*², and operate the sliding block or cross-head O, that moves in suitable guides *p p*, supported on a bracket, *p'*, and attached to the side of the bed A. On the side of the block O is arranged a lug or projection, *q*, provided with a pin or stud, *q'*, with a head, against which the end of the mandrel for the eyes of picks, &c., is placed, and forced out of the eyes when moving forward. In the front end of the block O are inserted the dies *r r*, the lower one of which is kept up to its proper position by a spring, and the upper one falls by its own gravity. Between these dies the end of the mandrel P, having previously placed upon it a blank properly heated and punched, is held, and said blank is then forced onto the mandrel P by the forward movement of the block O, until it abuts against the collar of the mandrel.

The rear side of said collar bears against the support at the front end of the block O. The whole (mandrel and blank) is then presented to the rolls C C¹, with their dies, by which the blank is drawn out and finished to the shape of the eye, ready for welding on the points. To the side of the lever *o* is pivoted a notched lever, *o*², held in contact with pin *c*² by a spring, *o*³. This lever *o*², when thrown against the pin *c*², causes the block O to move backward and forward as long as it is kept in contact therewith; but, when released, the pin *c*² moves freely in a slot, *c*³, in the said lever *o*, and the block O remains stationary. At the front end of the housings is arranged a cross-bar, B', to serve as a rest for the operator when presenting the blank to the rolls. In presenting the blank to the dies a mandrel is used of the form shown in Fig. 13, and is constructed as follows: A rod or shaft, P, having an enlargement, P', at one end, and corresponding in form to the inside surface of the eye to be formed, is provided with a collar, which keeps the back part of the eye straight while the blank is passed through the rolls, and said collar also serves as a gage in forcing the blank on the mandrel. In stripping the article from the mandrel the ends of the blank are placed against the block O, and the pin *q'* of the block O, in its forward movement, pushes the mandrel out of the eye of the blank.

The operation is as follows: Motion is imparted through the power-shaft and connecting-rods to the oscillating rolls, and from them to the dies, at which time a blank, (shown in Fig. 12,) previously heated and forced on the mandrel P by the block O, is presented by the operator and seized by the dies, which, on their return movement, draw out, forge, and form the eyes, which are gaged by the bar L with end *m*, according to depth of eye required. The mandrel, with the blank, is then held against the pin *q'* of the block O, and by its forward movement it pushes the mandrel out of the eye of the article. The steel ends are then welded on, and the points finally drawn out, in the usual way.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination of the oscillating rolls C C¹, connecting-rod I, levers *h h'*, and sliding bar L, substantially as and for the object specified.

2. The combination of a shaft, H, crank M, rocking lever N, levers *o o*¹, and sliding block O, with pin *q'*, arranged and operating substantially as herein described.

3. The combination of oscillating rolls C C¹, connecting-rods *c c*¹, cross-head E, connecting-rod F, with pivoted lever *l*, pin *e*, crank G, and shaft H, substantially as shown, and for the purpose herein described.

4. The combination of sliding block O, slotted levers *o o*¹, with crank M, pins *c*², and pivoted lever *o''*, as and for the purpose described.

5. The combination of a sliding block, O, having pin *q'*, dies *r r*, and support *p'*, with a mandrel, P, as and for the purpose set forth.

In testimony that we claim the foregoing as our own we hereto affix our signatures in presence of two witnesses.

JOHN CHR. KLEIN.
LOUIS GERBER.

Witnesses:
WM. B. KLEIN,
ED. P. LOGAN.