

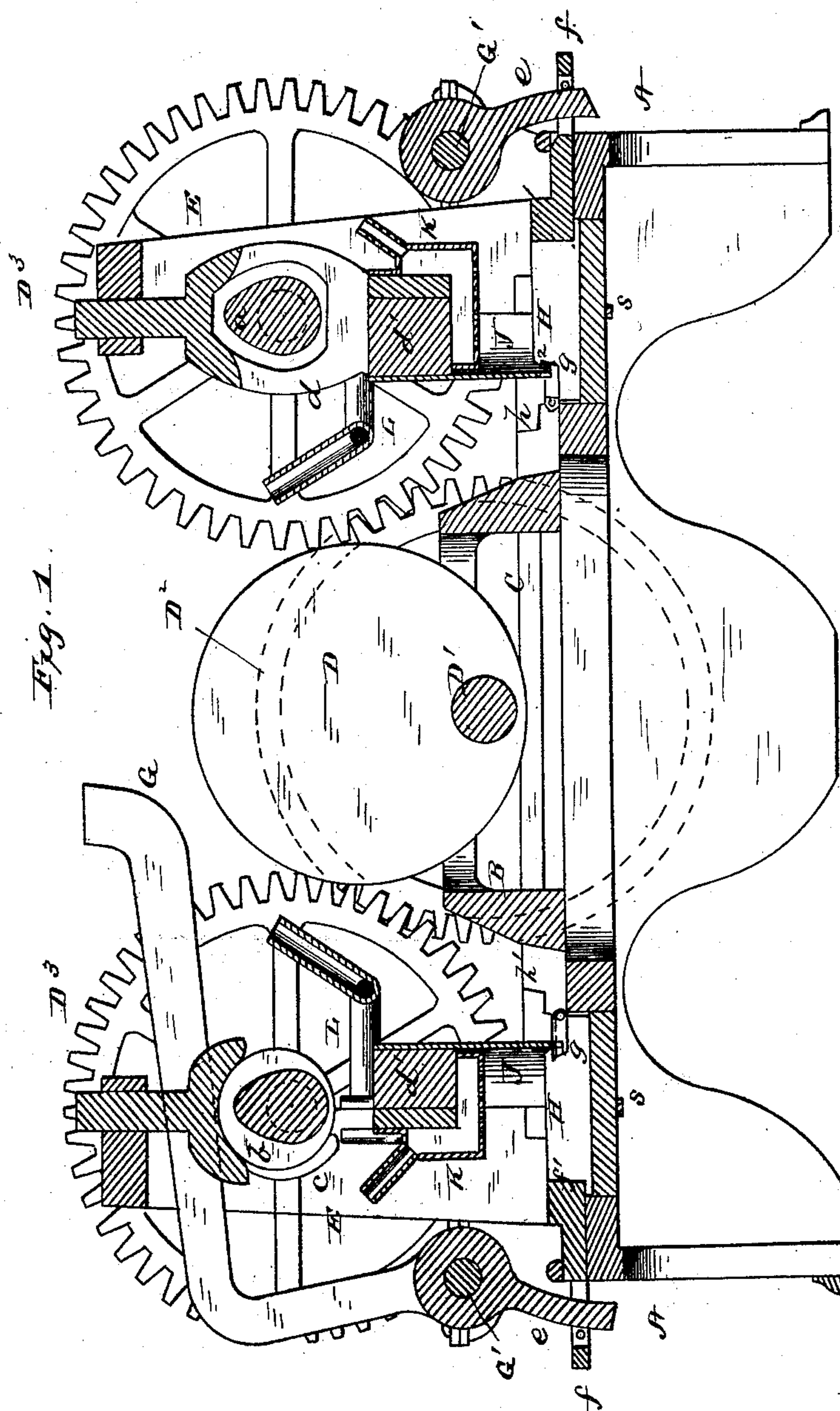
(Model.)

3 Sheets—Sheet 1.

Z. V. PURDY.
HORSESHOE MACHINE.

No. 257,450.

Patented May 2, 1882.



Witnesses.
Edwin L. Yerrice
J. J. M^{rs} Carthy:

Inventor:
Zachariah V. Purdy
By C. M. Alexander
his Attorney.

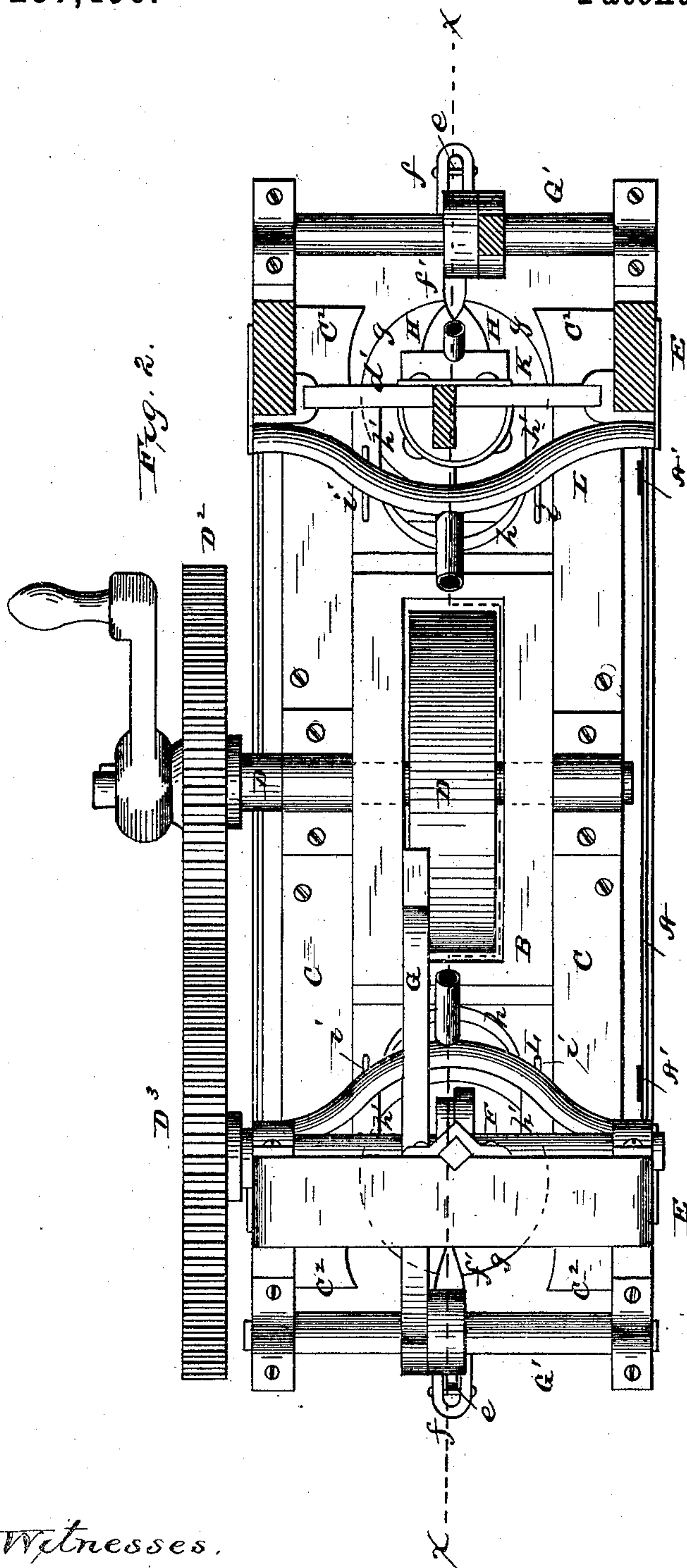
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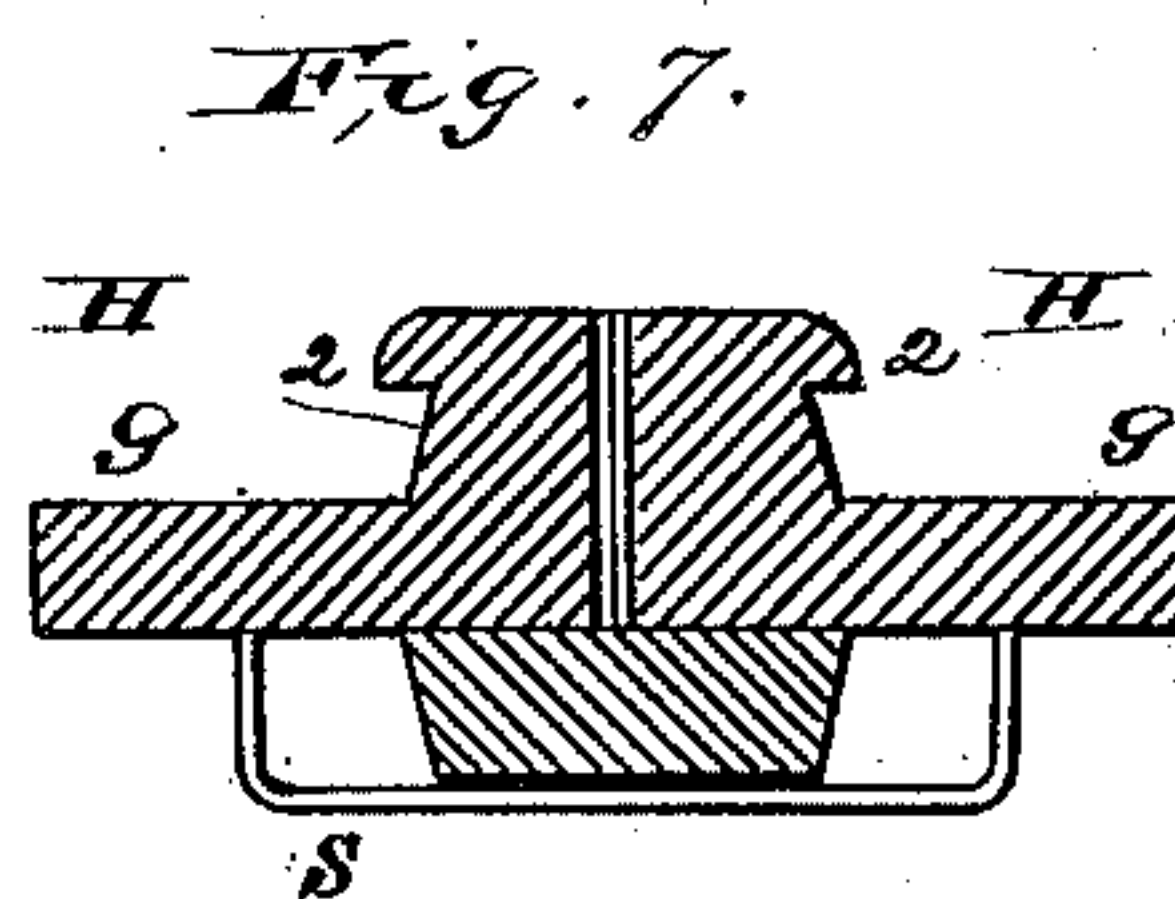
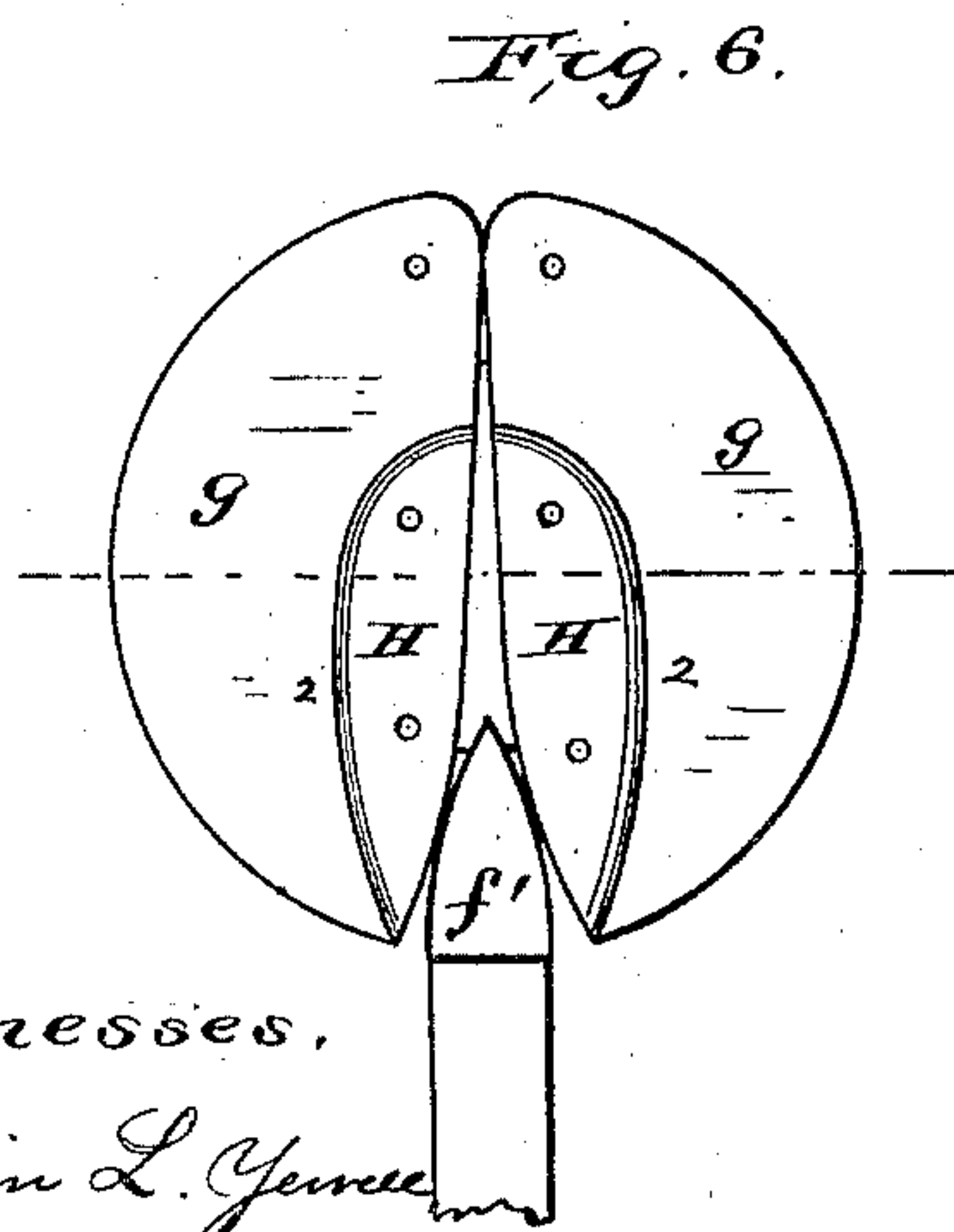
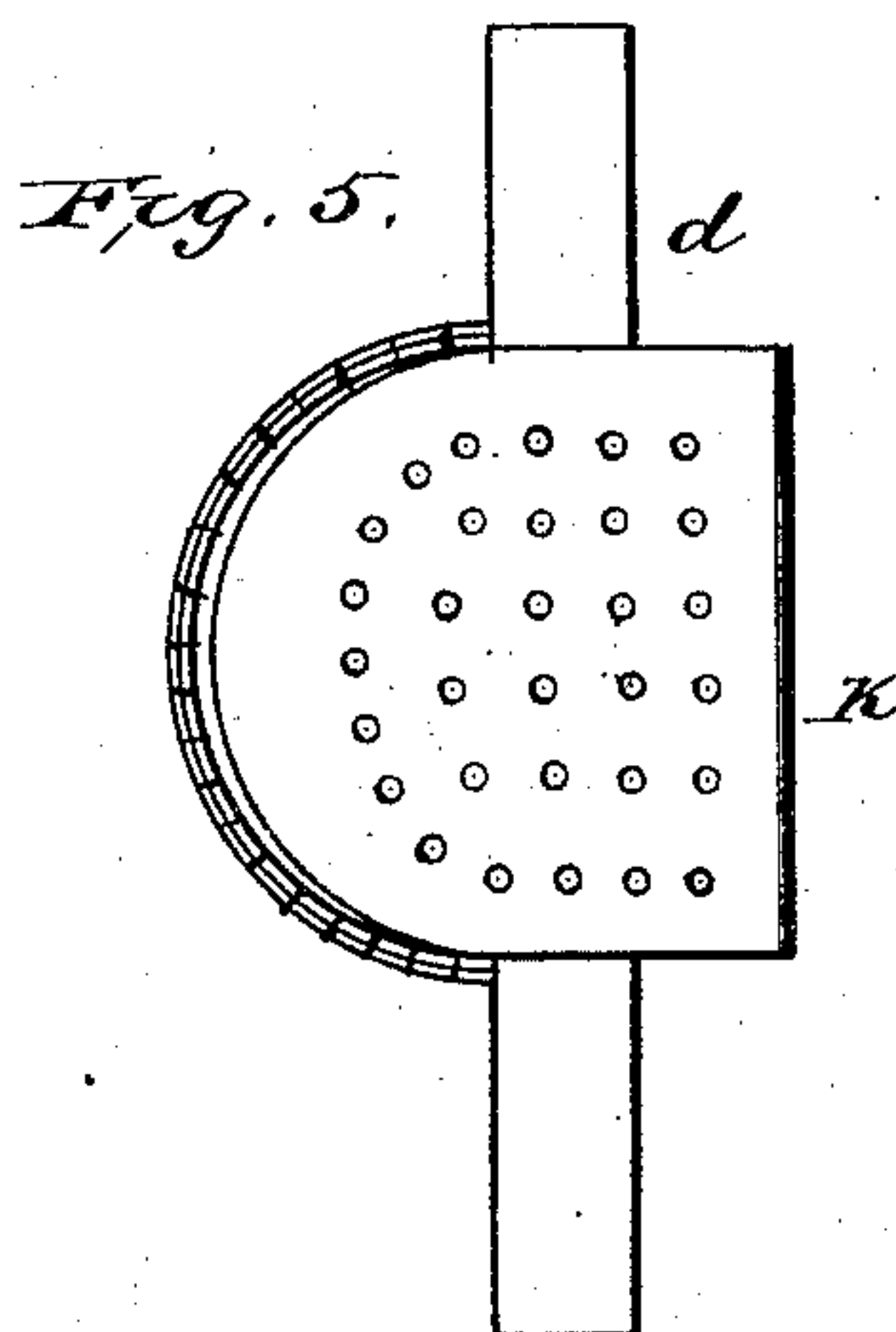
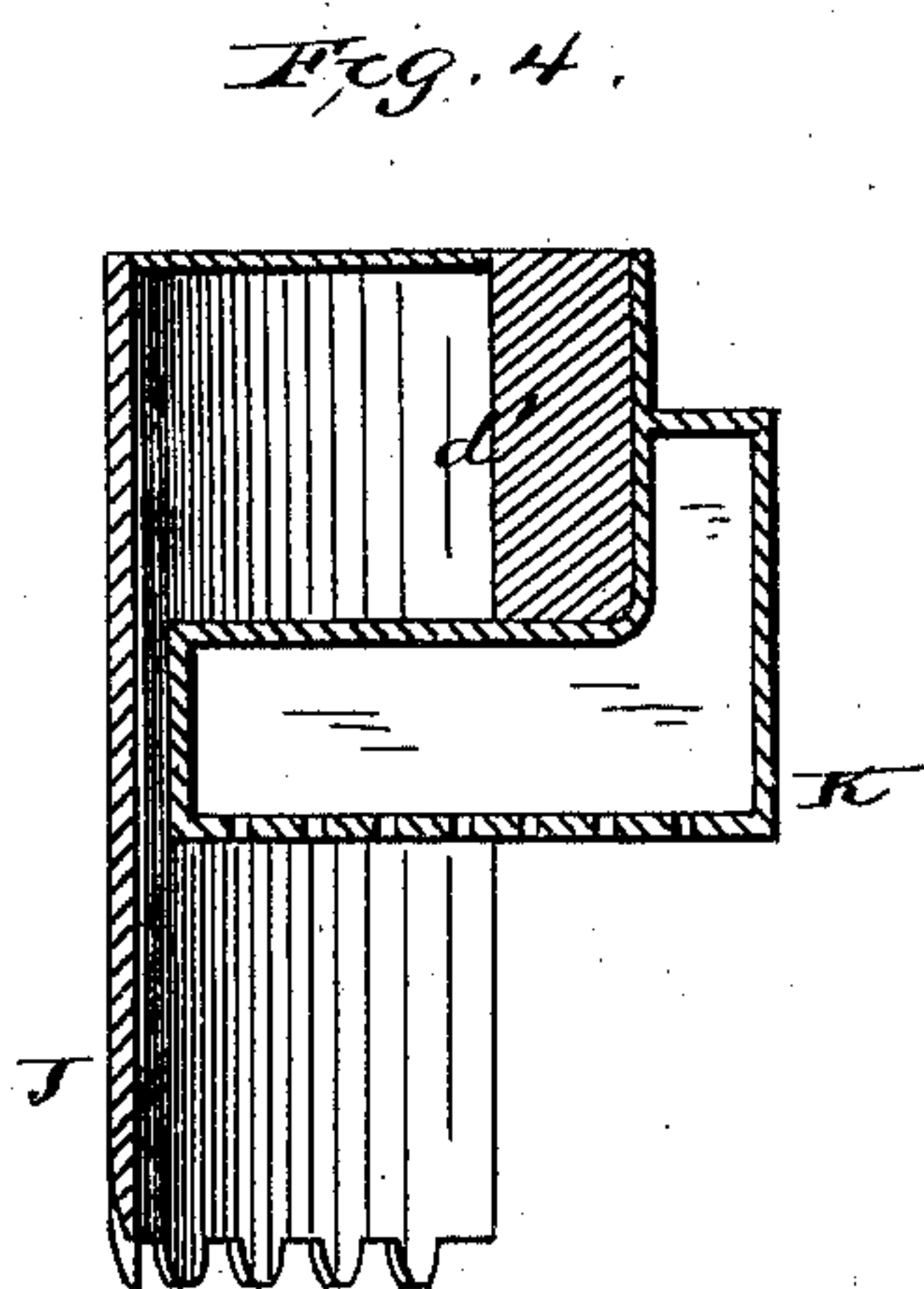
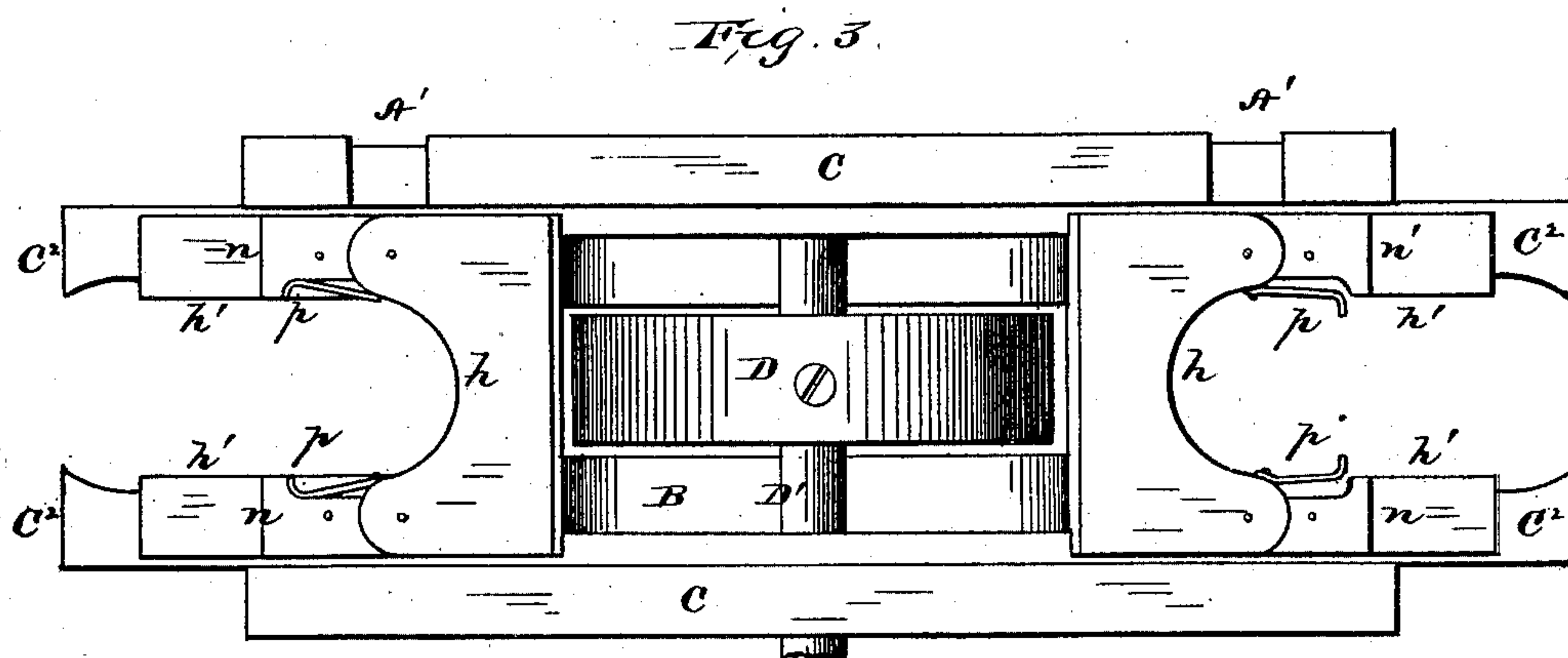
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Z. V. PURDY.
HORSESHOE MACHINE.

No. 257,450.

Patented May 2, 1882.



Witnesses.
Edwin L. Yence
J. J. McCarthy

Inventor.
Zachariah V. Purdy
By C. M. Alexander
his Attorney

UNITED STATES PATENT OFFICE.

ZACHARIAH V. PURDY, OF LOUISVILLE, KENTUCKY, ASSIGNOR OF ONE-HALF TO ALBERT G. GLOVER, OF SAME PLACE.

HORSESHOE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 257,450, dated May 2, 1882.

Application filed February 3, 1882. (Model.)

To all whom it may concern:

Be it known that I, ZACHARIAH V. PURDY, of Louisville, in the county of Jefferson, and in the State of Kentucky, have invented certain new and useful Improvements in Horse-shoe-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to improvements on machines which are constructed for making horseshoe-blanks and punching the nail-holes at a single operation; and the nature of my invention and improvements consists in the combination of a reciprocating carriage, a concave bending-head, spring-actuated bending-jaws, cams for compressing these jaws, expandible dies or formers, and discharging-hooks, all arranged and operating as will be hereinafter explained, whereby a straight rod of iron properly heated is bent in the form of a horseshoe and discharged from the machine.

The invention also consists in the employment, in combination with the above devices, of a segment-shaped tool which will make the nail-holes through the blanks and crease them while they are held between the bending-head, its jaws, and the expanded dies, as will be hereinafter explained.

The invention further consists in the combination, with the bending devices and dies, of means for throwing a spray of water on the blanks and the devices for producing them, and means for throwing strong currents of air on said benders, dies, and blanks for blowing away iron-scales and steam, as will be hereinafter explained.

In the annexed drawings, Figure 1 is a section taken vertically and longitudinally through a machine designed for making shoe-blanks at both ends, the plane of this section being indicated by dotted line *x x*, Fig. 2. Fig. 2 is a top view of the machine and a horizontal section through one end thereof. Fig. 3 is a bottom view of the benders, their carriage and guides, the discharging spring-hooks, and the feed-holes, cut-off, and carrying-shoulders. Fig. 4 is a vertical section through the seg-

ment-shaped piercing device, the cross-head, and the water-spray box detached from the machine. Fig. 5 is a bottom view of said devices. Fig. 6 is a top view of the expandible die-sections and their expanding-wedge therefor. Fig. 7 is a vertical transverse section through Fig. 6.

Similar letters of reference indicate corresponding parts in the several figures.

A designates a solid frame, on which the working parts of two machines for making shoe-blanks are mounted. I prefer to construct the machines in this manner, so that two men can work at one frame and a perfect shoe can be formed and discharged from the machine. I do not, however, confine my invention to duplicating the shoe-forming mechanism on one frame. I will therefore only refer to one mechanism, it being understood that I may use two, if desired.

B designates a rectilinear reciprocating carriage, which moves between guides *C C'*, and which receives motion from a cam, *D*, on the main driving-shaft *D'*, on which shaft is keyed a large spur-wheel, *D²*.

E E designate standards, which are erected on frame *A*, near one end of it, and connected together at their upper ends by a cross-bar.

F is a horizontal transverse shaft, having its bearings in standards *E*, on which shaft is keyed a spur-wheel, *D³*, which engages with the wheel *D²*, and thus receives rotation from the main shaft. On shaft *F* three cams, *a b c*, are keyed. The cams *a b* act on a yoke, *d*, connected to a cross-head, *d'*, and give vertical motion thereto. The upper end of said yoke has a square extension, which is guided by the cross-bar of standards *E*, and the cross-head *d'* moves in guides secured to said standards. The cam *c* lifts at every revolution a curved gravitating arm, *G*, which is keyed to a rock-shaft, *G'*, supported by brackets on the standards *E*. To this rock-shaft is keyed a curved double-throw arm, *e*, which passes freely through the slotted end of a slide, *f*, on the inner end of which a wedge, *f'*, is formed.

H H are two half-dies, corresponding in shape and size to the shape and size of the interior edge of the shoe-blank which it is desired to make. These dies are secured to or formed on

semicircular plates $g g$, which are applied in a recess in the top of table A, so that their surfaces are level with this table-top. Plates $g g$ are connected to the frame A by vertical pivots, so that the heel ends of the dies can be spread apart by forcing the wedge f' between them, which operation takes place at every upward throw of the gravitating arm G. The outer edges of the dies H H are beveled to give the proper bevel to the inner edges of the shoe-blank, and the overreaching shoulders 2 on the edges of the dies hold the shoe-iron down in its place during the bending and piercing operations, hereinafter described.

Beneath the die-plates $g g$ is a spring, s , which contracts or brings these plates and their dies together when the wedge f' is retracted and frees the shoe-blank from them. The carriage B has formed on or suitably secured to it a concave bender, h , corresponding in shape and size to the front part of the shoe-blank which it is desired to produce, and to the ends of this bender h two bending-jaws, $h' h'$, are suitably pivoted, which are held down in their places by means of the guides C C' and extensions C² C² of these guides. The jaws $h' h'$ are held apart by means of springs $i i$, and they are caused to press the shoe-iron about the sides of the dies H H by means of the curved inner edges of the guide-extensions C² C².

Portions of the under sides of the bending-jaws $h' h'$ are cut away, so as to leave shoulders $n n'$ of a vertical depth which is equal to the thickness of the shoe-rod, and other portions of these jaws $h' h'$ are cut away to receive the free ends of two hooked springs, $p p$, which are secured to the inner edge of the benders h' . (Shown in Fig. 3.) These spring-hooks $p p$ are so arranged that they retire into their recesses during the bending operation, and at the completion thereof they spring out behind the heels of the finished blank and cause its discharge from the machine through an opening in table A when the carriage B is moved back by its cam. This carriage B is moved back far enough to allow a shoe-rod (properly heated) to be passed through an opening, A', and upon the table-top in front of the shoulders $n n'$, which carry the rod forward to be bent.

J designates a piercing-tool, which is rigidly secured to the cross-head d' , and which in horizontal section is the form of the segment of a cylinder. The lower edge of this tool is provided with beveled teeth, and the gullets between the teeth are also beveled, as shown in Figs. 4 and 5. By means of this tool the nail-holes are pierced through (not punched) the shoe at the moment the bending devices cease their work. This tool also creases or "fulls" the shoe while it is confined.

K designates a water-spray box applied to the cross-head d' , provided with a finely-perforated bottom, and also with a tube, by means of which latter and a hose the box can be flexibly connected to any convenient water-reservoir.

L designates a pipe which has perforations through its lower side, and which is secured to the standards E near the bending devices. This pipe is provided with a branch that leads to any suitable "blower" or air-forcing engine.

It is very important to cool the dies and benders and the shoe-blanks, and also to free said parts from iron scales which fall from the shoe-rods during the bending and piercing processes. This I do by injecting a fine spray of water on the parts and by blowing away the scales by the means described. The air-currents will also blow away the steam generated by spraying the heated parts.

It is proper to state that the outer angle of the shoulder n' on the bending-jaw next the feed-opening A' operates to cut a proper length from the shoe-rod to form a shoe.

Having described my invention, I claim as new—

1. The combination of the reciprocating carriage B, the bender h on this carriage, the spring-actuated jaws pivoted to the bender, having the shoulders $n n'$, the feed-opening A' through the guide C', the hooked-spring dischargers, the collapsible die, and the curved extensions C², which compress the said jaws, substantially as described.

2. The spring-actuated collapsible dies H H', beveled and shouldered, as described, in combination with the opening-wedge f' and means for actuating this wedge, substantially as described.

3. The vertically-reciprocating segment-shaped piercing-tool J, having beveled teeth and beveled gullets formed on it, means for bending rods into horseshoes, and the sprinkling-box K, all applied to a vertically-movable head, d' , substantially as described.

4. The combination, in a horseshoe-machine, of a right-line reciprocating carriage, a cam giving positive movements thereto, a concave bender secured to the carriage, bending-jaws pivoted to the concave bender, guides for the carriage and bending-jaws, spring discharging-hooks, bending-dies which are expansible, a nail-hole-piercing tool, and means for supplying air and water jets, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 20th day of January, 1882.

ZACHARIAH V. PURDY.

Witnesses:

J. SPEED PEAY,
THOS. M. FLETCHER.