

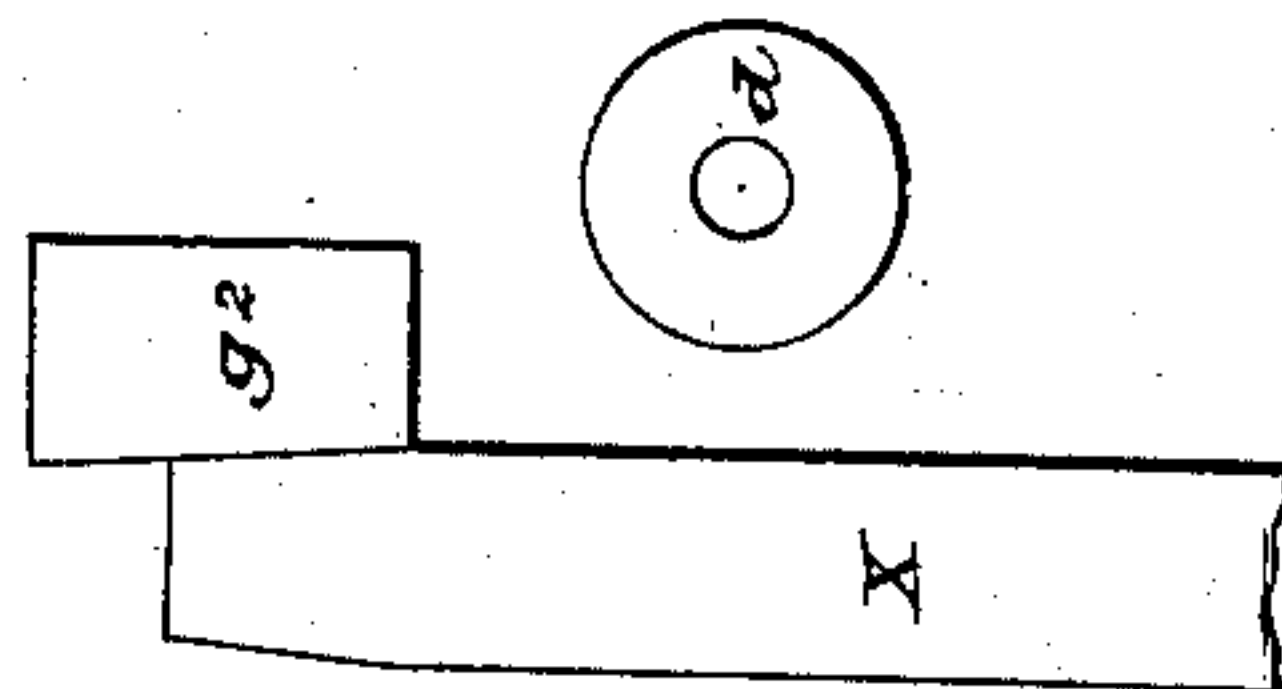
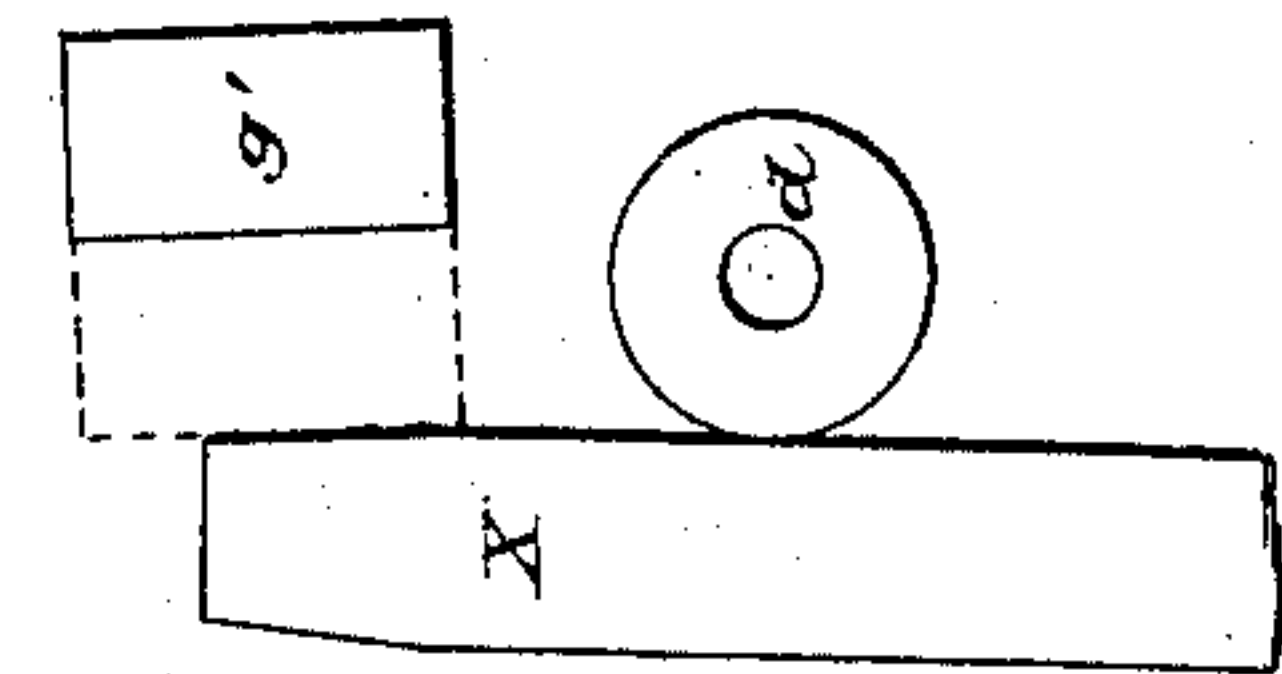
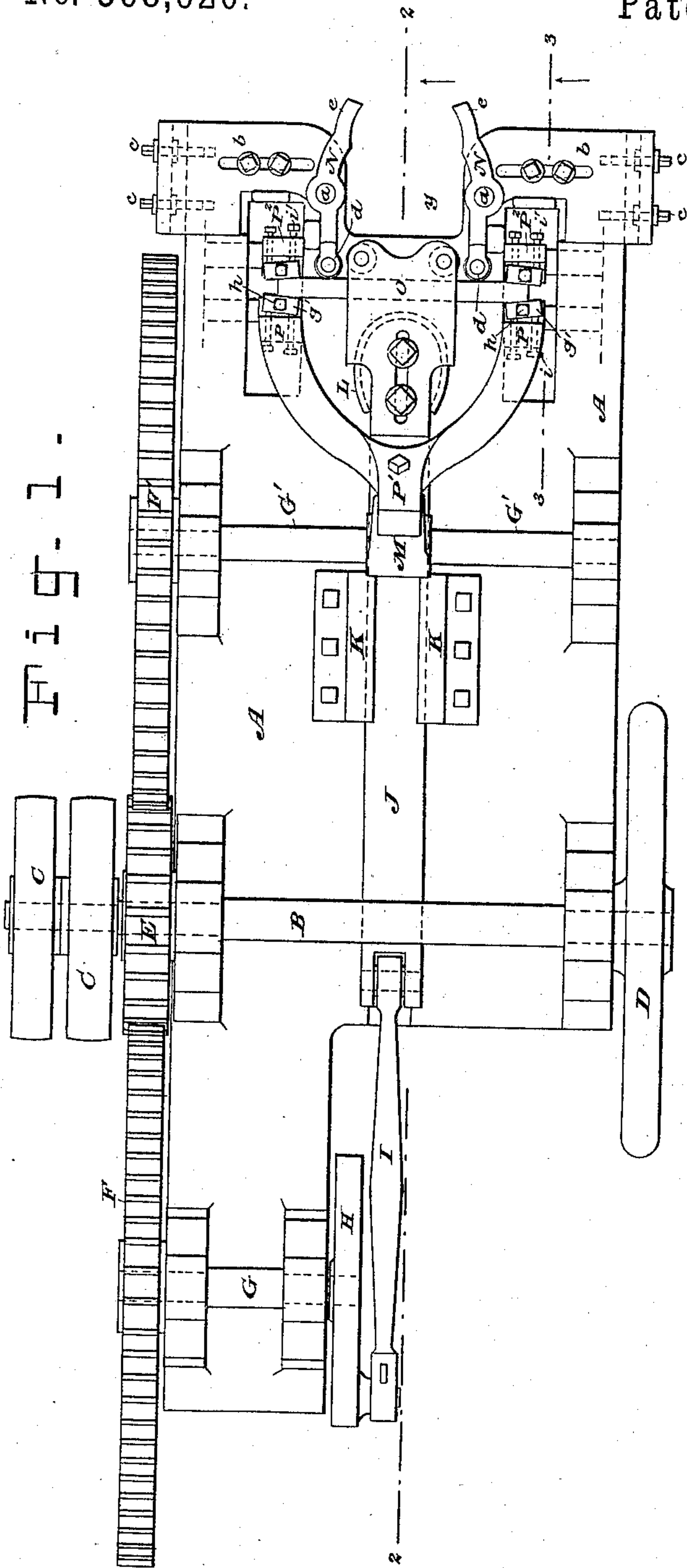
(No Model.)

2 Sheets—Sheet 1.

J. RUSSELL.
HORSESHOE MACHINE.

No. 368,620.

Patented Aug. 23, 1887.



WITNESSES:

E. B. Bolton
W. B. Barlingham

INVENTOR:

Jacob Russell

By his Attorney,

Henry Connel

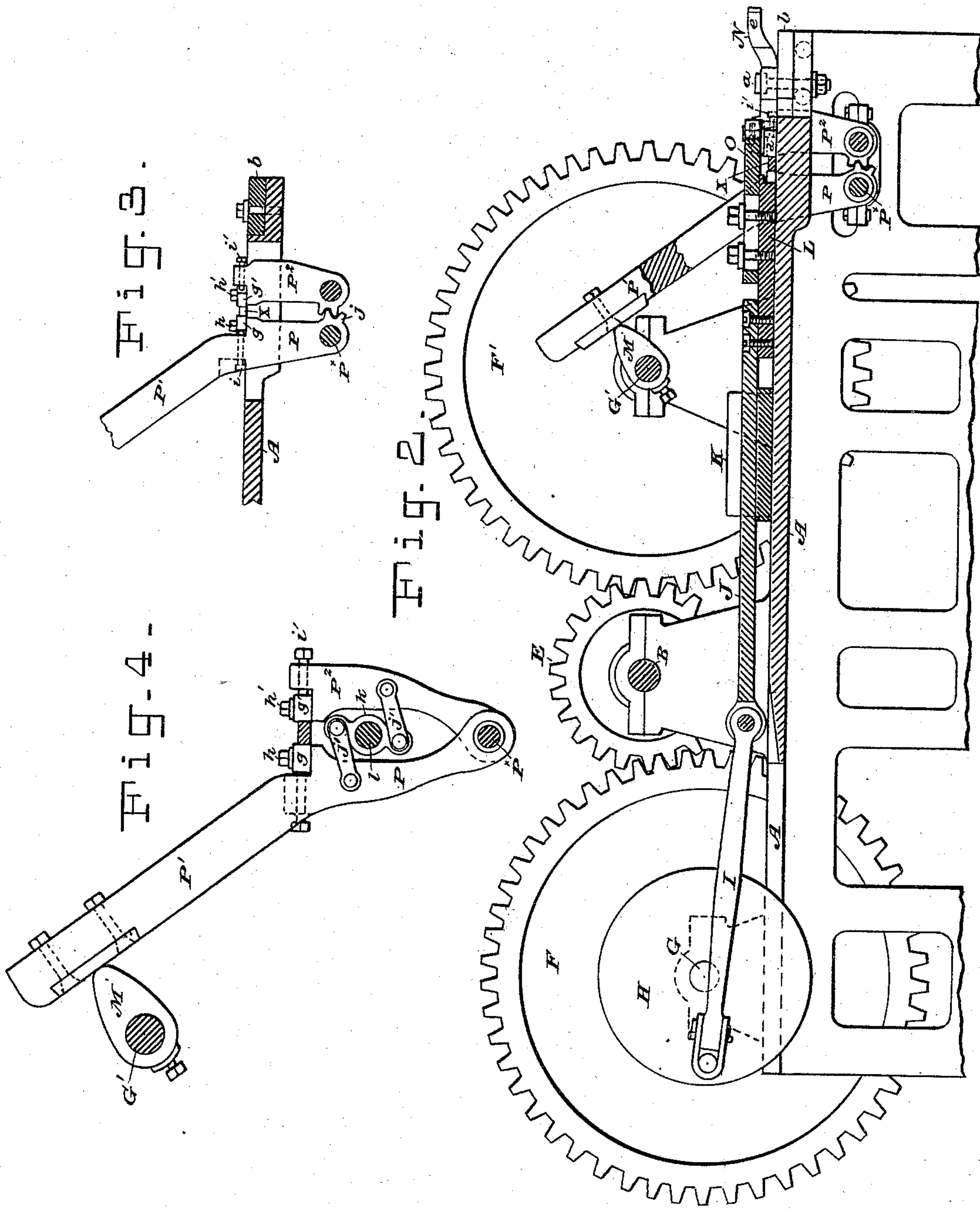
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UNITED STATES PATENT OFFICE.

JACOB RUSSELL, OF BROOKLYN, NEW YORK.

HORSESHOE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 368,620, dated August 23, 1887.

Application filed November 26, 1886. Serial No. 219,911. (No model.)

To all whom it may concern:

Be it known that I, JACOB RUSSELL, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented certain Improvements in Machines for Bending Horseshoes, of which the following is a specification.

My invention relates to that general class of machines wherein the shoe-blank is placed in the machine, and the latter automatically "squeezes" the heels—that is, the ends of the blank which ultimately form the heels of the shoe—and then bends the blank to the proper shape around a "former" or bender.

The principal object of my invention is to provide a squeezing mechanism for the ends of the blank, wherein both of the squeezing-jaws of each pair move inward upon the blank and outward from the same in unison, instead of employing one fixed and one movable jaw in each pair, as in the ordinary construction of such machines. The purpose of this improved construction and arrangement of the jaws will be hereinafter fully set forth.

My invention will be hereinafter described, and its novel features carefully defined in the claims.

In the drawings, which serve to illustrate my invention, Figure 1 is a plan of the machine, and Fig. 2 is a longitudinal vertical mid-section of the same on line 2 2 in Fig. 1. Fig. 3 is a detached side elevation of the squeezing-jaws, the machine-bed being in section on line 3 3 in Fig. 1. Fig. 4 illustrates a modification of the squeezing-jaws. Figs. 5 and 6 are views in the nature of comparative diagrams, designed to illustrate the squeezing and bending mechanism as commonly constructed and arranged and my improved squeezing and bending mechanism.

Let A represent the machine-bed, usually an iron table with a suitable supporting-frame. On this table is rotatively mounted the main shaft B, carrying tight and loose pulleys C, a fly-wheel, D, and a driving-pinion, E. F F' are spur-wheels, carried, respectively, by shafts G G' and meshing with pinion E, as shown. The shaft G carries a crank or a crank-wheel, H, to which is coupled a connecting-rod, I, the other end of said rod being coupled to a slide, J, which plays in guides K longitudinally of the bed A. The slide J carries

on its front end the former or bender L, which has the contour of a horseshoe. The shaft G' carries a cam or toe, M, which imparts motion to the squeezing-jaws.

NN are levers pivoted at *a a* on slide-plates *b b*, mounted in guides on the machine-bed, and provided with adjusting-screws *c c*, whereby they may be set in or out. On the inner ends of the levers N are mounted rollers *d*, which are usually called "bending-rollers," as the blank is forced against them by the former or bender L when it advances, and they form rolling abutments over which the blank is bent. These rollers are also thrown toward the former L at the proper time to press in the heels of the shoe and change its shape from a U form to a horseshoe form. To effect this lateral movement of the bending-rollers a spreader, O, is adjustably mounted on the former L, and the advancing end of this spreader enters at the proper point in its movement between the cam-like ends *e e* of levers N, thus spreading them and throwing inward the other ends of said levers carrying rollers *d d*.

I will now describe the mechanism I employ for squeezing the heels, premising that it is a well-known practice in the art of making horseshoes by machinery to compress or swage the ends of the blank, so as to taper the same laterally and thicken them vertically. This is ordinarily effected by placing the blank while hot against fixed dies and applying to its opposite edge movable dies, the dies having the proper bevel or inclination to produce the taper required. I effect it in my machine by means of moving dies which move up simultaneously from opposite sides and squeeze or pinch the blank and then fall back without moving the blank from its position. There is a pair of squeezing-jaws and their dies for each end of the blank; but they are alike and so connected as to operate simultaneously on the blank.

P P are two squeezing-jaws cast in one with or fixed on a rock-shaft P^x, which has bearings in the machine-frame. These jaws are connected by an arched frame, P', which rests against the cam M. The jaws P are provided with steel swaging-dies *g g*, each secured to its jaw by a screw or pin, *h*, and provided with adjusting-screws *i*, whereby the inclination of

the operating-face of the die may be varied by causing the die to turn on its central attaching-screw, *h*. The opposite squeezing-jaws, P^2 , of the pairs are precisely like the jaws P , are mounted in the same way, and provided with like adjustable dies $g' g'$. In the construction shown, P are the jaws to which the power is directly applied, and these jaws may communicate their movement to jaws P^2 in various ways.

In Figs. 2 and 3 I have shown the jaws P and P^2 provided with intermeshing teeth j , in the manner of segments of gear-wheels. In Fig. 4 I have shown the opposite jaws of the pair coupled by links j' to the opposite arms of a boss, k , on a rock-shaft, l . The operation of these devices for compelling the jaws to move in unison will be obvious on inspection.

The operation of the machine is as follows: The attendant places a shoe-blank, X , in the machine, when the squeezing-jaws $P P^2$ are open and the former L is drawn back, care being taken to place the blank against the bending-rollers $d d$. The shafts G and G' making synchronous revolutions and the crank H being set properly with reference to the cam M , the said cam acts on the squeezing-jaws $P P^2$ and closes their dies on the blank, thus squeezing its ends without moving it out of its position. As the cam M moves on and from under it the weight of frame P' causes it to fall back and throw open the dies $g g'$, leaving the blank X lying precisely where it was originally placed, and in contact with the rollers $d d$. The former L now advances and bends the blank into a U shape, carrying the partially-bent blank with it. When the advancing end of the spreader O enters between the cam-like ends e of levers N , the rollers d bend in the ends of the blank and give to it the proper horseshoe shape. When the former has reached the end of its stroke, the shoe will drop off and fall through the opening y in the machine-bed.

One advantage of my invention is that the blank is never disturbed from the time it is placed in the machine until the former strikes it and bends it on the rollers d in the manner described.

Fig. 6 shows the blank X in position against the bending-rollers d . The back die, g' , of the squeezing-jaws moves up to the position indicated in dotted lines and then moves back to the position shown in full lines. The front die, g , (not seen in this figure,) moves up and falls back simultaneously with die g' . The relative positions of roller d and the dies $g g'$ permits of the squeezing being effected while the blank lies in contact with the roller d .

Fig. 5 illustrates the ordinary method and construction where the back die, g' , is fixed. In this construction the front die must move the blank along the table-bed far enough to produce the back bevel in squeezing, and this is almost certain to shift the blank endwise, especially if it is not heated evenly and one end is softer than the other, and the position

of the bending-roller d , which is usually an inch or two from the blank when the bender strikes the latter, is liable also to produce an endwise movement of the bar, and always produces a false bend in the blank at the angle of the fixed die, which bend is difficult to remove. Of course the shifting of the blank endwise spoils the shoe.

My mode of mounting the die g on the squeezer-jaw obviates the necessity of shifting the dies outwardly and inwardly to suit blanks of different lengths. I simply vary the bevel of the face of the die by means of the two screws i behind it. For a short blank the bevel is made steeper than for a long blank. The levers N may be set in or out, to suit the size of shoe. The former L and spreader O will be changed for shoes of different sizes. When standing in their normal positions, the levers $N N$ rest against stops on the table-bed, and after the ends of same which bear the rollers d have been thrown in by the spreader and the spreader has been retracted the levers are drawn back or outward to their stops by some simple device, usually cords and weights. This forms no part of my invention, and I have not deemed it necessary to show it.

I find it convenient to connect the jaws $P P$ by a frame, P' , and to employ but one cam M ; but it is obvious that each jaw P might be operated independently by a cam, both cams, however, acting simultaneously on their respective jaws.

Having thus described my invention, I claim—

1. A machine for squeezing simultaneously the two ends of a horseshoe-blank, comprising two pairs of movable jaws, and means for moving both jaws of each pair simultaneously toward and from each other.

2. A machine for squeezing simultaneously the two ends of a horseshoe-blank, comprising two pairs of movable jaws provided with adjustable dies, and means, substantially as described, for moving both jaws of each pair simultaneously toward and from each other.

3. The combination, with the bending-rollers of a horseshoe-machine against which the blank is placed, of the pairs of movable squeezing jaws and dies arranged with respect to the bending-rollers, as described, and means for actuating said jaws and dies, whereby the latter are adapted to squeeze both ends of the blank simultaneously without disturbing it.

4. The combination of the jaws $P P$ and P^2 , provided, respectively, with dies and with intermeshing teeth j , whereby one jaw of the pair is made to impart its motion to the other, and the cam M and its shaft.

5. The combination of the jaws $P P$ and P^2 , mounted to rock on suitable bearings and provided with dies, means for coupling together the jaws of each pair, whereby one is made to impart its motion to the other, and means for actuating said jaws.

6. The combination, with the reciprocating bender or former of a horseshoe-machine and

the mechanism for actuating it, of two pairs of movable dies for squeezing the ends of the blank, and mechanism for actuating said dies, the two mechanisms being timed to effect the 5 operations of squeezing and bending the blank successively, substantially as described.

7. The squeezing-jaw provided with a die, *g*, attached by a single screw or pin, *h*, and with two adjusting-screws, *i i*, whereby the bevel or 10 inclination of the working-face of the die is varied.

8. The combination, with the former L, of the spreader O, provided with rollers and

mounted adjustably on the former, and the two levers N N, pivoted on the machine-bed at *a a*, 15 and provided with bending-rollers *d d* at one end and cam-like faces *e e* at their other ends, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing 20 witnesses.

JACOB RUSSELL.

Witnesses:

HENRY CONNETT,
T. D. COPLINGER.