No. 622,493. Patented Apr. 4, 1899.

O. KNIEP.

MACHINE FOR MAKING HEEL CALKS ON HORSESHOES.

(Application filed Feb. 28, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

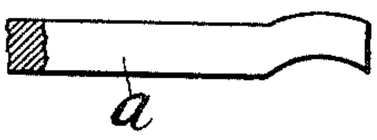
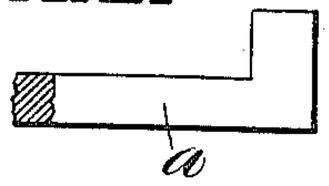


FIG. 3.



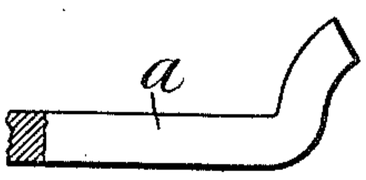


FIG. 2.

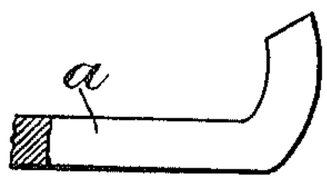


FIG. 5.

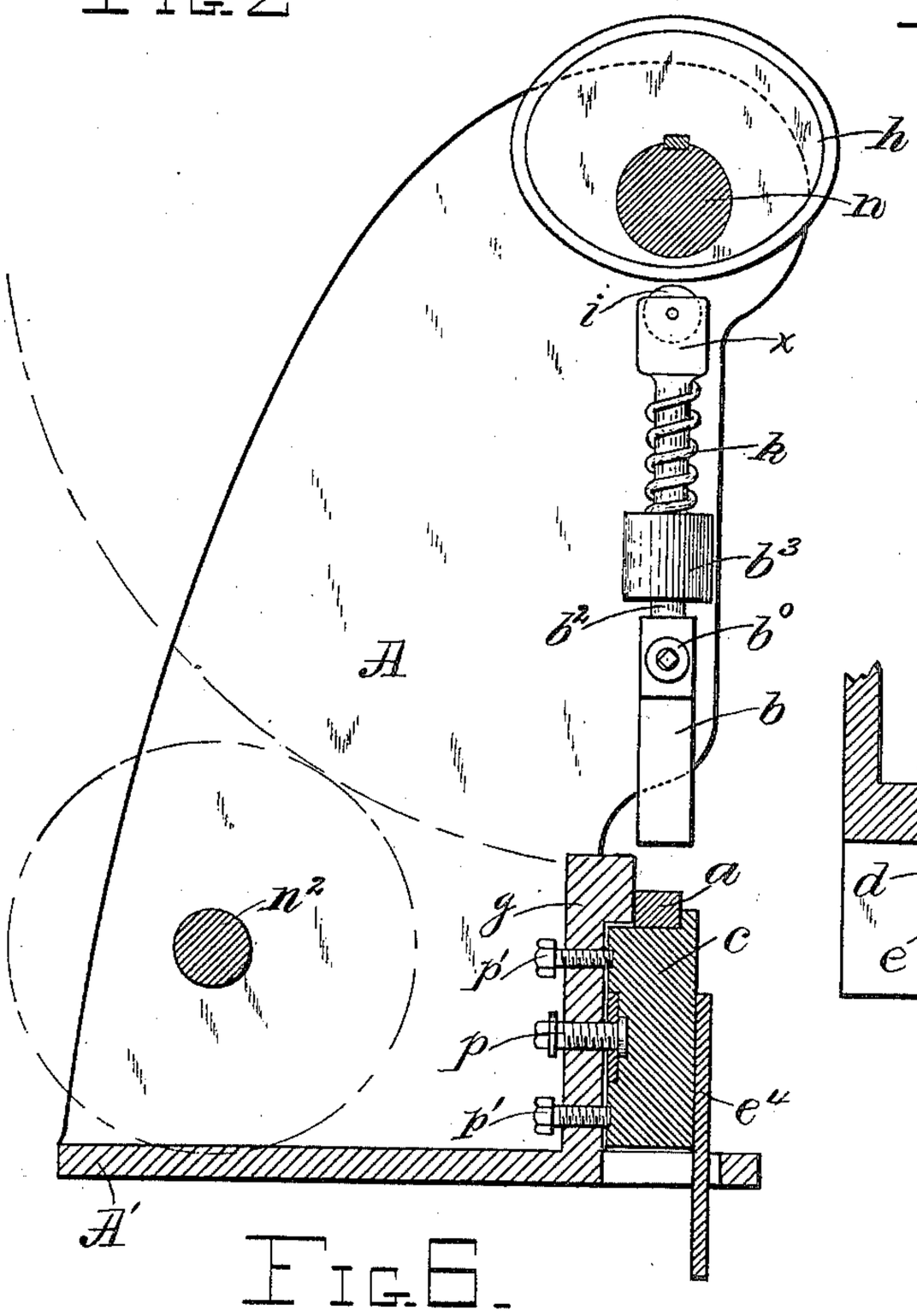


FIG. 6.

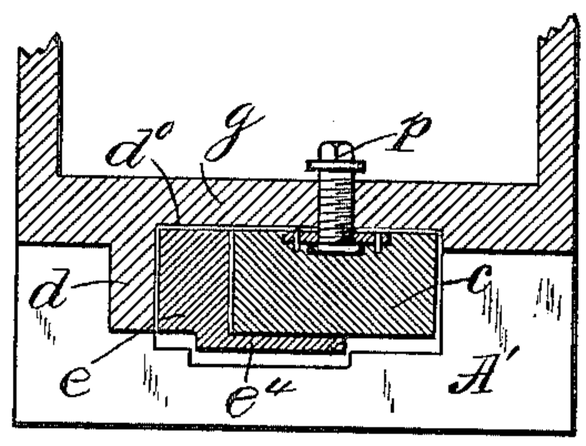


FIG. 8.

Witnesses
John A. Wall
J. Stephen Gingola

Inventor
Otto Kniep
by Wilkinson & Fisher
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 2 Sheets—Sheet 2.

FIG. 4.

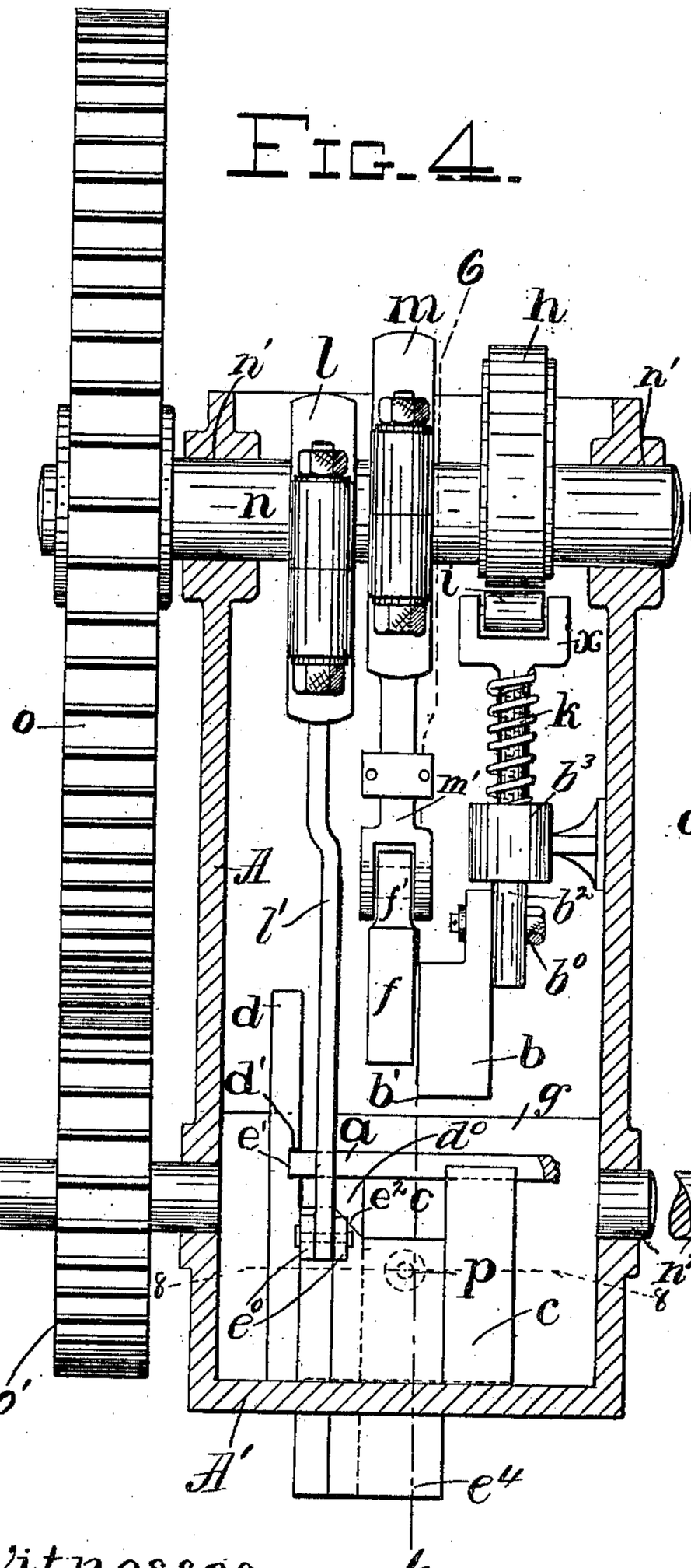
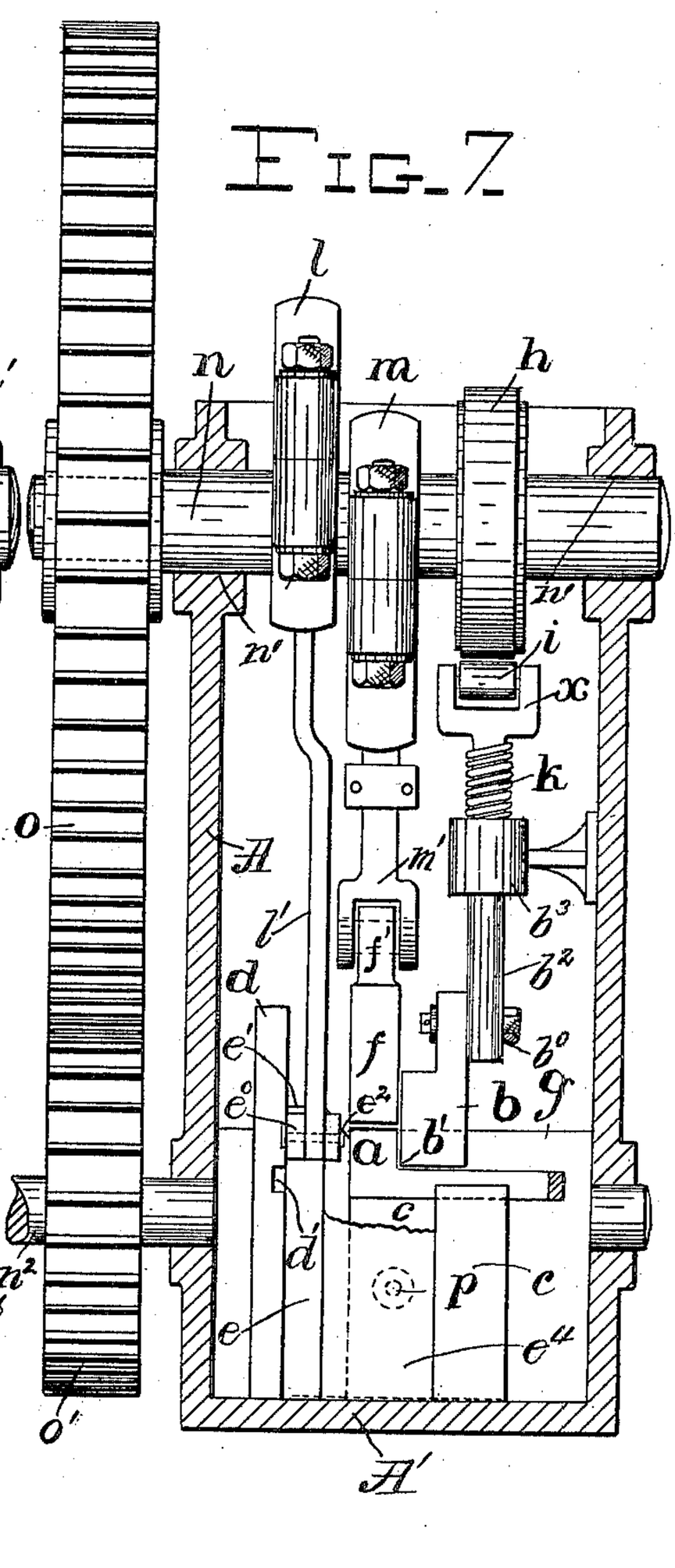


FIG. 7.



Witnesses
John Chelmore Edson.
D. H. Blakelock

Inventor
Otto Kniep
by Wilkinson & Fisher,
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OTTO KNIEP, OF SCHOENEBECK, GERMANY.

MACHINE FOR MAKING HEEL-CALKS ON HORSESHOES.

SPECIFICATION forming part of Letters Patent No. 622,493, dated April 4, 1899.

Application filed February 28, 1898. Serial No. 672,120. (No model.)

To all whom it may concern:

Be it known that I, OTTO KNIEP, a subject of the King of Prussia, German Emperor, residing at Schoenebeck, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Machines for Making Heel-Calks for Horseshoes, of which the following is a specification.

My invention relates to a machine for making heel-calks on horseshoes by means of which that portion of the shoe which is to be made into a calk receives a double bend, as when made by hand, in order to insure sharp edges; and it consists in the constructions and combinations of parts as hereinafter described and claimed.

In the accompanying drawings, in which similar parts are represented by similar letters throughout the several views, Figure 1 represents a portion of a horseshoe, showing the shape it assumes at the completion of the first bending operation. Fig. 2 represents the same at the completion of the second bending operation. Fig. 3 represents a portion of the shoe, showing the completed heel-calk. Fig. 4 is a side elevation, partly in section, of the complete machine, parts being broken away. Fig. 5 represents a portion of the horseshoe, showing how it appears when bent by hand. Fig. 6 is a longitudinal section of the machine on the line 6 6 of Fig. 4. Fig. 7 is a side elevation of the machine, parts being broken away, showing the stamps in a different position from that shown in Fig. 4. Fig. 8 is a cross-section taken on the line 8 8 of Fig. 4.

To effect the double bending, the shank of the shoe is clamped at a certain distance from the end, while the end itself is entered into a fixed part of the machine in such a manner that between the fixed part and the clamps there is space enough for the passage of a stamp. The parts are so arranged that after the end of the shoe has received the first bend it will just slip out of the groove. The continued movement of the stamp then produces the second bend. In other words, the shank is first bent up, as shown in Fig. 1. Then the free end of this upturned portion is bent back, as shown in Fig. 2, and then the calk portion is upset, as shown in Fig. 3. It is very difficult to perform these manipulations by hand, so that smiths usually made not square calks, but only hooks, as shown in Fig. 5, and as the latter were generally left pretty high horses provided with such shoes often slipped or became lame. It also was of frequent occurrence that owing to the lack of skill of the smiths the calk end of the shoe was bent back and forth several times, thereby weakening and making it probable that accidents would occur. All of these objections are overcome by the use of the machine shown in the drawings, in which—

A represents the frame of the machine, provided with the base A′. Extending across the machine and forming a stationary part thereof is the plate *g*. To this plate is adjustably secured the jaw or matrix *c* by a set-screw *p*, one end of which is swiveled in the matrix *c*, while the shank is screw-threaded to engage the threads in the plate *g*, through which it passes. In this way the matrix may be adjusted horizontally with regard to the plate *g* and when so adjusted is clamped in position by the screws *p*′. The matrix *c* rests upon the bed or base of the machine, as shown.

Rigidly secured to the plate *g* is the fixed jaw *d*, being located just beyond one end of the matrix and near one side of the machine, leaving between it and the matrix the space d^0. This fixed jaw *d* is provided with a groove *d*′, into which one end of the shoe-shank extends, as hereinafter more fully described.

The machine is provided with the movable jaw *b* and stamps *e* and *f*. The stamp *e* is located in the space d^0 between the jaw *d* and matrix and has a vertical movement in said space imparted to it by the rod *l*′, secured to the stamp near its lower end between the lugs e^0 and secured at its upper end to an eccentric *l*, mounted on the shaft *n*, which latter is journaled, as at *n*′, in the upper portion of the frame A. This stamp *e* is provided with a crown *e*′ and oblique upper edge e^2 and also with a side flange or lap e^4, which engages a portion of the face of the matrix *c* opposite the plate *g*. The stamp *f* is secured at its upper end, as at *f*′, in a bifurcated arm *m*′, the upper end of which is secured to the eccentric *m*, mounted on the shaft *n*. The movable jaw *b* is secured, as at b^0, to the rod b^2, which travels in a guide b^3, secured to the frame of the machine. The upper end of the

rod b^2 is bifurcated, as at x, and there provided with the roller i, mounted between the bifurcations and engaging an eccentric disk or cam h on the shaft n. The roller i is kept in contact with the cam by the spring k. The shaft n is driven by the gear-wheel o, which receives its motion from the gear o', mounted on the shaft n^2.

According to my invention the shank a, on which the calk is to be formed, is placed while hot upon the adjustable matrix c. At the same time one end of the shank extends into the groove d' in the fixed jaw d. The portion of the shank between the matrix c and jaw d is free—that is, it spans the recess separating the jaw and matrix. The shank having been placed in position on the matrix is first pressed downward upon the matrix and held securely thereupon by the movable jaw b. The first bending operation is accomplished by an upward blow being delivered against the free portion of the shank between the matrix c and jaw d by the stamp e. The crown e' of the stamp e, striking the shank, as stated, causes it to bend, as shown in Fig. 1, but as the stamp continues on its upward movement the curvature of the shank becomes so great that the end thereof slips out of the groove d'. The stamp e then continues on its upward movement, bending the shank upward and back until it assumes the shape shown in Fig. 2, the edge b' of the movable jaw b constituting the turning-point. The crown e' of the stamp or oblique edge e^2 of the same then passes up above the upturned end of the shank, and a second stamp f comes into play and works in a direction opposite to that of stamp e and fits accurately between the stamp e and the movable jaw b. The upturned portion of the shank being held securely between the jaw b and stamp e, the stamp f delivering its blow upon the top of the hot upturned portion of the shank upsets it and causes it to assume its final shape, as shown in Figs. 1 and 7. Sidewise slipping of the shank in the matrix is prevented by the plate g, which extends above the top of the matrix, and also by the lap e^4 of the stamp e, and as the matrix is made adjustable no interchanging of the same is required. The jaw b is depressed by means of the eccentric disk or cam h, and thus the shank of the horseshoe is clamped. As soon as the eccentric disk h recedes from the fork x and releases its pressure thereupon, the fork and the jaw b are raised by spring k to their normal position. The horseshoe-shank is held clamped by the action of the eccentric disk h and jaw b until the manipulations necessary to form the calk are completed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine for making heel-calks for horseshoes, the combination with a matrix, of a stationary jaw separated from said matrix by a recess, the said jaw having a recess arranged to receive one end of the shoe-shank while the body of the shank is supported by the matrix and spans the recess between the said matrix and jaw; a movable jaw; an arm secured to said jaw, and a guide carrying the same; a shaft; a cam mounted on said shaft; a roller carried by one end of said arm and engaging the periphery of said cam, the said movable jaw being thereby adapted to clamp the shank down on said matrix; a movable stamp adapted to strike the shank where it crosses the space between said matrix and said stationary jaw; an eccentric mounted on the aforesaid shaft and connected with and actuating said movable stamp; a second movable jaw; a second movable stamp working between the movable jaw and the aforesaid stamp and arranged to strike the upturned end of the shank between the said stamp and jaw and upset the same, and means for driving said shaft, substantially as described.

2. In a machine for making heel-calks for horseshoes, the combination with the frame of the machine of a matrix adjustably secured thereto, a stationary jaw separated from said matrix by a recess, said stationary jaw having a recess arranged to receive one end of the shoe-shank while the body of the shank rests upon said matrix and spans the recess between said matrix and said jaw; a movable jaw; an arm secured to said movable jaw; a spring mounted on said arm and normally exerting a pressure on said arm away from said matrix; a roller carried at one end of said arm; a cam adapted to actuate said arm and having its periphery normally in contact with said roller; a shaft carrying said cam and means for driving said shaft; a movable flanged stamp arranged to strike the shank where it crossess the space between said matrix and said stationary jaw; an eccentric mounted fast on said shaft and an arm connecting said eccentric with said movable stamp and actuating the same; a second movable stamp working between the movable jaw and the aforesaid stamp and arranged to strike the upturned end of the shank between said stamp and jaw and upset the same; a second eccentric mounted on said shaft, provided with an arm connected with the said second movable stamp whereby the said stamp is operated, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO KNIEP.

Witnesses:
HEINRICH BECMEN,
PAUL MÜLLER.