

(No Model.)

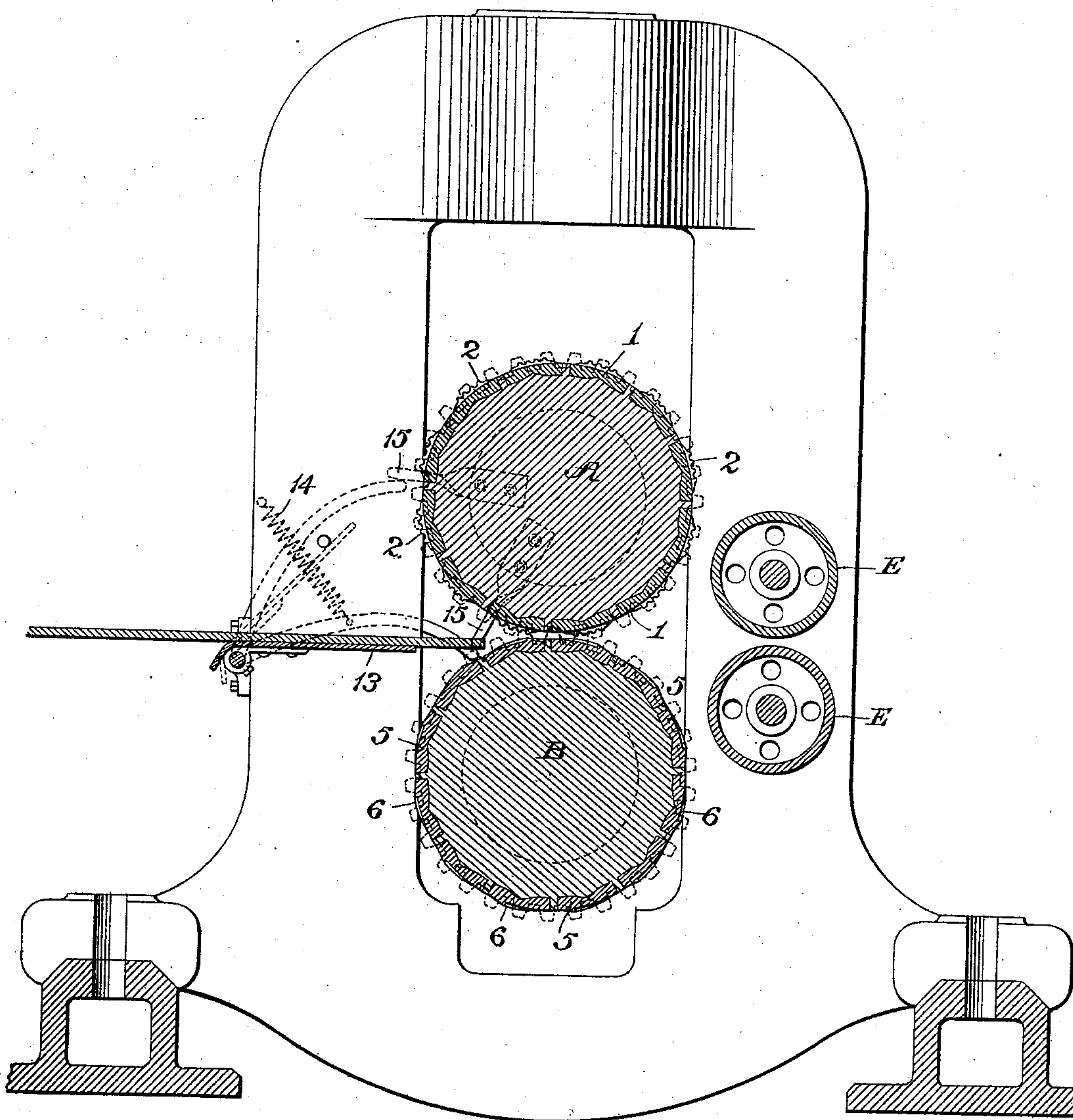
4 Sheets—Sheet 1.

A. H. COE.  
MACHINE FOR MANUFACTURING HORSESHOES.

No. 599,684.

Patented Mar. 1, 1898.

FIG. 1.



WITNESSES:

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INVENTOR,

*Andrew H. Coe*  
*by Danm. S. Wolcott*

Att'y.

(No Model.)

4 Sheets—Sheet 2.

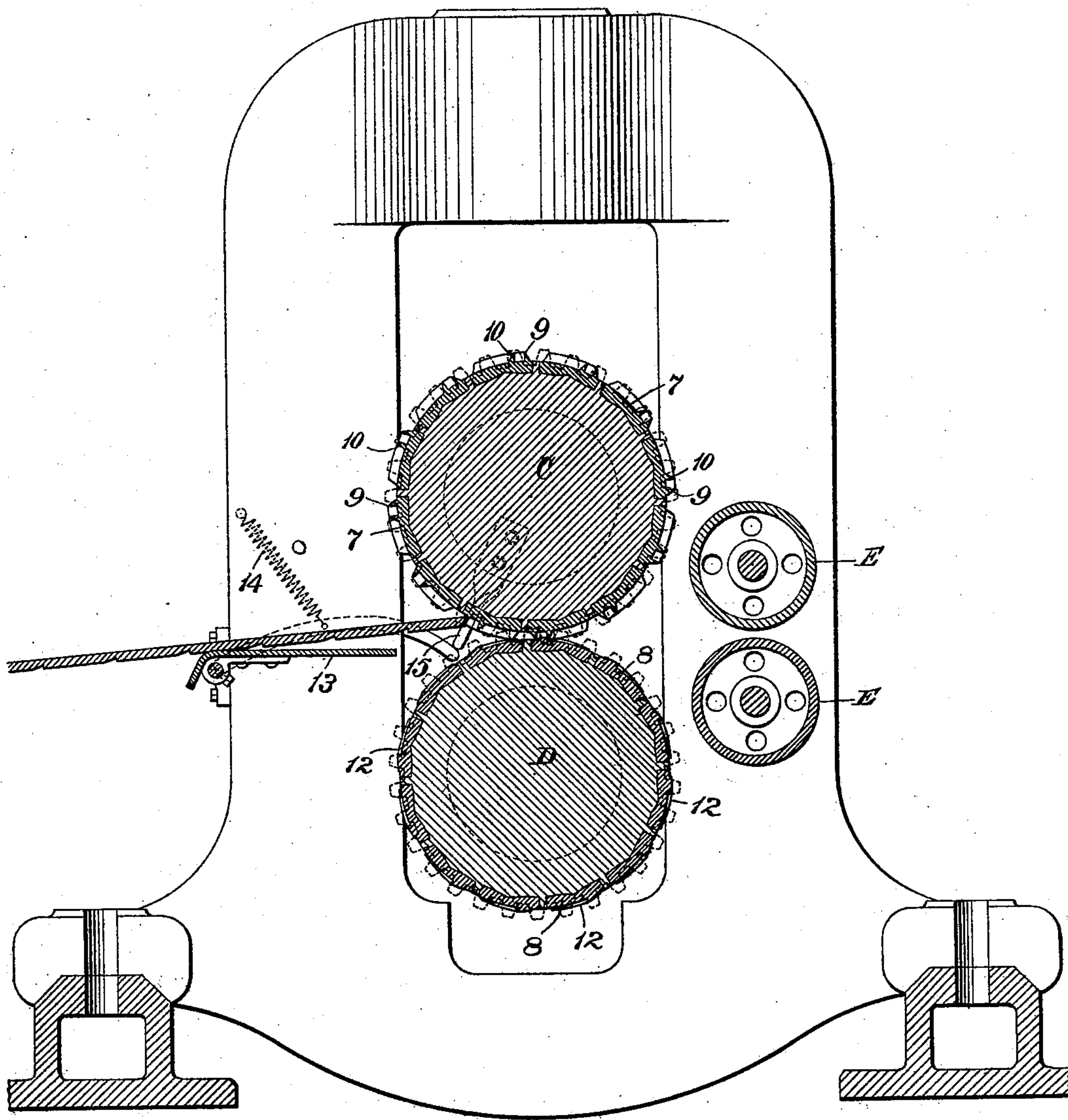
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FIG. 2.



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FIG. 4.

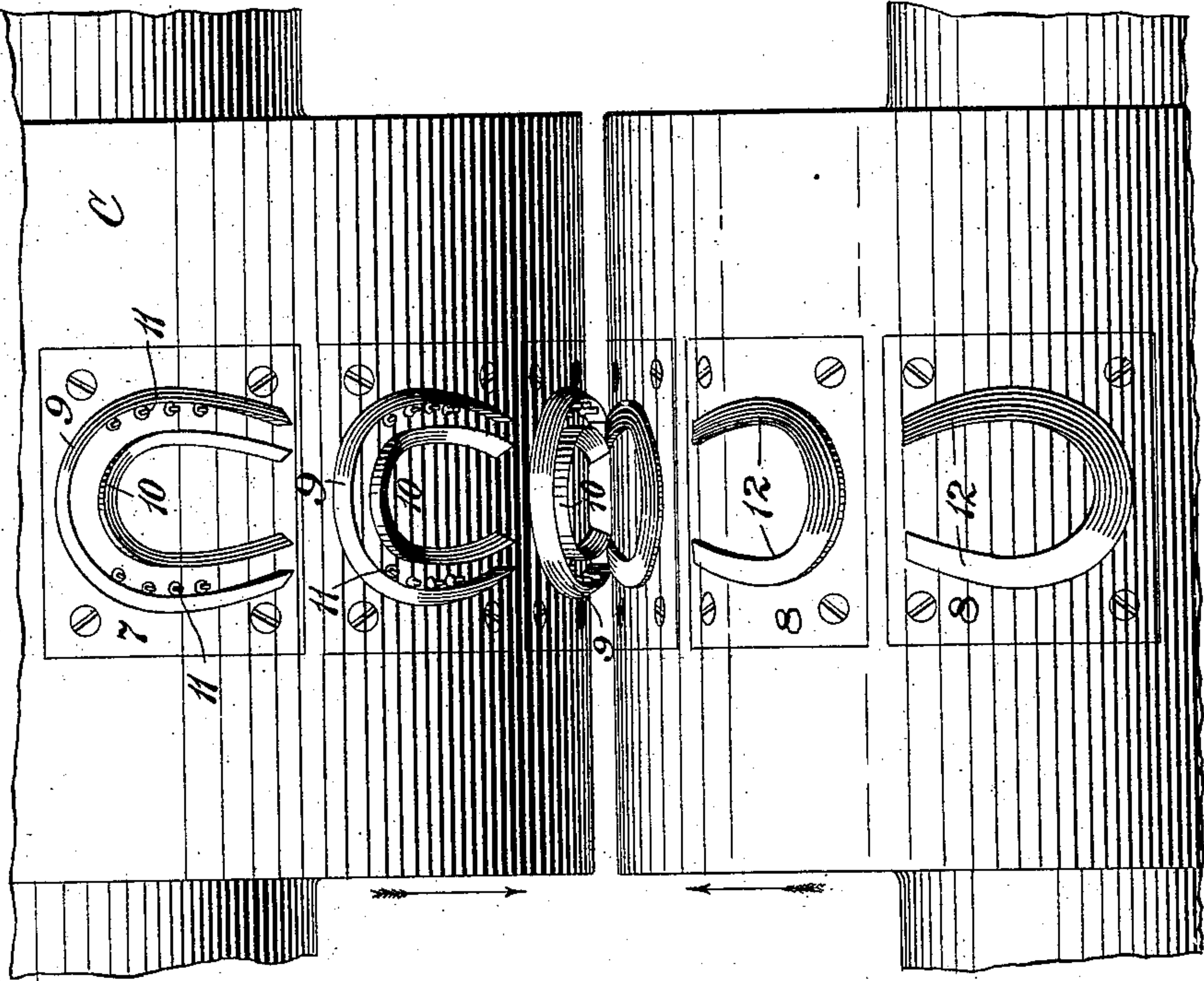
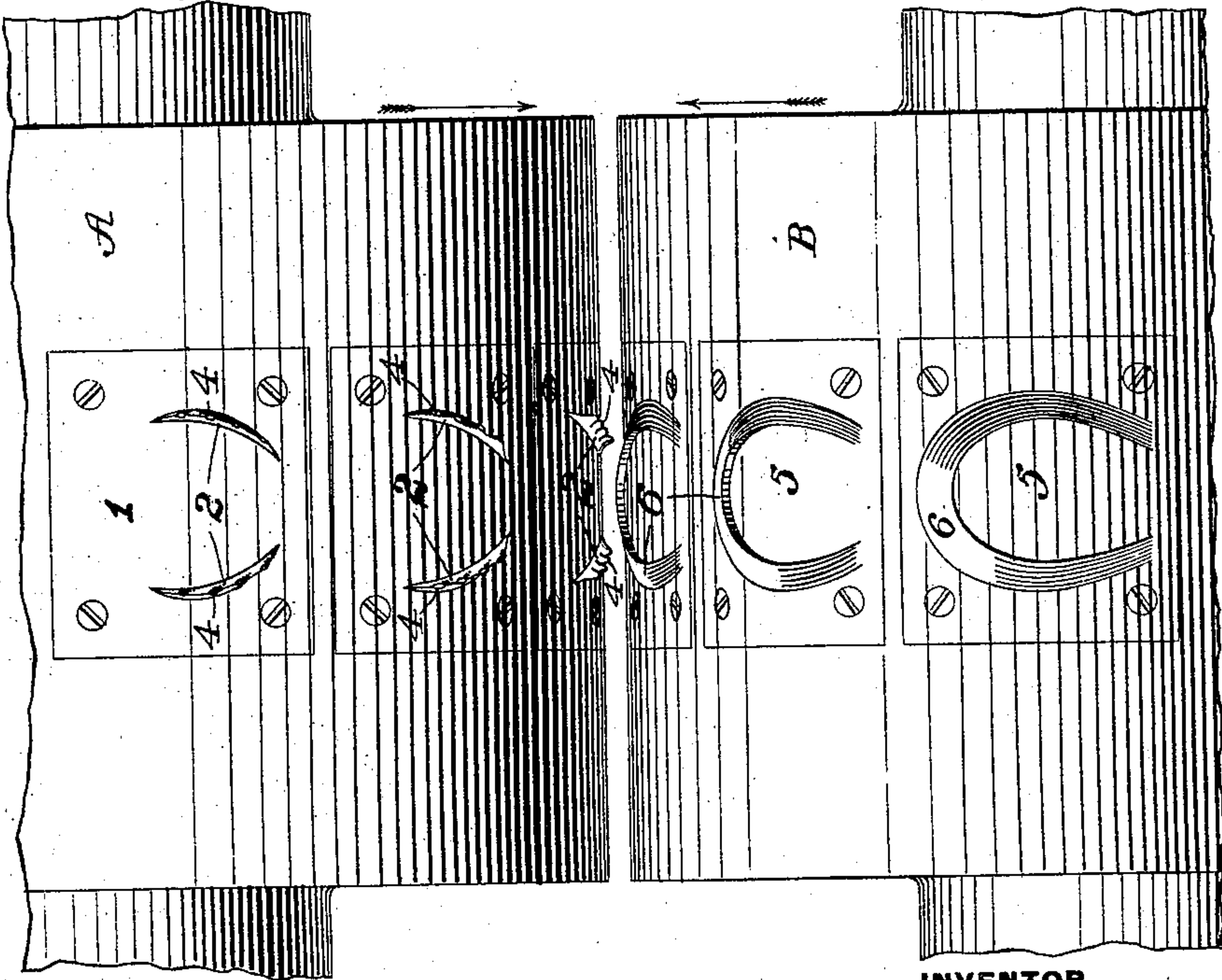


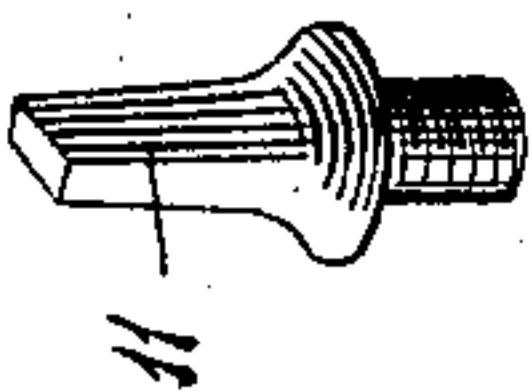
FIG. 3.



WITNESSES:

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FIG. 10.



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(No Model.)

4 Sheets—Sheet 4.

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FIG. 5.

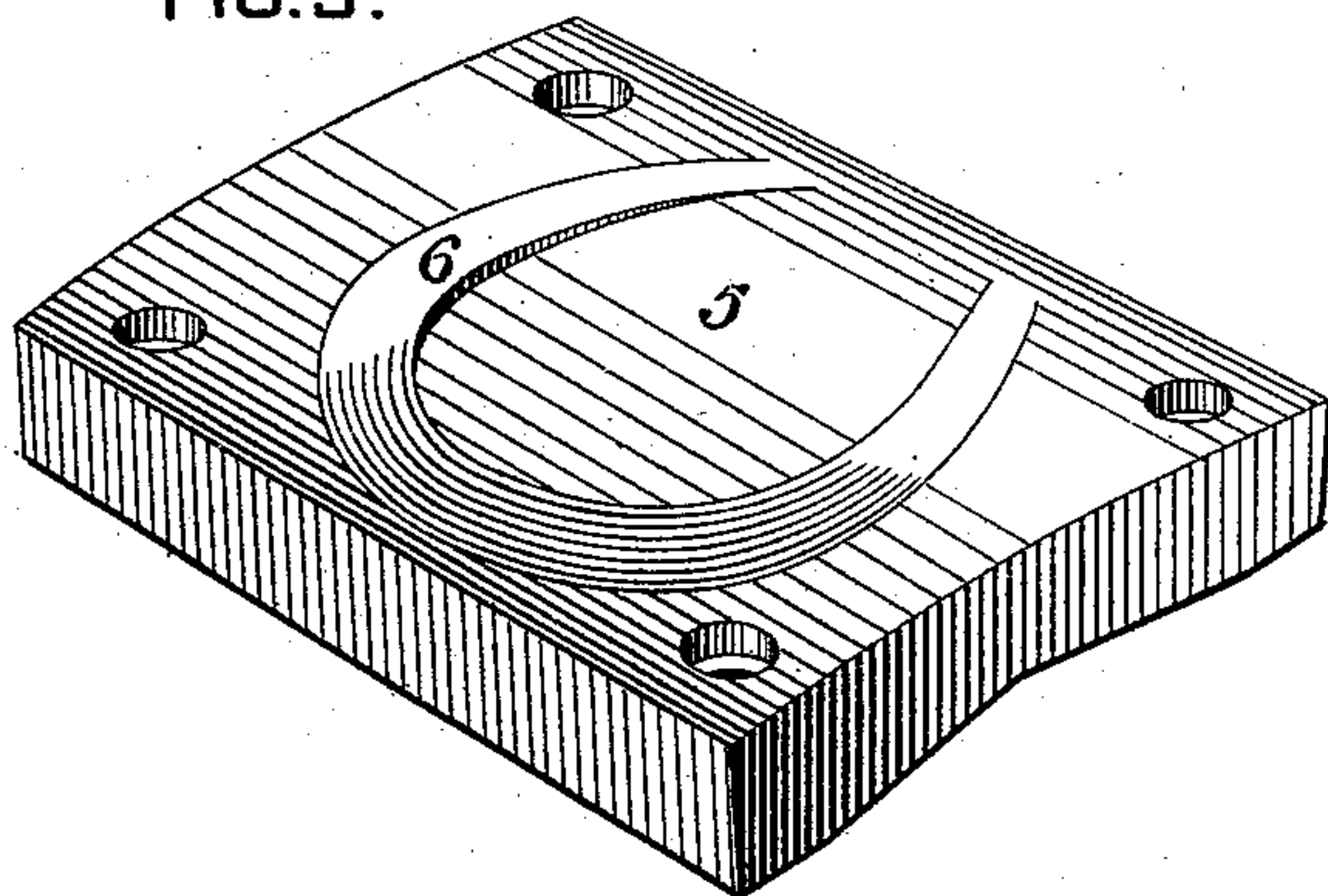


FIG. 6.

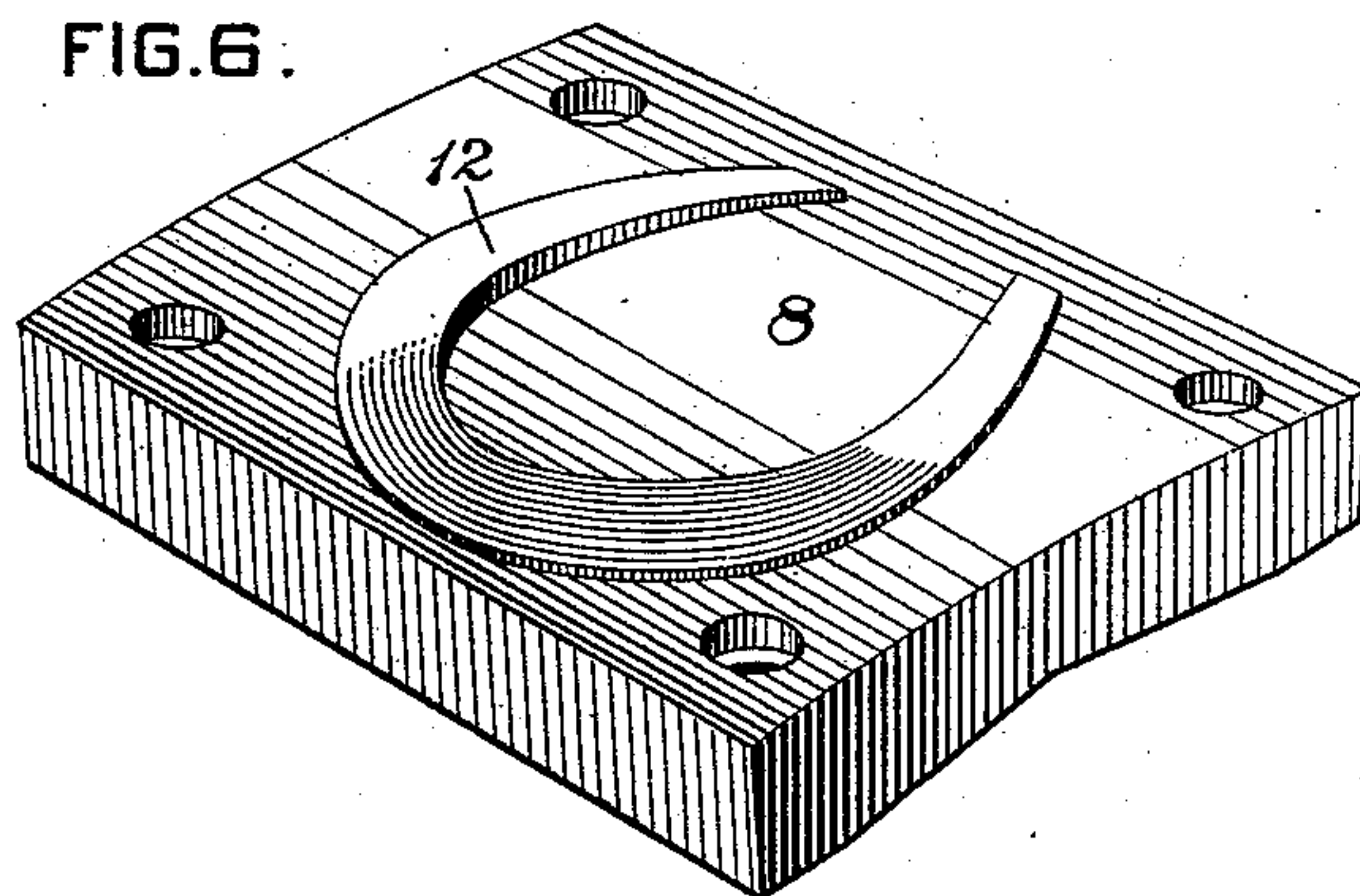


FIG. 7.

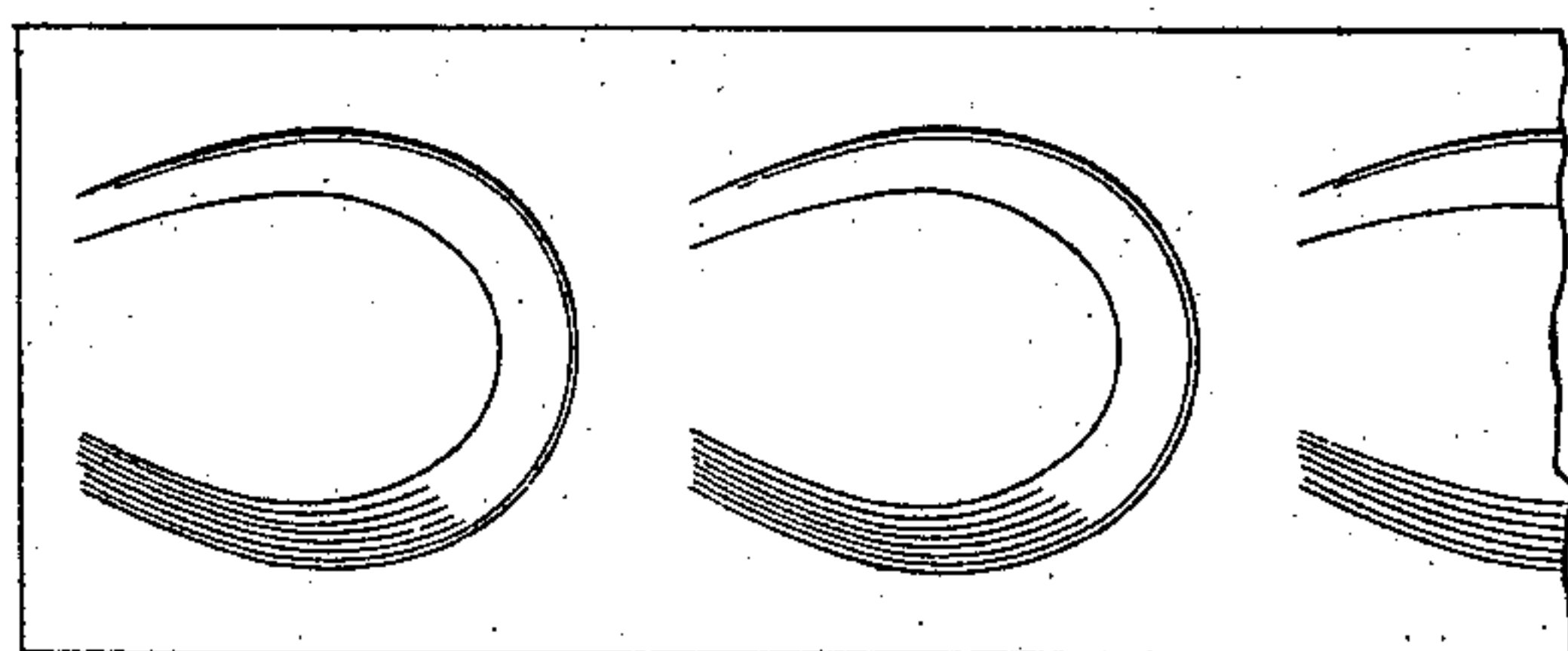
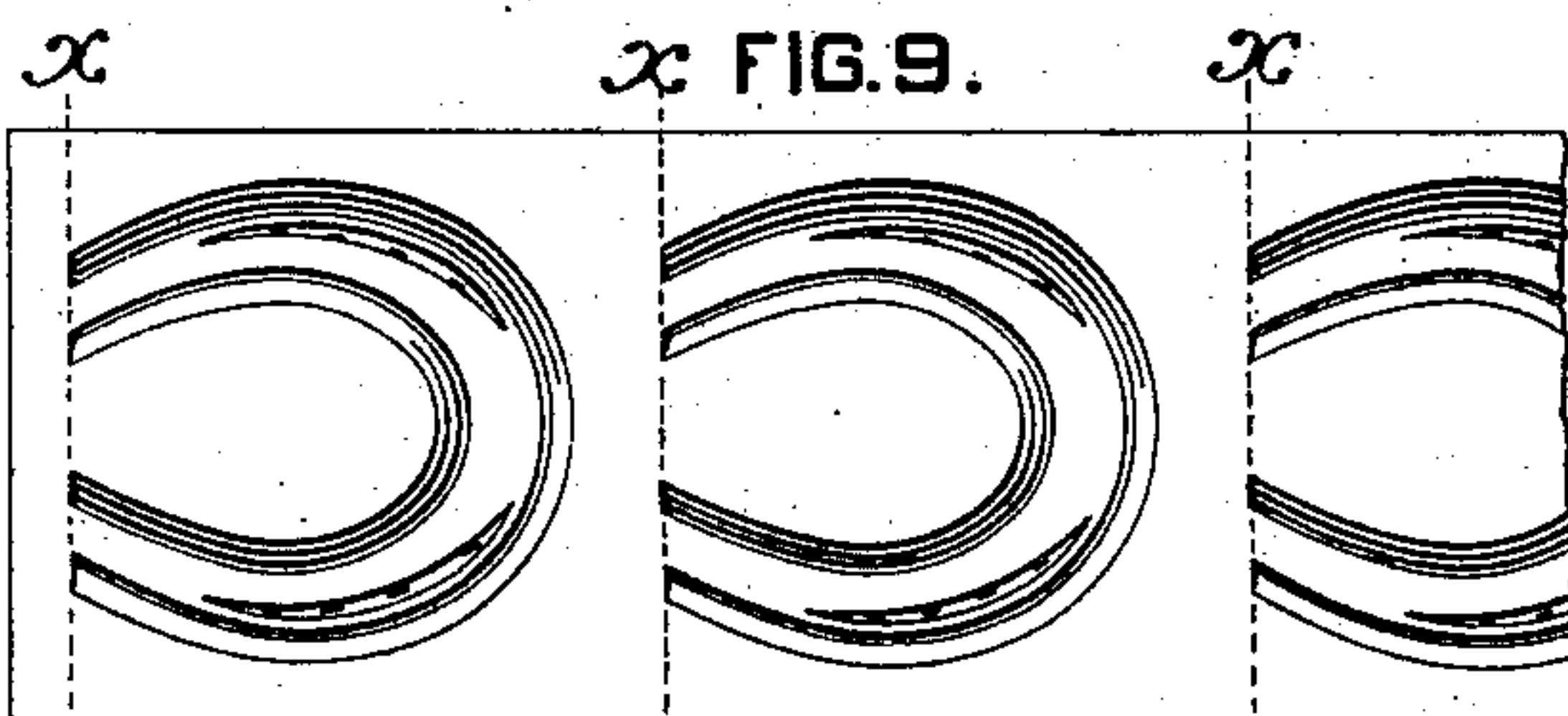
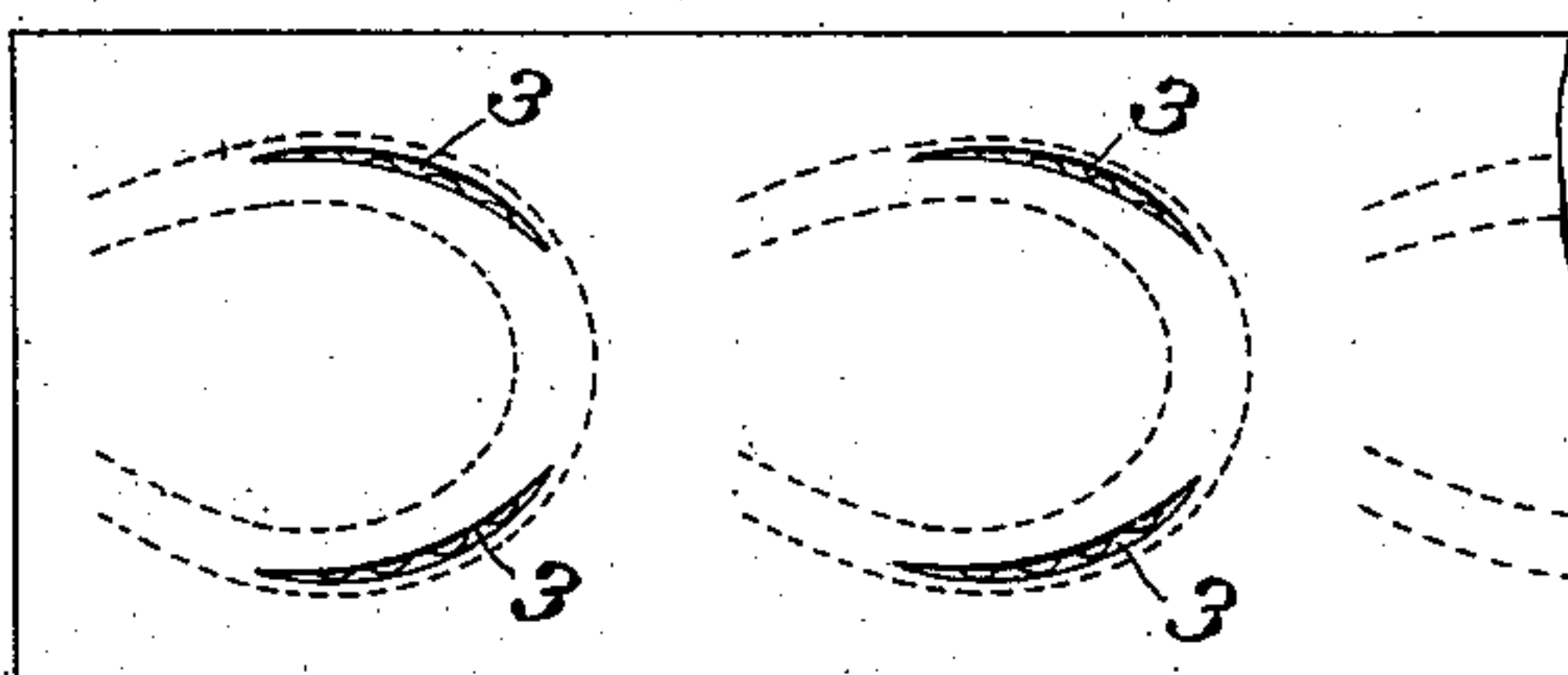


FIG. 8.



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# UNITED STATES PATENT OFFICE.

ANDREW H. COE, OF PITTSBURG, PENNSYLVANIA.

## MACHINE FOR MANUFACTURING HORSESHOES.

SPECIFICATION forming part of Letters Patent No. 599,684, dated March 1, 1898.

Application filed August 9, 1897. Serial No. 647,527. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW H. COE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in the Manufacture of Horseshoes, of which improvements the following is a specification.

The invention described herein relates to certain improvements in the manufacture of horseshoes, and has for its object a construction of mechanism whereby the several steps of concaving, creasing, countersinking, punching, and cutting out the completely shaped shoes may be effected while passing a sheet or strip of metal between rolls provided with suitably-shaped dies.

In general terms the invention consists in the construction and combination substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of a two-high mill, the rolls thereof having secured thereto suitable dies for concaving, creasing, and countersinking a sheet or strip of metal at suitable intervals. Fig. 2 is a similar view of a mill the rolls of which are provided with suitable dies for punching nail-holes through the previously creased and countersunk blank and for cutting the shoe-blanks from the metal sheet or strip. Figs. 3 and 4 are front elevations, on an enlarged scale, of portions of the rolls shown in Figs. 1 and 2, respectively. Fig. 5 is a detail view of one of the punches. Fig. 6 is a perspective view of one of the concaving-dies. Fig. 7 is a similar view of the male cutting-die; Figs. 8 and 9, plan views illustrating the action of the several dies; and Fig. 10 is a detailed view of one of the punches.

In the practice of my invention a strip of iron or steel of a width greater than that of the shoe to be formed and of a thickness approximately equal to that of the desired shoe is properly heated and passed between the rolls A and B. The roll A has secured thereto a series of dies 1, each of which is provided with two curved projecting ribs 2, adapted to form a pair of grooves 3 in the metal strip corresponding to the crease in the

bottom of the completed shoe. In order to form the countersink for the heads of the nails in the bottoms of the creases, the ribs 2 are provided with a series of projections 4, corresponding to the number of nail-holes to be formed.

In order to form the concavity or inclination extending from the outer to the inner edges on the upper surfaces of shoes, the roll B has secured thereto a series of dies 5, each of which is provided with raised portions 6, corresponding in outline or contour to the completed shoe. The upper or operative surfaces of these raised portions are beveled or inclined from their inner to their outer edges, so as to produce the desired concavity or inward inclination on the blank. As it is desirable to form the front portion of the shoe somewhat thinner than the heels, the raised portions 6 of the dies 5 are made higher at their front ends, and as these higher portions will act on the strip first the metal displaced by such higher portions will be squeezed back into the heel portions of the strip to produce increased thickness at such points.

After passing through the rolls A and B the strip, either with or without reheating, is passed between the rolls C D, which are provided with a series of dies 7 and 8, corresponding in number to those on the rolls A and B. The female die 7 is provided with ribs or raised shearing-blades 9 and 10, shaped to correspond in contour to the inner and outer edges of the shoe, respectively. A series of punches 11 are secured in the die between the ribs 9 and 10, corresponding in number and location to the projections 4 on the creasing-ribs, and adapted to complete the nail-holes which were begun by said projections. The male die 8 is provided with a raised portion 12, adapted to pass in between the ribs or raised shearing-blades 9 and 10, said parts being so constructed that the edges of the raised portion 12 will cooperate with the blades 9 and 10 to shear the shoe from the blank.

It will be observed that the dies 7 and 8 are so constructed that the shoe will be completely severed from the strip except at the heels of the shoe, which will remain connected to the strip, so as to pull the shoe from be-



tween the ribs or blades 9 and 10, between which it was forced in the cutting or stamping operation. After the strip has passed out of the rolls it is carried to an ordinary shearing-machine and cut transversely on the lines  $x$  in Fig. 9, thereby completely severing the shoe from the strip.

As the shoes might be bent or distorted in being stripped from the female dies, it is preferred to arrange a pair of plain straightening-rolls E in the rear of the rolls C D for restoring the strip and adhering shoes to normal condition. If desired, similar straightening-rolls may be arranged in the rear of the rolls A B.

The dies may be secured on the rolls in any suitable manner, but it is preferred to arrange them in recesses in the rolls. In order to secure the dies as against movement, the under sides thereof are made with opposite inclines and the bottoms of the recesses are similarly shaped, as shown in Figs. 1 and 2. As the punches 11 are liable to more rapid wear than other portions of the dies, it is preferred to construct them with threaded stems, as shown in Fig. 10, so that they can be screwed into threaded holes in the dies 7.

In order to insure the accurate matching of the dies of the rolls A B and C D with each other, accurately-fitting pinions are secured on the journals of the rolls, as shown by dotted lines in Figs. 1 and 2.

By reference to Figs. 1 to 4, inclusive, it will be seen that the dies on the rolls A B are so arranged as to operate on the strip from toe to heel, while the dies on the rolls C D are oppositely arranged and operate on the strip from heel to toe. By reason of this reverse operation of the dies of the two sets or stands of rolls it is necessary to reverse the feed of the strip after passing through the rolls A B and to feed the rear of the strip first into the rolls C D.

As it is necessary that the dies on the rolls C D should operate on the same portions of

the strip as the dies of the rolls A B, a gate 13 is pivotally mounted on the housings of the rolls C D and is yieldingly held in a raised position in front of the rolls by a spring 14. This gate is forced down to permit a piece being fed into rolls by an arm 15 on one of the rolls, or its journal, striking against an arm on the shaft of the gate, as shown in Fig. 2. A similar feed-controlling mechanism may be arranged in front of the rolls A B, if desired.

I claim herein as my invention—

1. A roll provided with a series of creasing-dies in combination with a roll provided with a series of concaving-dies arranged to operate in line with the creasing-dies, but on the opposite side of a strip of metal, substantially as set forth.

2. A roll provided with a series of creasing and countersinking dies in combination with a roll provided with a series of concaving-dies arranged to operate in line with the creasing-dies, but on the opposite side of a strip of metal, substantially as set forth.

3. A roll provided with a series of dies having U-shaped ribs or shearing-blades, in combination with a roll provided with a series of dies having correspondingly-shaped raised portions adapted to pass between the ribs of the other dies, substantially as set forth.

4. A roll provided with a series of dies having U-shaped ribs or shearing-blades and a series of punches arranged between the ribs or blades, in combination with a roll provided with a series of dies having correspondingly-shaped raised portions adapted to pass between the ribs or blades of the other dies, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ANDREW H. COE.

Witnesses:

DARWIN S. WOLCOTT,  
F. E. GAITHER.