

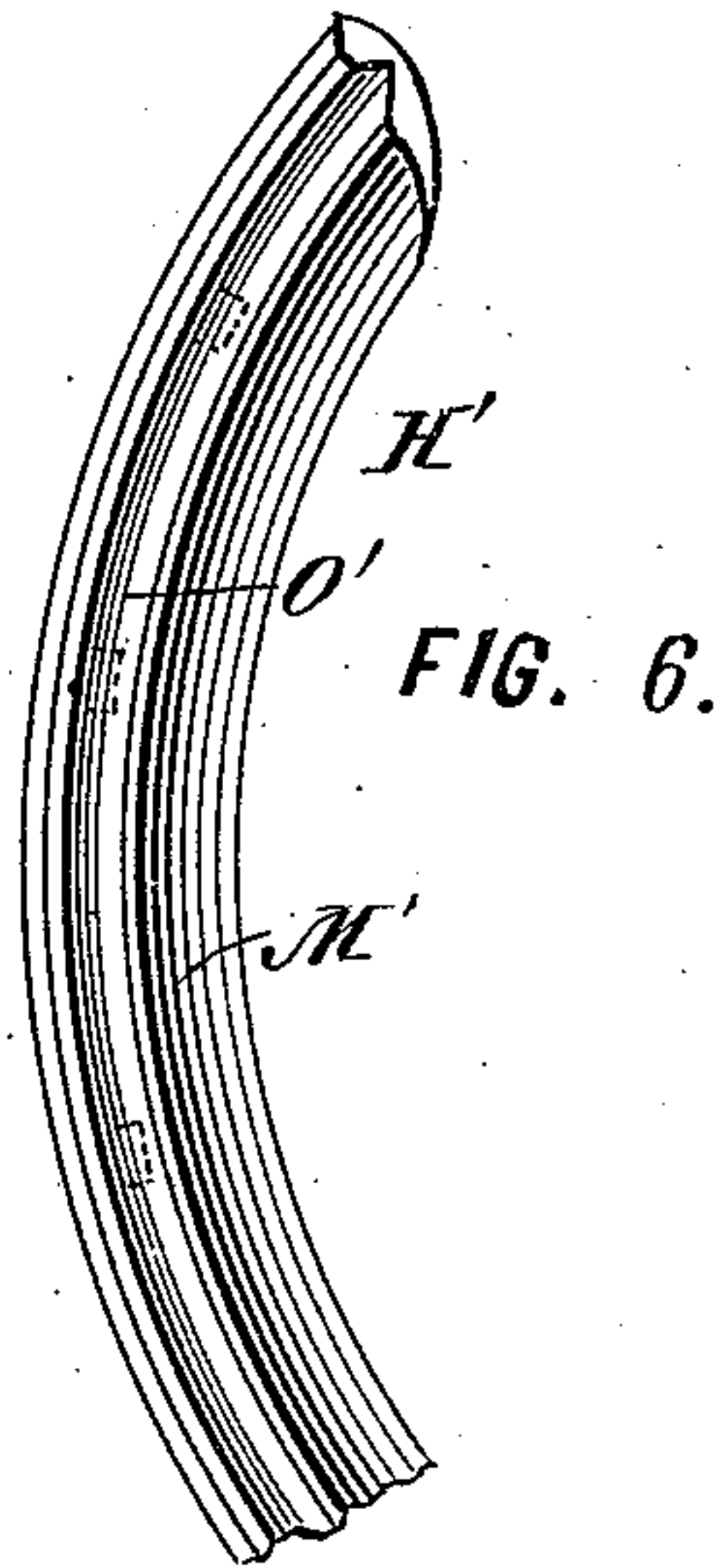
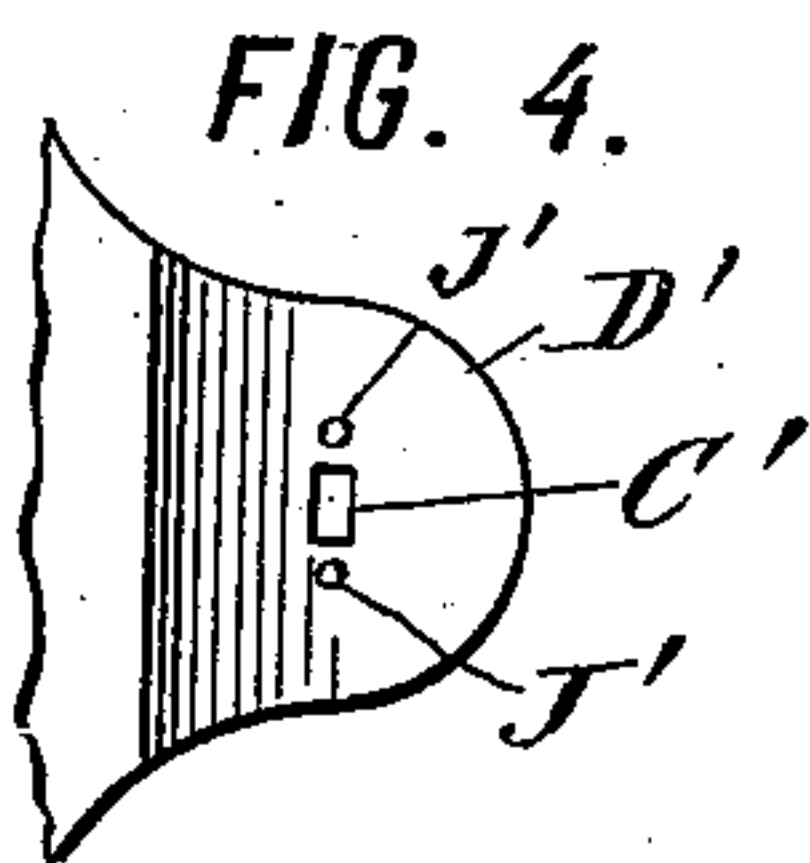
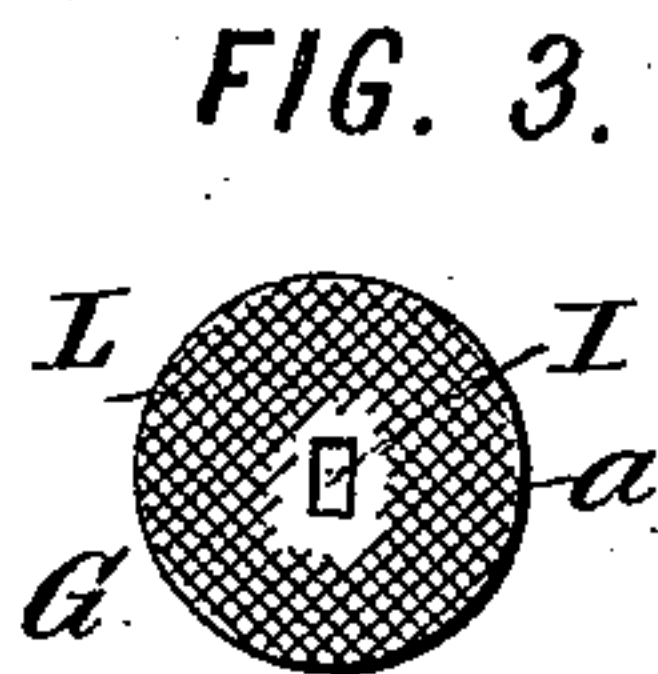
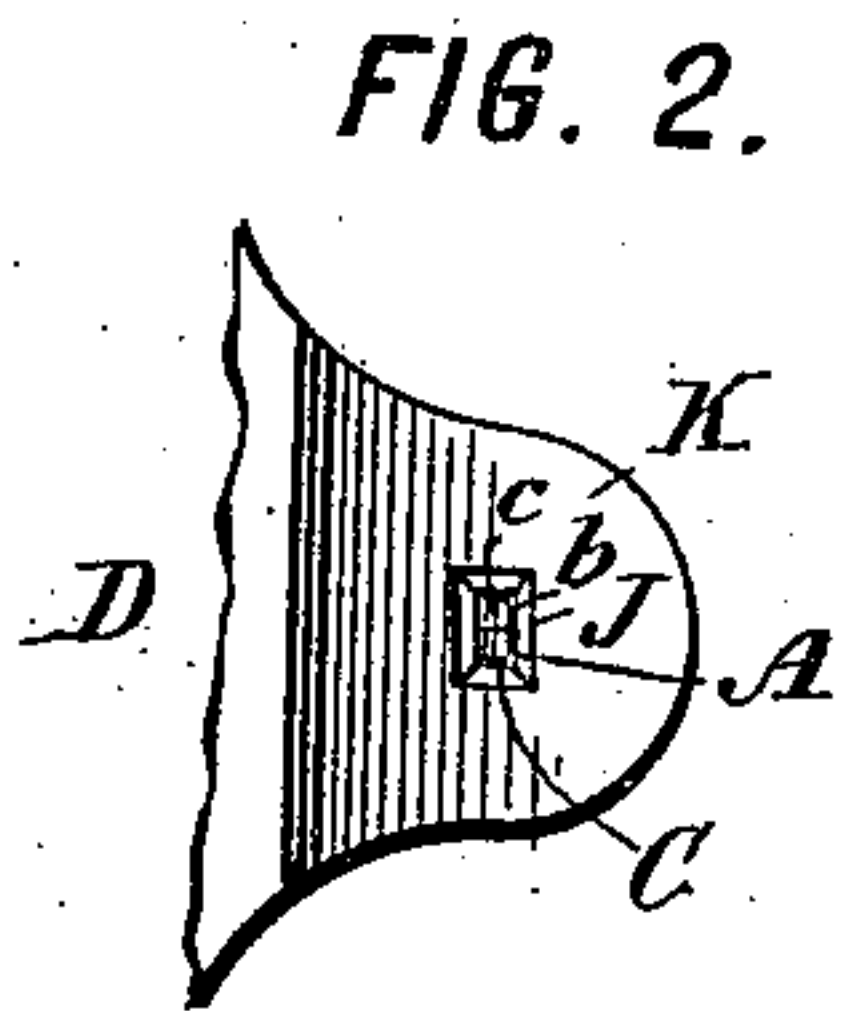
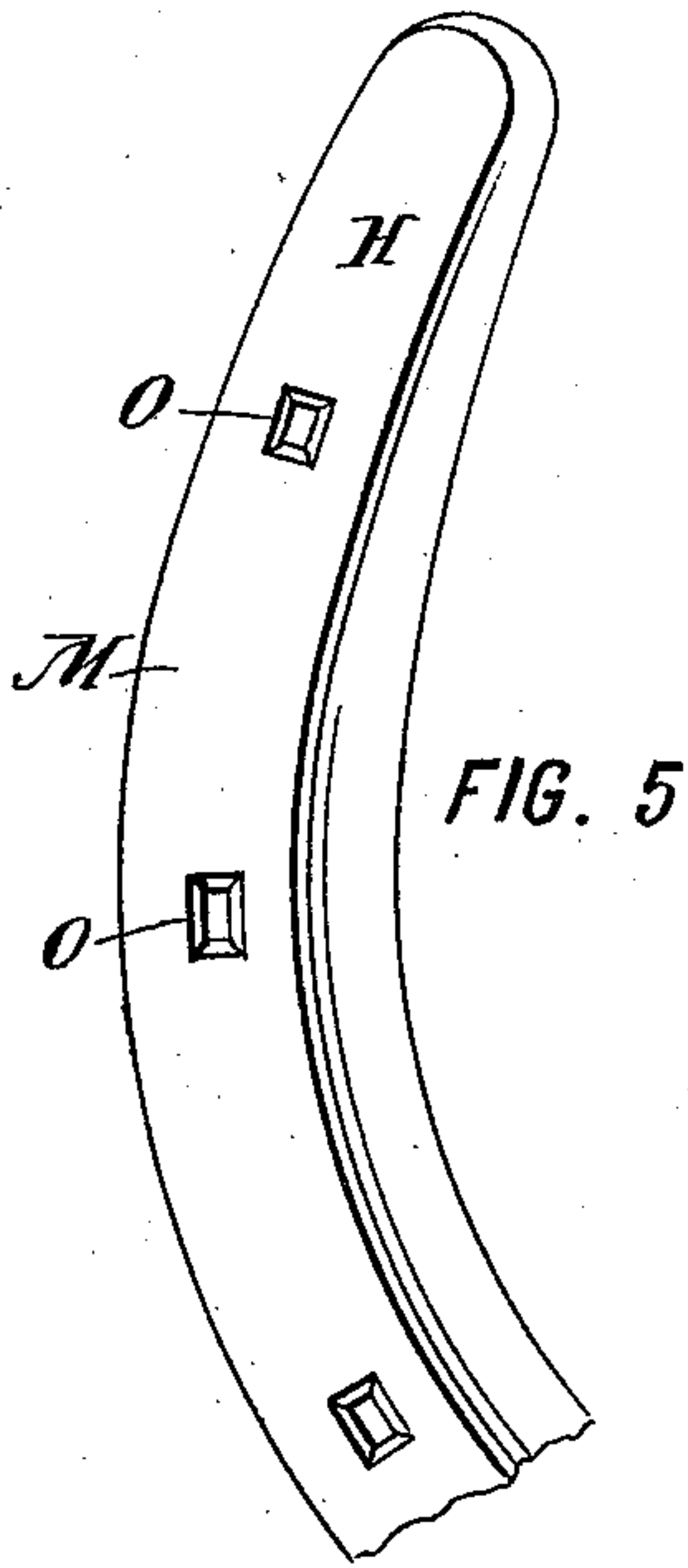
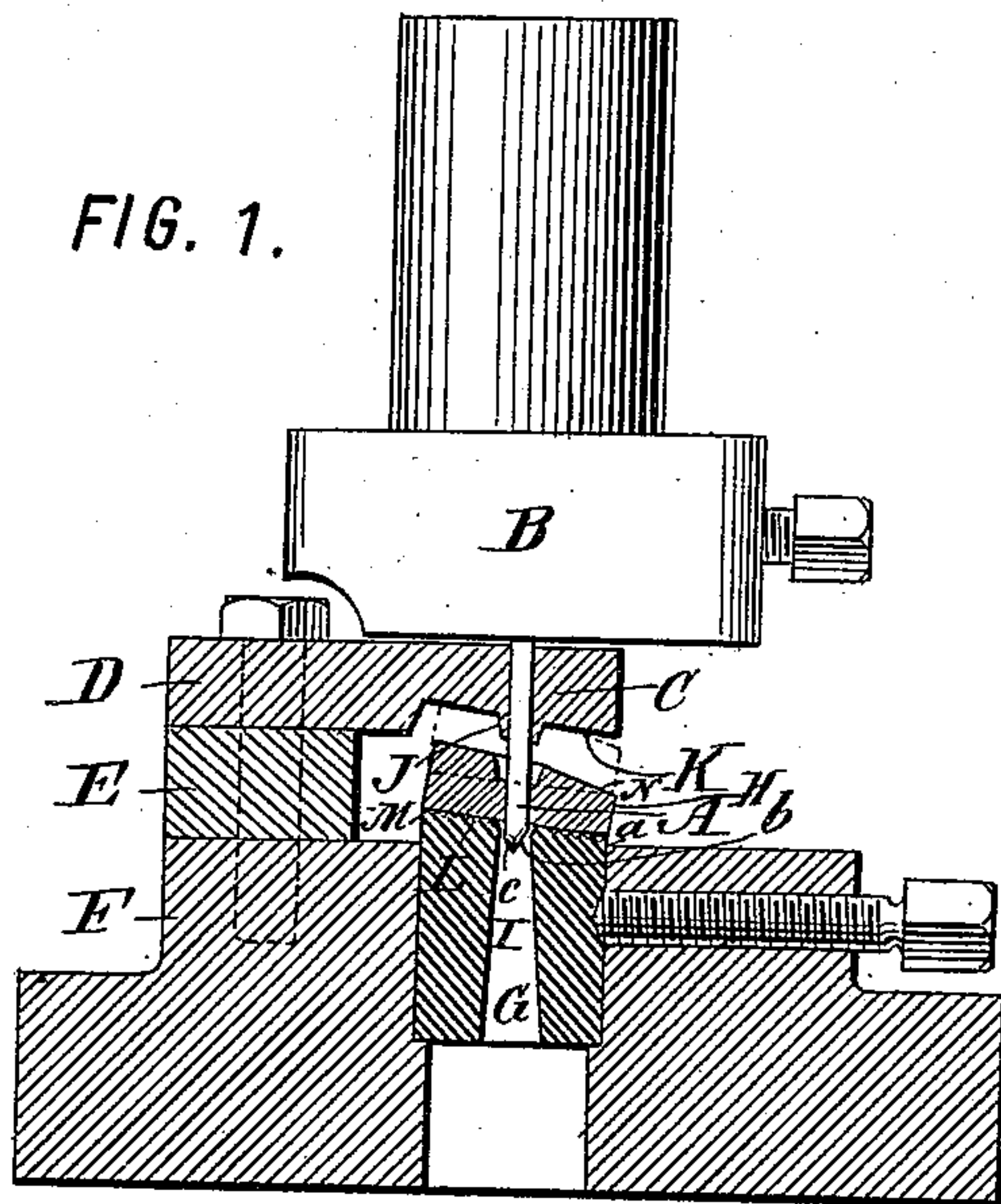
(No Model.)

W. J. KENT.

PUNCHING MACHINE FOR MAKING NAIL HOLES IN HORSESHOES.

No. 553,585.

Patented Jan. 28, 1896.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM J. KENT, OF BROOKLYN, NEW YORK.

PUNCHING-MACHINE FOR MAKING NAIL-HOLES IN HORSESHOES.

SPECIFICATION forming part of Letters Patent No. 553,585, dated January 28, 1896.

Application filed April 27, 1895. Serial No. 547,299. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. KENT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Punching-Machines for Making Nail-Holes in Horseshoes and for other Purposes, of which the following is a specification.

10 This invention relates to punches and the like, particularly to those for such purposes as punching nail-holes in horseshoes, and aims to provide certain improvements in such devices.

15 In horseshoes the holes through which are punched at predetermined points by holding the shoe by hand opposite the punch above a die it is desirable to have a guide for indicating the correct location of the shoe relatively to the punch before punching and a  
20 stripper which will accurately draw the shoe from the punch as the latter rises. In many instances the punched holes are inclined relatively to the top and bottom faces of the shoe, and these faces are inclined relatively to  
25 each other. The holes are usually punched from the bottom face to the top face, indentations, grooves, or other means on the bottom face being provided to indicate the points for  
30 the holes. The bottom or working face of the shoe is usually of relatively hard metal, and the top or hoof face or bearing is usually of soft or light metal. To hold the shoe at the desired inclination the face of the die is  
35 usually inclined relatively to the stroke of the punch. As the latter goes through the body of the shoe there is a tendency for the shoe to slip downwardly on the inclined die, and for the punch to feed laterally so that it  
40 will strike the lower edge of the die.

My invention provides an improved punch by means of which the shoe can be accurately located relatively to the die and initially properly inclined opposite the punch, and means  
45 for overcoming the slipping tendency of the shoe during punching and the displacement of the punch itself.

In carrying out the preferred form of the invention I provide on the under face of the  
50 punch-guide a work-guide fitting into the indentations or like provisions on the shoe, closely surrounding the punch and serving,

when the shoe is raised into engagement with the guide prior to punching, to hold the latter in proper position and at the withdrawal  
55 of the punch to strip the shoe from the latter properly; and I also provide on the bottom face of the punch-guide a face or plane extending angularly to the travel of the punch at the same angle that the working face of  
60 the shoe occupies during the punching operation, against which plane the working face of the shoe can be pressed prior to punching, so that when the punch strikes it the shoe will be properly inclined; and I construct the  
65 face of the die angularly relatively to the path of the punch and corresponding in its angularity to that of the hoof-face of the shoe, so that when the latter rests on the die it will be firmly seated thereon; and I provide for  
70 preventing slipping of the shoe on the die by constructing the latter with roughenings or equivalent gripping provisions which penetrate or grip the soft metal of the shoe as the latter is forced against the die at the com-  
75 mencement of the punching operation and thereby hold the shoe fixedly on the die; and I further bevel the face of the punch to a greater extent on its side adjacent to the lower side of the die, so that its tendency will be as  
80 it feeds through the metal of the shoe to be distorted inwardly toward the higher side of the die, this tendency being adjusted to approximately equal the tendency to outward distortion of the punch due to the inclination  
85 of the work.

In the accompanying drawings, which illustrate certain adaptations of my improvement, Figure 1 is a side elevation of the punch, showing its guide and the die in axial section. 90 Fig. 2 is a fragmentary under side view of the punch-guide. Fig. 3 is a plan view of the die. Fig. 4 is a view corresponding to Fig. 2, but showing a modification. Fig. 5 is a fragmentary view of the bottom face of a shoe-blank  
95 adapted to be punched by the construction of punch and die shown in Fig. 1, and Fig. 6 is a similar view of a construction of shoe-blank which can be punched by either the construction shown in Fig. 1 or that shown  
100 in Fig. 4.

Referring to the drawings, let A indicate a reciprocating punch; B, a head or holder driving the latter; C, a guide for the punch; D, a



bracket in which the guide is formed; E, a post carrying the bracket; F, a bed on which the post E is fixed; G, a die fixed in the bed opposite the punch; H, a shoe-blank to be punched; I, the hole in the die into which the end of the punch A passes; J, a stripper and guide for the work; K, a starting face, stop, or guide against which the work can be located, and L the top face of the die.

The shoe-blanks are usually formed with hard or partially-hard bottom faces M and soft top bearing-faces N, the construction being shown in Fig. 5 and seen in section in Fig. 1, and are formed with indentations O at the points where the nail-holes are to be provided. In some constructions of blanks the top and bottom faces of the blank are relatively inclined, as is the case with the blank H. (See Fig. 1.) In the construction shown in Fig. 6 the blank lettered H' has an irregular bottom face M', having a longitudinal groove O' within which the holes should be punched.

In the punching the shoe is held bottom up, passed between the punch and die, raised until its working face is against the face K of the punch-guide, and held in this position until the punch descends and forces the shoe against the die, against which it is held as the punch penetrates the shoe.

According to the preferred form of my invention, as shown in Figs. 1, 2, and 3, I provide the work guide and stripper J on the under face of the bracket D preferably by forming it as a downwardly-projecting lip therefrom surrounding the punch on all sides and shaped to fit the indentations in the working face of the shoe in such manner that when the shoe is raised against the guide and stripper until the latter is seated in one of the punch-holes the shoe can be preserved in position relatively to the punch until the latter strikes it, and on the return of the punch as the shoe is lifted by the latter the stripper will again enter the indentation and when home therein arrest the shoe, so that it will be properly stripped from the punch as the latter continues to rise. The guide and stripper is preferably a downward projection or lip close to the punch and sufficiently elevated above the die to permit the easy insertion of the shoe beneath it.

Another feature of improvement lies in constructing the face K with the contour or inclination corresponding to the shape and position of the working face of the shoe when the latter is disposed angularly of the path of the punch to give the proper inclination of the nail-holes. Thus this face should be parallel with the working face of the shoe when the bearing-face of the latter is seated on the die as in punching. By this provision the shoe occupies the proper position when first struck by the punch, so that it need not change its inclination in moving from the top guide to the die-face.

Another feature of improvement resides in

constructing the die with gripping or other suitable provisions engaging the work and preventing its displacement during the punching. This is preferably accomplished by forming the top face L of the die with a plurality of sharp projections or roughenings *a*, which penetrate the soft bearing-face of the shoe when the latter is forced against the die by the punch, and thereby prevent the shoe from slipping down the inclined top L of the die. Thus the shoe is held on the die throughout the punching at substantially the same position relatively to the latter as it occupies when first reaching the die.

Another improvement incident to my invention consists in constructing the working end of the punch in such manner that the tendency to lateral distortion by reason of the inclination of the work will be approximately overcome by a substantially equal tendency to opposite distortion in penetrating the work so that the punch will remain in its path and properly enter the hole I in the die. This is accomplished by constructing the end of the punch with a greater inclined face adjacent to the lower side of the die and a lesser inclined face adjacent to the upper side, so that the face of greater inclination in passing through the work tends to feed the punch toward the upper side of the die. The relation of these faces is preferably that shown where-in the face *b* is substantially twice as wide as the face *c*, but the relative difference between the faces must be proportioned according to the nature or inclination of the work.

It will be seen that my invention provides improvements in punches which can be easily and advantageously availed of, and it will be understood that the invention is not limited to the particular adaptation set forth as constituting its preferred form, as it can be adopted according to such modifications as circumstances or the judgment of those skilled in the art may dictate without departing from the spirit of the invention.

A modification is shown in Fig. 4, in which the punch-guide lettered C' traverses the bracket lettered D', and at each side of the guide are projections or pins J' serving as the work guiding and stripping provision. This construction can be advantageously used where holes are to be punched in shoes of the character shown in Fig. 6 having a longitudinal groove on its working face, since the pins will rest in the groove and thereby guide the shoe-blank relatively to the punch, and by striking the bottom of the groove as the punch rises will serve to strip the shoe from the latter.

What I claim is—

1. In punches and the like, a reciprocating punch, in combination with a punch-guide therefor, a bracket in which said punch-guide is formed, and a work guide consisting of a projection at the side of said bracket toward the work, adjacent to the punch, at the sides of said punch-guide, and engaging the work when the latter is held toward said bracket



and thereby locating the work for the punching operation.

2. In punches and the like a reciprocating punch, a bracket traversed by a hole through which the punch moves, and a face K on said bracket, said face inclined relatively to the path of the work, corresponding in its inclination to the inclination of the adjacent face of the work when being operated on by the punch, and engaging said face of the work prior to punching, and thereby locating the work, substantially as and for the purpose set forth.

3. In punches and the like, a reciprocating punch and a die opposed thereto and having an inclined working face and a hole receiving the punch, said punch having a wide beveled face on its end at its side adjacent to the lower side of the face of the die, and a narrow oppositely beveled edge face on its side adjacent to the higher face of the die, whereby in penetrating the work the tendency of the

punch to distortion toward the lower face of the die is overcome by the tendency to opposite distortion as its differential faces penetrate the work.

4. In punches for punching nail holes in shoe blanks, the punch A, in combination with the bracket D having guide holes C through which the punch reciprocates, guiding and stripping lip J at its lower side surrounding the punch, face K on its lower side against which the work to be punched can be held, and a die G opposite said punch, having an inclined and roughened face L opposed thereto, substantially as and for the purpose set forth.

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

WILLIAM J. KENT.

Witnesses:

GEORGE H. FRASER,

THOMAS F. WALLACE.