

(No Model.)

F. L. HARMON.
DIE BLOCK.

No. 579,537.

Patented Mar. 23, 1897.

Fig. 1.

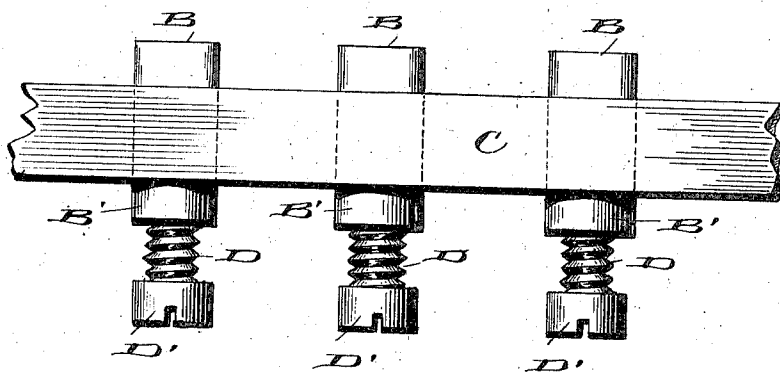


Fig. 2.

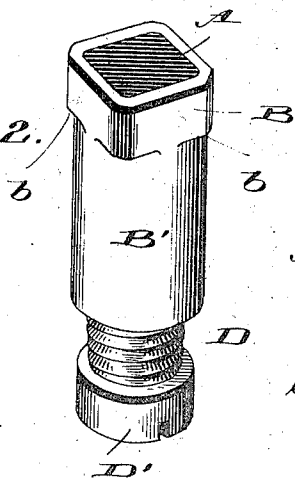


Fig. 4.

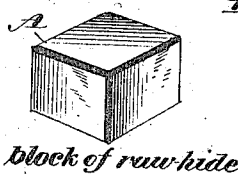
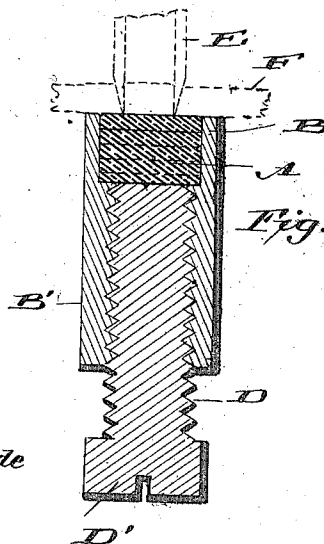


Fig. 3.



Witnesses:
L. C. Mills
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Att'y.

UNITED STATES PATENT OFFICE.

FRANK L. HARMON, OF BEVERLY, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO RUFUS H. WOODBURY, OF SAME PLACE.

DIE-BLOCK.

SPECIFICATION forming part of Letters Patent No. 579,537, dated March 23, 1897.

Application filed March 28, 1895. Serial No. 543,535. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. HARMON, a citizen of the United States, residing at Beverly, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Die-Blocks, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a bed, pad, or block for use in connection with cutting or punching dies, and it is intended to take the place of beds, plates, or blocks formed or consisting of wood, lead, leather, and other substances which have hitherto been employed, the principal object of the invention being to provide a bed, plate, or block which will expand by reason of the heat produced by the cutting-tool in entering the bed, plate, or block and by passing through the material operated upon by the cutting-tool.

It is well known that in paper-cutters, gang-punches, and single punches it is customary to employ a bed, plate, or block of wood, lead, leather, and possibly in some instances rubber, upon which the material to be cut or punched is placed so that as the cutter or punch passes completely through the material it will enter slightly the bed, plate, or block, so as to produce a clean cut completely through the material and that without injuring the edge of the cutter by reason of the relative softness or pliability of the bed, plate, or block. It is also well-known that the above-mentioned beds, plates, and blocks soon become worn out, cut up, or otherwise injured and have to be frequently replaced, and in the class of punches or cutters sometimes designated as "gang-punches," meaning an assemblage or series of cutters so arranged and operating that they always strike the bed, plate, or block in the same place in successive cutting or punching operations, the wearing away is much more rapid than where the punch or cutter may be brought to strike the bed, plate, or block at different points successively. In all of the blocks, beds, or plates heretofore used the natural elasticity of the material of which the block is made acts in a slight degree in wood and leather blocks to close the opening formed by a punch or a cutter used in connection therewith, while in rubber blocks the

natural elasticity of the material causes it to contract and close a cut or opening produced by a punch or cutter therein by reason of the greater elasticity of this material as compared with leather and wood. Lead blocks are usually employed with punches for working tin and other similar cheap metal, and they soon become so rough that the punch will not make a clean cut.

In my invention instead of relying upon the natural elasticity and contraction of the material of a bed, plate, or block I employ a material which by the heat of the cutting or punching tool evolved by reason of the friction thereof against the material operated upon will be caused to expand and close the opening formed by the cutter or punch therein. I have discovered by experiment that rawhide possesses to a practical degree this characteristic of expansion by heat of the tool, and if used in beds, plates, or blocks of sufficient bulk or area relative to the diameter or other dimension of the tool employed it alone and unencompassed will serve the function which I have stated, but where it is desirable or necessary to restrict the area of the bed, plate, or block then this characteristic is enhanced by confining the bed, plate, or block at its boundaries or sides, as hereinafter described.

It has also been proposed to employ a plurality of rawhide disks on a shaft confined between washers or plates and nuts; but these have been so arranged that the cutters contacted with the peripheries of the disks, which were unconfined, and with the grain or fiber crosswise, and the die-blocks were short-lived. I deem it of great importance that the disks or layers of rawhide be confined at their peripheries and so arranged that the cutters contact with the flat faces of the disks and in line with the fiber of the rawhide, whereby the advantages above set forth are attained.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of a plurality or series of my improved beds, plates, or blocks set in a common support. Fig. 2 is an enlarged perspective view of one of the blocks, beds, or plates. Fig. 3 is a substantially central vertical section through the same with the cutter and the material to be acted upon thereby indicated by dotted lines. Fig. 4 is a perspective detail of one of the blocks of rawhide.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the bed, plate, or block, which is of a material which will expand by heat evolved by the cutting-tool, and for this purpose I prefer to employ rawhide, which may be in a single block, as indicated in Fig. 4, or of a plurality of disks or plugs, as indicated by dotted lines in Fig. 3. In the present instance I have shown this block or bed, whether composed of a single piece or of a plurality of pieces or disks, as confined within or encompassed by a jacket or a socket B, which may be supported in position in any suitable manner, as, for instance, in a bed, plate, or support C, as shown in Fig. 1, where are illustrated a plurality of my improved beds, plates, or blocks. A suitable provision may be made for adjustment to compensate for wear, which, however, by the employment of the rawhide is very small compared with that when leather, wood, or lead is employed. In this instance I have shown a screw D as the means for accomplishing this end. This screw is adapted to engage the internally-threaded extension B' of the socket, in which the rawhide or other material is confined, and this screw is provided with a head D', having suitable provision for the engagement or reception of a suitable tool by which it may be turned to adjust the block A outward. The upper end of this screw bears against and forms a rest or bearing for the block or bed A, as seen best in Fig. 3.

At the junction of the socket and the extension there are provided the shoulders b, which serve to rest upon the top of the bed, plate, or support C, while the tubular extension passes therethrough, and thus the strain and pressure are borne by the shoulders and bed, plate, or support.

In Fig. 3, E designates the cutter, and F the material supported upon the die block, bed, or plate, and the tool is shown as having passed through such material and its sharp edge imbedded in the block A.

I have found out by experiment that raw-

hide when confined so that it cannot swell or enlarge that the blow or blows of the percussion-cutter produce heat, and the heat thus produced has a tendency to cause the rawhide to swell, but the confinement thereof prevents its swelling, and therefore the heat caused by the blows in rapid succession, which, were the rawhide unconfined, would cause it to swell, causes the cut made therein by the cutter to close as fast as it is cut open. This action is dissimilar to the springing back of a material like rubber, but closely resembles the expansion and contraction by heat in metal. Thus the life of the block is very materially lengthened, and much better work is produced, as I am enabled to use a sharp cutter, the point or cutting edge not being dulled by its contact with the rawhide. Repeated blows in the same place will not produce and leave an opening, as in wood or leather.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. As an improved article of manufacture for use in a machine employing a punch and a punch-block, the combination of a hollow post supported by a bed, an adjusting-screw threaded into the post, and a punch-block dropped into the hollow of the post and seated upon the end of the adjusting-screw; all substantially as and for the purpose specified.

2. As an improved article of manufacture for use in a machine employing a punch in a punch-block, the combination of a hollow post supported by a bed, an adjusting-screw threaded into the post, and a punch-block composed of a plurality of disks of rawhide arranged in the hollow of the post and seated upon the end of the adjusting-screw, whereby they are entirely encompassed by the metal of the post; substantially as and for the purpose specified.

3. As an improved article of manufacture, the combination of a hollow post independent of its bed, an adjusting-screw threaded into the post, and a punch-block inserted into the hollow of the post and seated upon the end of said adjusting-screw; substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK L. HARMON.

Witnesses:

SAMUEL H. STONE,
SETH T. THACHER, Jr.