

(No Model.)

B. RING & B. W. STICKNEY.
PROCESS OF RENEWING MATRICES.

No. 604,123.

Patented May 17, 1898.

Fig. 1

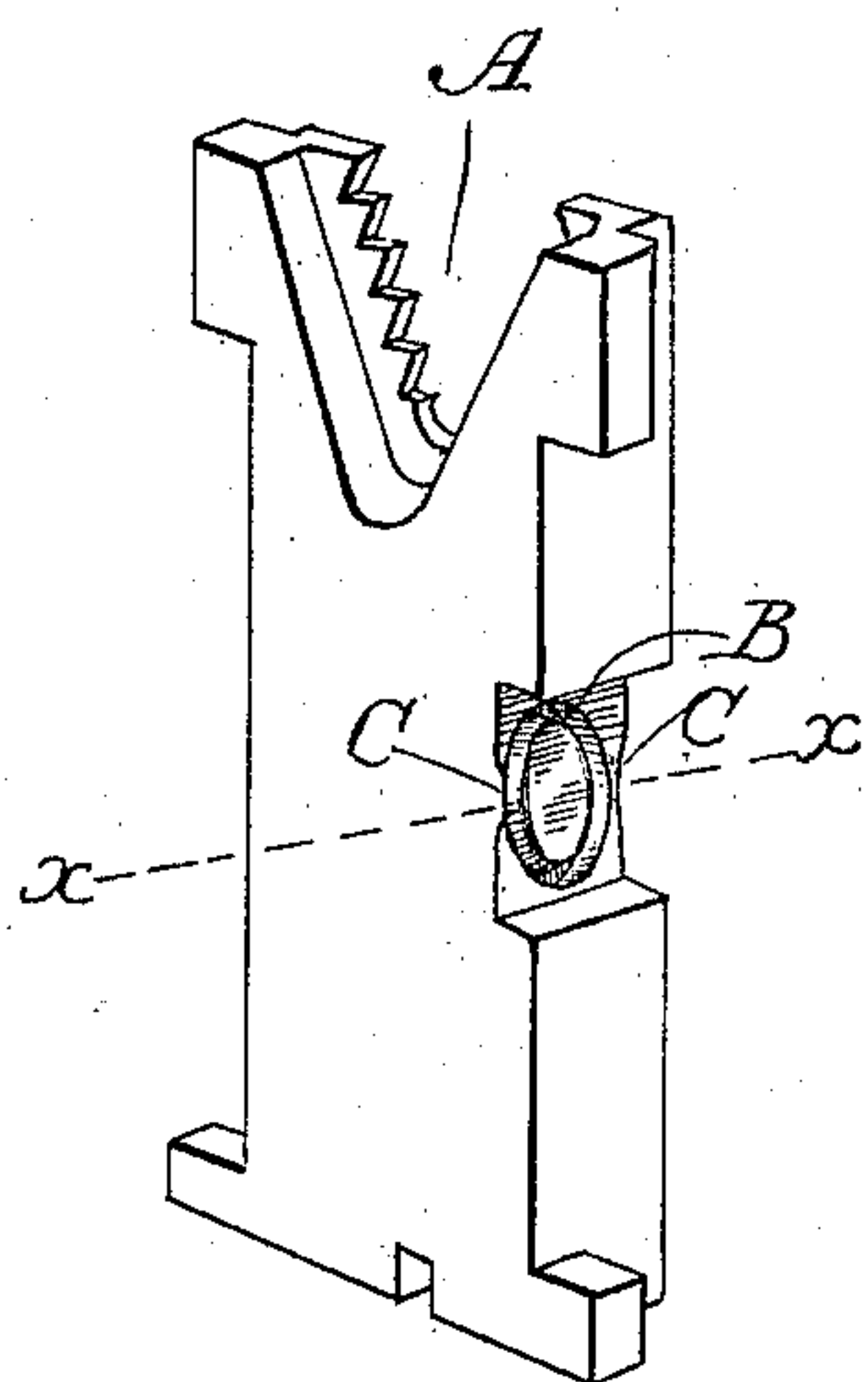


Fig. 2

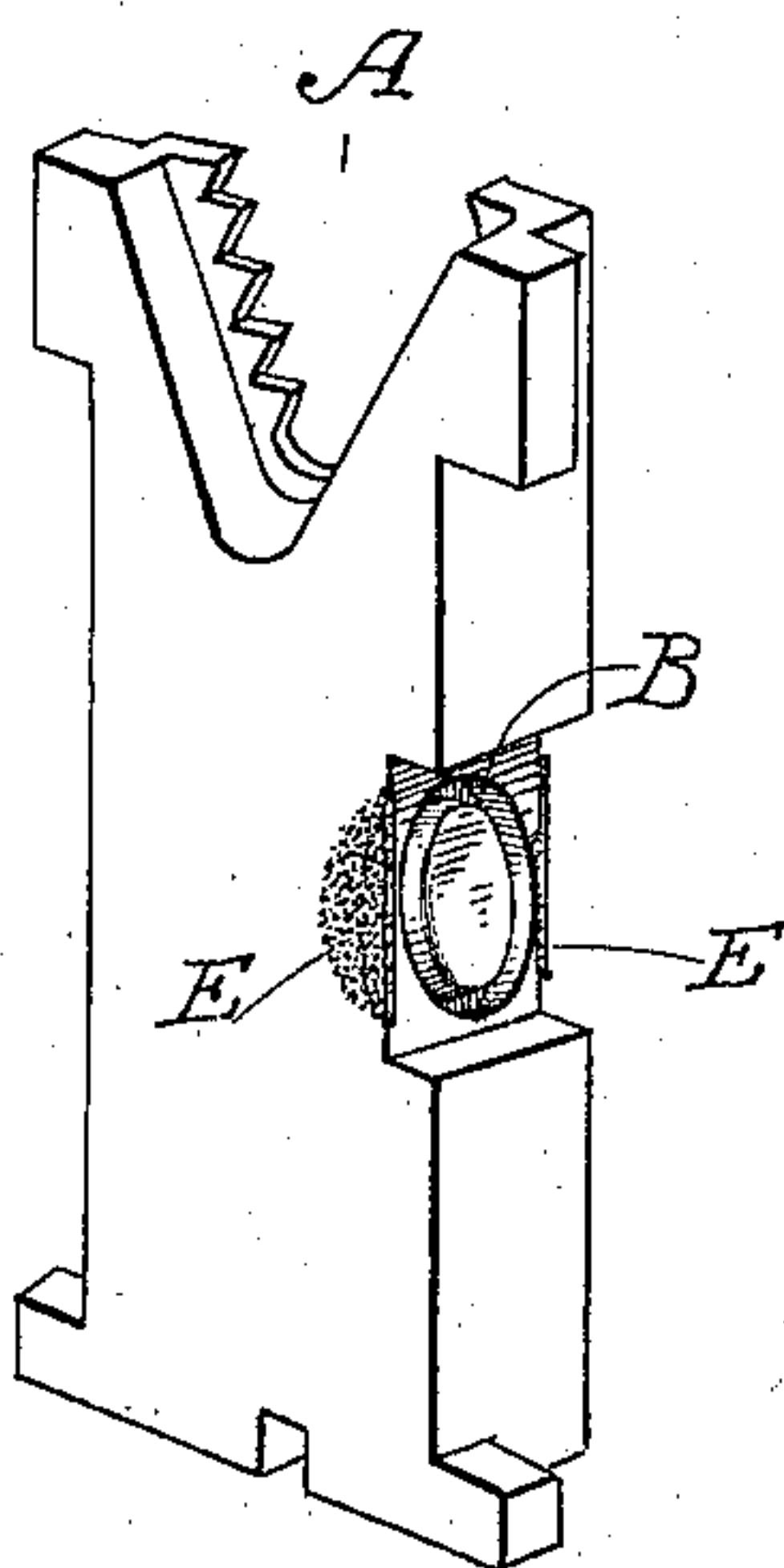


Fig. 3

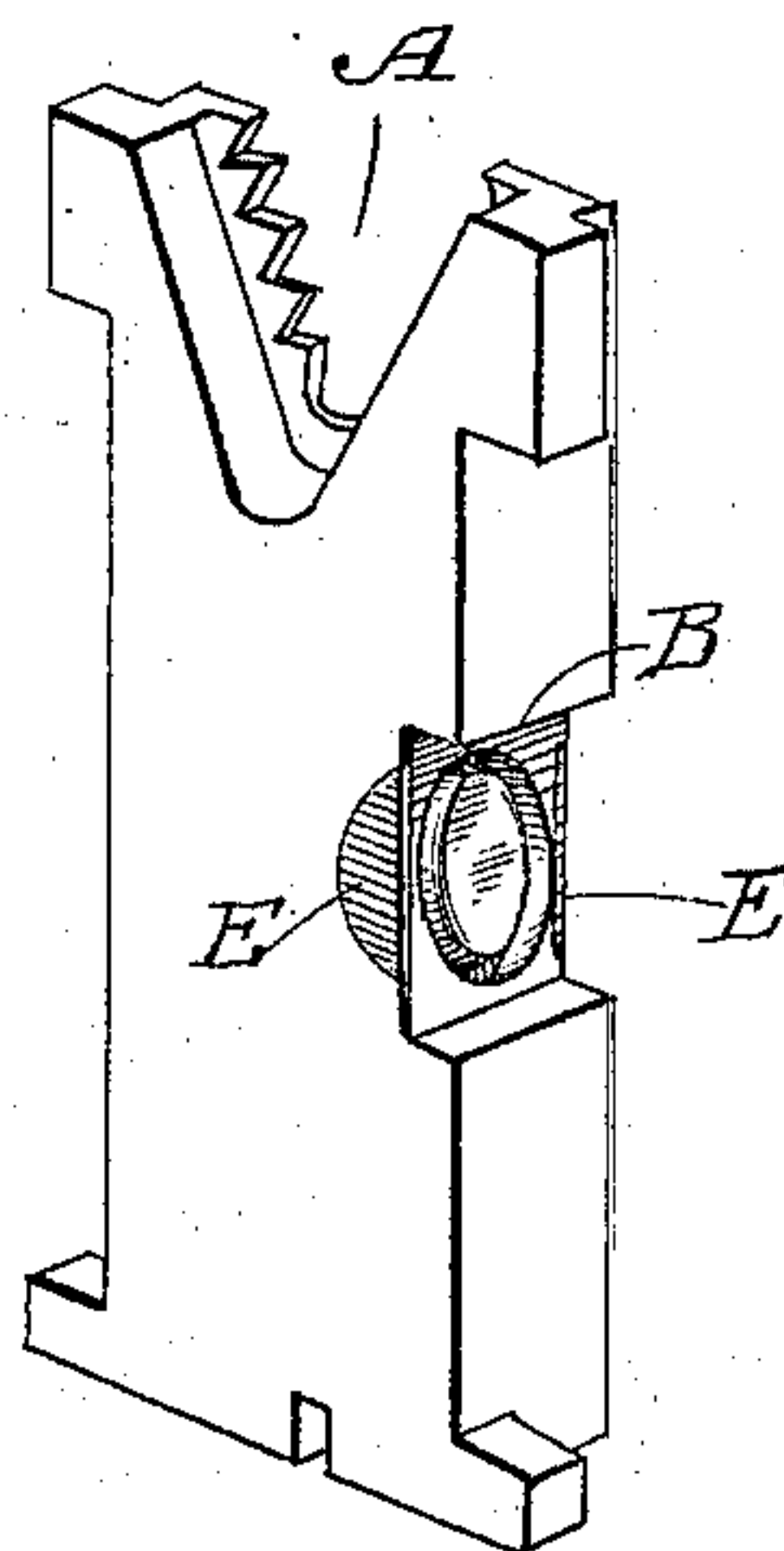


Fig. 4

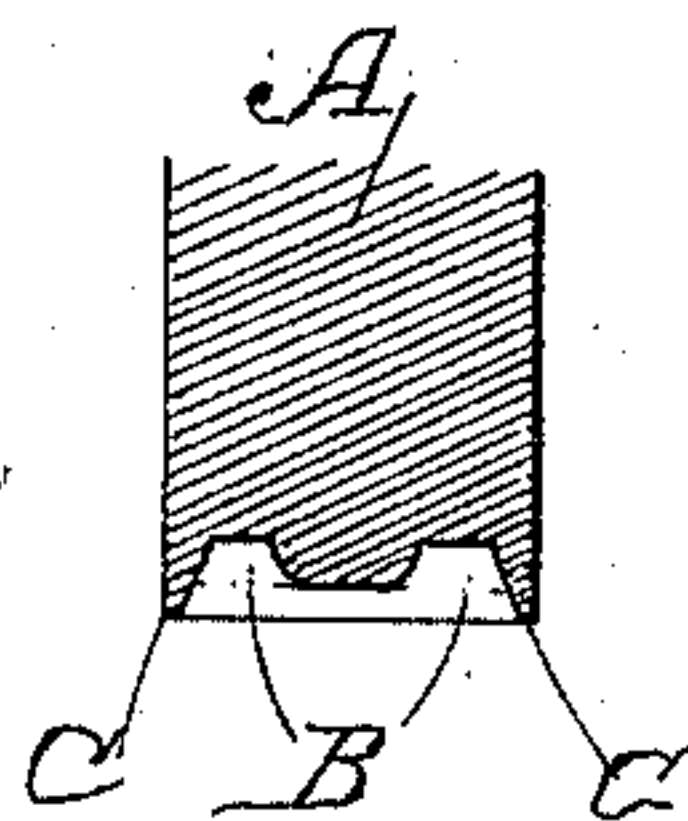


Fig. 5

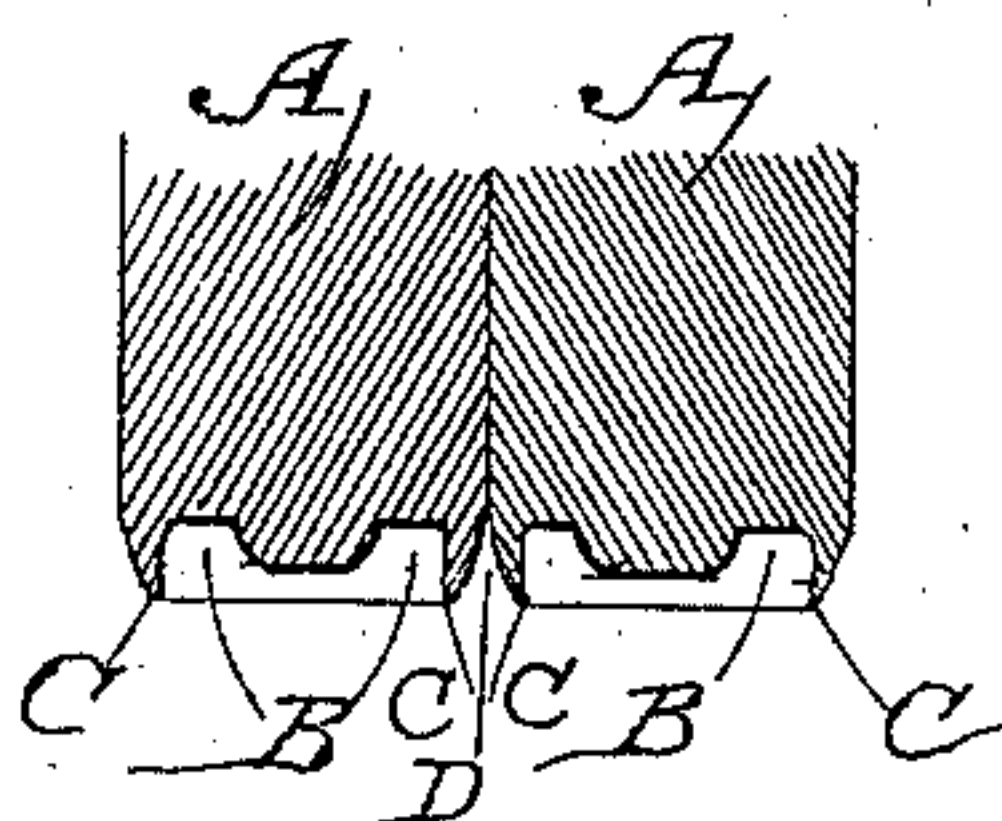


Fig. 6

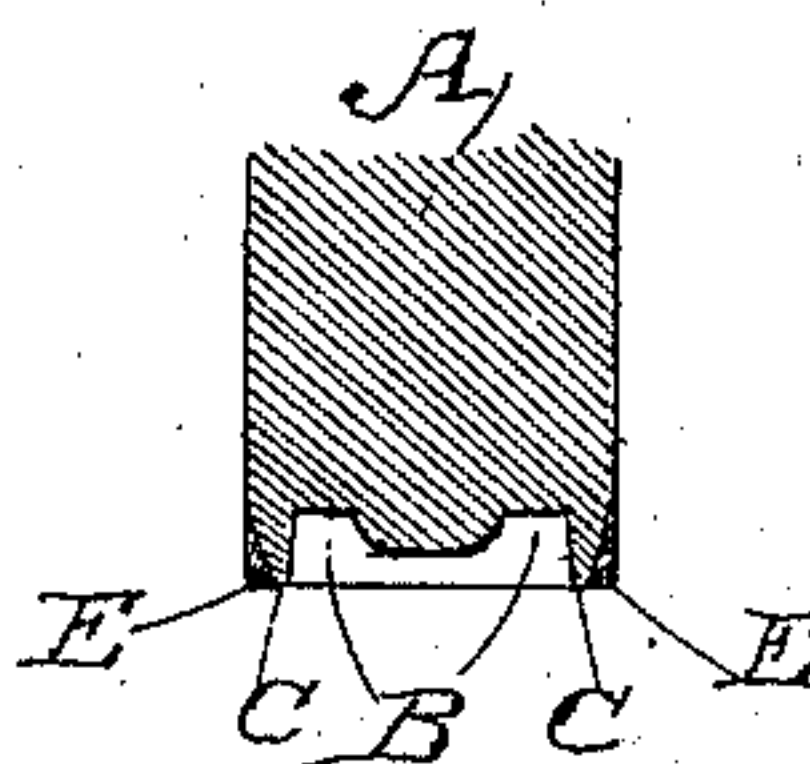


Fig. 7

DAMAGED MATRICES

Witnesses
J. A. Brayless
W. R. Boone

Byron Ring and
Benjamin W. Stickney
Inventors

By their Attorney Jno. L. Boone

UNITED STATES PATENT OFFICE.

BYRON RING, OF SAN FRANCISCO, AND BENJAMIN W. STICKNEY, OF
OAKLAND, CALIFORNIA.

PROCESS OF RENEWING MATRICES.

SPECIFICATION forming part of Letters Patent No. 604,123, dated May 17, 1898.

Application filed April 14, 1897. Serial No. 632,164. (No model.)

To all whom it may concern:

Be it known that we, BYRON RING, residing in the city and county of San Francisco, and BENJAMIN W. STICKNEY, residing in Oakland, in the county of Alameda, State of California, citizens of the United States, have invented certain new and useful Improvements in Processes for Renewing Matrices for Linotype-Machines; and we do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

Our invention relates to a novel mode, method, or process for renewing and repairing matrices used in linotype setting and casting machines after they have been damaged or rendered unfit for use. The matrices used in this class of machines consist of metal plates each of which has a matrix or letter-mold formed in its edge, and these plates are placed side by side, so that the matrices are in the same line, and the molten metal is then forced into the matrices to form letters upon the metal slug from which printing is done. In the manufacture of these plates a thin wall is left on each side of the matrix-face, and this wall is liable to become bent inward, in which case the molten metal enters between the adjacent walls of two adjoining plates and forms fins or burs on the linotype slug, which mar the print which is taken therefrom. In such cases the plate and matrix thus rendered defective are thrown away and discarded as useless.

The object of our invention is to provide a simple and effective mode, method, or process by which such damaged and discarded plates may be utilized by renewing the matrix-walls as often as they become damaged and injured.

In the accompanying drawings, Figure 1 is a perspective view of a damaged matrix, showing the thin walls inclosing the letter-mold bent out of line. Fig. 2 is a view of a matrix, showing the manner of repairing the walls by our invention. Fig. 3 shows a finished matrix. Fig. 4 is a horizontal section on the line *x* of Fig. 1 of a matrix before being damaged. Fig. 5 is a horizontal section of two matrix-plates, showing the thin walls

pressed out of line. Fig. 6 shows the walls after being repaired by our process. Fig. 7 shows the printed result of the damaged matrix.

Let A represent a matrix-plate carrying the matrix of the letter "O," such as is used in line-type-casting machines. It consists of a metallic plate having a notch or small section cut away from its edge, and in the base of this removed section the matrix of the letter, figure, or character is formed by impression, leaving walls of metal surrounding the outer edges of the matrix. These walls vary in thickness, according to the character of the figure or letter they carry. For instance, at the widest part of the letter the walls are necessarily thinner than at the narrower parts, and in some cases, especially so with certain letters, the wall at the point opposite their widest part is quite thin. In the drawings the plate is represented as having the matrix of the letter "O," which is marked B. The matrix-face B of the letter "O" is punched upon the base of a removed section of the plate, the punching of the matrix-letter leaving thin walls C, which are flush with the side of the matrix, as shown in Fig. 4. The upper edges of these walls C being thin are liable to injury by being pressed inward, as shown in Figs. 1 and 5, and when in that condition they cause burs or fins to be cast upon the metal slug between the letters. When an impression is taken from this slug, ragged lines resulting from these fins or burs appear between the letters on the printed sheet, thereby destroying the clearness and neatness of the print, as shown in Fig. 7. When a number of matrices in this condition render the print obtained from them unsightly, the entire font or magazine of matrices is thrown to one side as useless and waste material.

The thin wall C is bent or crushed inward from various causes. Frequently a small particle of dust, dirt, or metal adheres to the outside of the wall, so that when the wedge-shaped space-bands which separate the words in the line are forced upward to tighten the matrices the particle of dust causes a minute opening to be made between the walls of the adjoining matrices, and into this small opening the molten metal is forced. From this

starting-point the wall is bent or "caved in" (so called by machine-operators) more and more with each additional cast. This damaged wall of the matrix coming into conjunction with a perfect matrix when it again drops into the line causes the wall of the perfect plate to be slightly bent, and it in turn carries on the work of destruction until in a short time the whole or a greater portion of the front of matrices must be discarded as useless and waste material, as above stated.

In renewing the bent wall C of the matrix we dip the matrix to a depth sufficient to fully cover the matrix-face and damaged wall in an insulating compound—such as a molten compound of beeswax and rosin, asphaltum, varnish, or other similar material—which will coat and cover the dipped portion of the plate. We then place the matrix in a specially-constructed milling-machine and cut away a thin shaving from the exterior of the wall C on each side of the matrix to a sufficient depth to remove the insulating-coating and expose a clean bright surface upon which to deposit metal by the electrodepositing process. The walls being somewhat tapering the thinnest portion is at the outer edge, which is where the damage usually occurs. It is only necessary in removing the metal to cut deep enough to give a surface to plate upon, which is usually a mere shaving. The insulated portion of the matrix is then placed in a plating solution in an electroplating-tank, so that the solution in the tank covers the upper line of the exposed metal caused by the milling-machine. If the plate is entirely covered with the insulating substance, it can be wholly immersed in the solution and the deposition of metal will only take place on the surface from which the metal was removed, thereby replacing by electrodeposit the removed portion of the wall; but in practice it is only necessary to cover enough of the plate with the insulating substance to extend it beyond the removed portion of the plate, in which case the coated portion only need be im-

mersed. The deposited metal E will be somewhat irregular and may project beyond the side of the main plate. To remedy this, the matrix is submitted to the operation of a finishing-machine, by which the superfluous metal is dressed away until a perfectly level and smooth surface is presented and the edges of the wall reduced to proper dimensions, as shown in Fig. 3, thus leaving the plate with a sufficient thickness of metal to permit of its being dressed down to the required thickness.

In order to clearly illustrate the condition of the bent walls of matrices, Fig. 5 is given with two damaged matrices placed side by side, showing the opening D, into which the metal is forced, thereby creating the burs or fins which our process of renewal completely overcomes.

This process and operation can be repeated as often as the plate becomes damaged, thus saving the expense of new plates. It also gives a better matrix, because we can deposit a harder metal than the material of the plate.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

The process of renewing the walls of matrices of line-type setting and casting machines, consisting in first coating the matrix-plate with a non-conducting substance; secondly, removing a section of the plate on the side of the matrix outside the wall; thirdly, immersing the plate in a metallic solution and depositing metal in place of the removed portion; and lastly, trimming and reducing the deposited metal to an even surface with the wall of the plate.

In testimony whereof we have hereunto signed our names in the presence of two witnesses.

BYRON RING.
BENJAMIN W. STICKNEY.

In presence of—

W. R. BOONE,
CHAS. J. ARMBRUSTER.