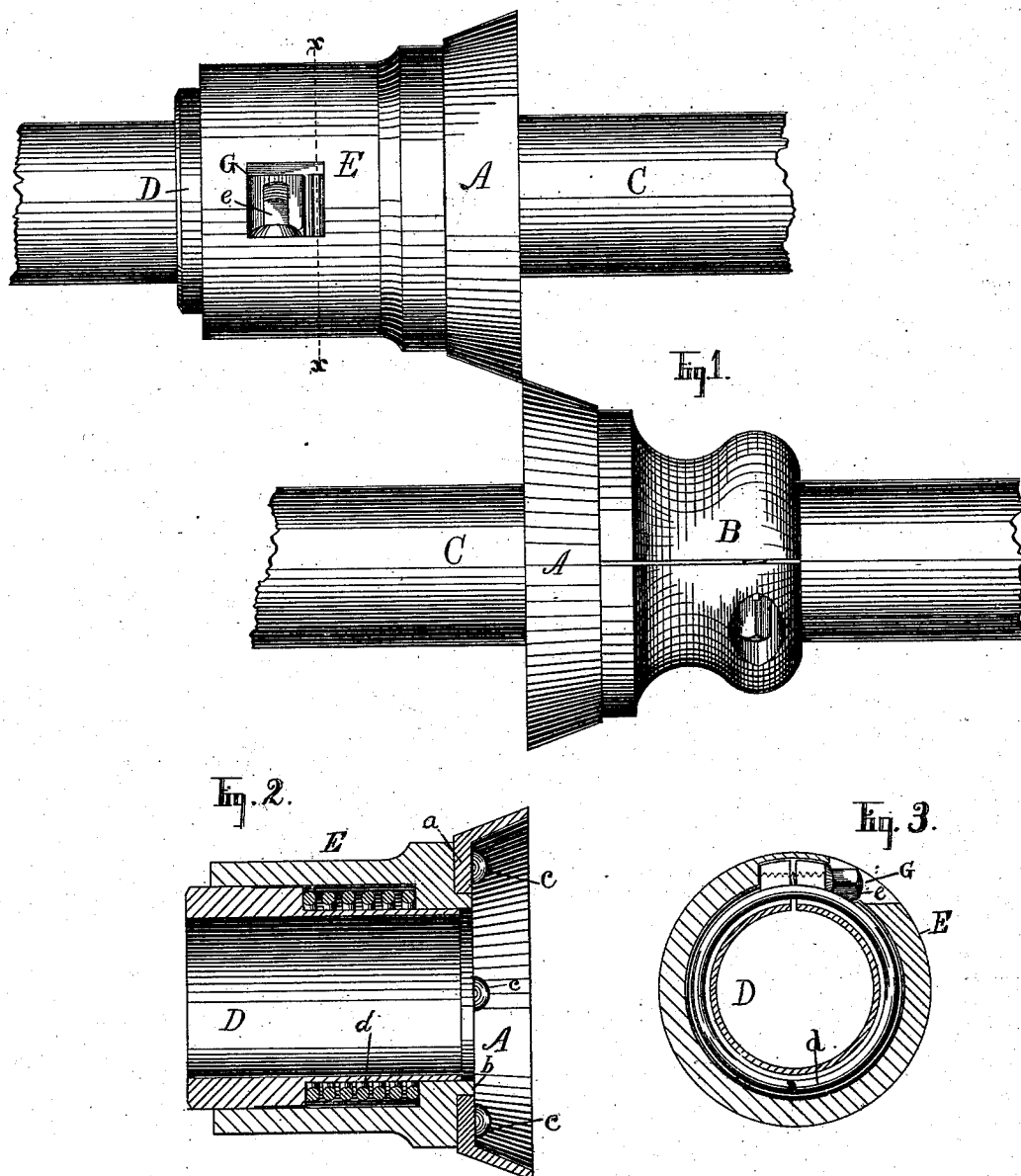


R. BINNS.
Machine for Trimming and Slitting Paper.
No. 225,046. Patented Mar. 2, 1880.



Witnesses.
W. B. Thomson.
J. Edwards.

Inventor.
Robert Binns.
By James Shepard Atty.

UNITED STATES PATENT OFFICE.

ROBERT BINNS, OF SOUTH WINDHAM, CONNECTICUT.

MACHINE FOR TRIMMING AND SLITTING PAPER.

SPECIFICATION forming part of Letters Patent No. 225,046, dated March 2, 1880.

Application filed August 25, 1879.

To all whom it may concern:

Be it known that I, ROBERT BINNS, of South Windham, in the county of Windham and State of Connecticut, have invented certain
5 new and useful Improvements in Machines for Trimming and Slitting Paper, of which the following is a specification.

My invention consists, first, of the cutter of peculiar form, hereinafter described and
10 claimed; second, of the peculiar construction and combination of the parts forming the hub of the spring-actuated cutter; and, third, making the particular surface of the particular-shaped cutters harder than the rest when oper-
15 ating in a particular manner, all as hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of a pair of cutters which embody my invention. Fig. 2 is a longitudinal
20 section of one of said cutters and its hub; and Fig. 3 is a transverse section of said hub on line *x x* of Fig. 1.

A A designate the cutters, the sides of which are flaring, somewhat after the form of the
25 sides of a flaring dish, whereby I call the sides "dish-shaped." I connect these sides with a solid bottom, *a*, (see Fig. 2,) thereby making the cutters not only dish-shaped, but saucer-shaped; but so far as part of my invention is
30 concerned the bottom *a* may be omitted. In the middle of the bottom *a* I make a circular opening concentric with the outer edge of the cutter, and of a size which will fit the tenon on the hubs of paper-slitters in common use.
35 The tenon *b*, Fig. 2, is such a tenon, and the cutter, after being slipped upon said tenon, with the broad annular seat on the back side of the cutter resting against the shoulder of the slitter-hub, is secured in place by screws
40 *c c* passing through the bottom *a* of the cutter into the body of the hub, the head of said screws resting upon the broad annular seat on the flat side of the bottom *a*. Both cutters are of the same form and fastened in the same
45 way.

B designates one of the hubs as heretofore made, the same being provided with a tenon like the tenon *b*, Fig. 2.

I consider it unnecessary to show or describe
50 the frame of the machine, as the same is well known and no part of my invention.

The cutters are to be mounted upon the shafts C C of said machine in the ordinary manner, except in the peculiar construction of the spring-hub. It is customary to mount one
55 cutter so as to constantly bear against its fellow cutter under the influence of a spring. I mount the spring *d*, Fig. 3, which actuates the yielding cutter, on an incased hub or collar, D, the outer end of which is split and pro-
60 vided with a set-screw or clamping-screw, *e*, whereby the hub may be clamped to the shaft C in any desired position in a well-known manner. The inner end of this hub or collar D, I reduce in size, so as to receive the spring
65 *d* thereon and not have said spring project beyond the greatest diameter of said collar.

The hub proper, E, is provided with tenon *b*, before described, and its inside diameter at the cutter end is such as to receive and fit the re-
70 duced portion of the collar D, and the diameter at its opposite end is such as to receive and fit the greatest diameter of said collar, the distance between the respective shoulders on the collar D and hub E forming a spring-chamber,
75 as shown in Fig. 2, thereby concealing the spring and preventing any damage from being done by anything catching into said spring. After putting the parts in place, as shown in
80 Fig. 2, the screw *e* is inserted through the opening G in the hub, which also permits the use of a thimble-wrench to adjust the collar in place.

When the hub is not mounted on the shaft, the head of the screw *e* comes in contact with
85 the side wall of the opening G, and temporarily holds the collar, spring, and hub together, so that they will not be disorganized in transportation. This hub, with its concealed spring,
90 is applicable to cutter or slitter blades of other forms, as well as to the particular cutters herein shown and described.

The sides of the cutters are of the form shown in the patent to J. Hatch, No. 62,486,
95 February 26, 1867, which are hereby disclaimed; but my cutters differ from said patented cutters by combining the bottom *a* with the said shaped sides, whereby they are adapted to the hubs of slitting-machines now in
100 common use, instead of necessitating the use of a hub of special construction.

The cutters in said patent were of steel and

hardened substantially the same throughout the entire thickness of their edges. I have found by making them the hardest on the outside flaring surface that the end and inside corner, which forms the face at right angles to the cutter, and which, in use, is continually in frictional contact with a like face on the fellow cutter, would wear off faster than the outside corner, which, being the hardest as well as the highest or most prominent point, will always remain full and sharp, thereby making the cutters practically self-sharpening and always cutting neatly with but little or no dust.

It can be readily seen that, if the entire thickness of the cutters at their meeting-edges or right-angular faces were of a uniform hardness, the outside corner must be first to wear off, because the most prominent and subject to greatest wear, while the larger surface of the edge would not be worn away so rapidly, thereby soon requiring sharpening; but by making the cutters hard upon the outside surface of the flaring sides and comparatively soft upon the right-angular faces, which are in continuous contact, the wear is very different, and tends to keep the cutters sharp instead of dulling them.

The cutters may be made of any suitable metal, hardened so as to make the surface of the flaring outside the hardest and accomplish the self-sharpening result. I prefer to use cast malleable iron as best adapted for said use, and they may be hardened in the manner described by any ordinary process—as, for instance, case-hardened with burnt leather, &c.—by protecting the parts which are to be the softest from contact with the leather by sealing tightly with fire-clay, plaster-of-paris, or other cement.

I am aware that a prior patent for improvements in knives for flock-cutting machines describes cutters which have been case-hardened on the surface and a part of the said hardened surface removed, thereby leaving one part soft and another hard, for the purpose of making the cutters self-sharpening. These cutters, however, were substantially straight blades, set edgewise side by side in the periphery of a tapering drum, and acting upon companion blades which surround said drum.

It is evident that these cutters, which I hereby disclaim, could not be used for slitting paper or other material into strips.

The making of one surface harder than another can be of no practical utility in slitter-blades, unless the hard surface is that particular surface of the particular-shaped cutters as hereinafter specified in claim 4.

I claim as my invention—

1. The cutters A A, having flaring dish-shaped sides, the highest outside corners of which constitute the cutting-edge, and said sides connected to a solid bottom, *a*, provided with a central opening adapted to fit and receive the hub of an ordinary paper-slitter, and having also the broad flat annular seat on both sides of the bottom, that on one side resting against the shoulder on the slitter-hub, and that on the other side acting as seats for the fastening-screws, substantially as described, and for the purpose specified.

2. The divided hub or collar D, having set-screw *e* toward its outer end, and the reduced neck at its inner end, in combination with the spring *d*, the hub proper, E, having tenon *b* for receiving the cutter, and the inside diameter of which hub for the main portion of its length, is such as to properly fit the greatest diameter of the hub or collar D, while the inside diameter at the inner end is such as to fit the reduced neck of the collar D, substantially as described, and for the purpose specified.

3. The divided hub or collar D, having set-screw *e*, in combination with the spring *d* and hub E, which incloses the collar, and which also is provided with the opening G, which furnishes access to the set-screw, and the outer wall of which opening engages the head of said screw under certain conditions, substantially as described, and for the purpose set forth.

4. The cutters A A, having dish-shaped peripheral sides, the edges of which form faces at right angles to the axis on which said cutters rotate, the same being placed on a parallel shaft with said faces, meeting each other between said shafts, and having the outside flaring surface made harder than the continually-meeting right-angular faces, substantially as described, and for the purpose specified.

ROBERT BINNS.

Witnesses:

SETH S. COLLINS,
HUBER CLARK.