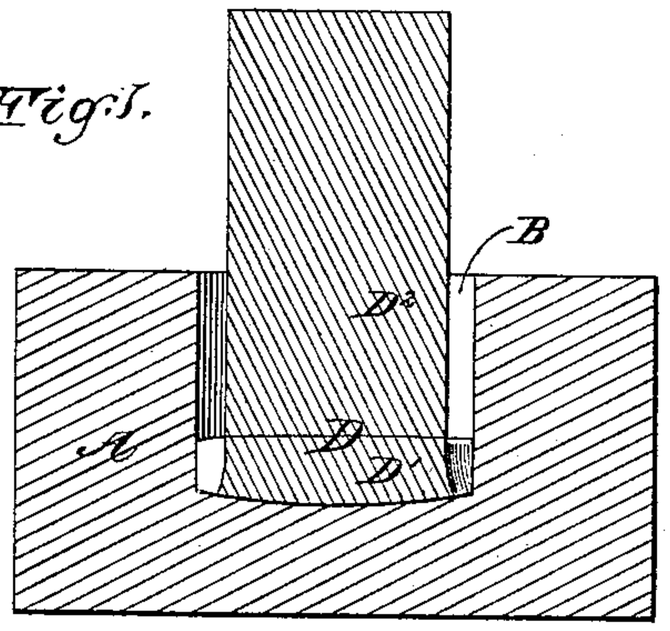
(No Model.)

J. ROBERTSON

DIE FOR MAKING LEAD WIRE, &c.

No. 389,321. Patented Sept. 11, 1888.

Fig. 1.



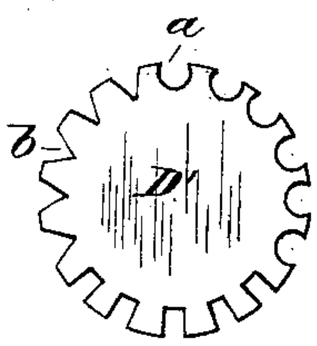
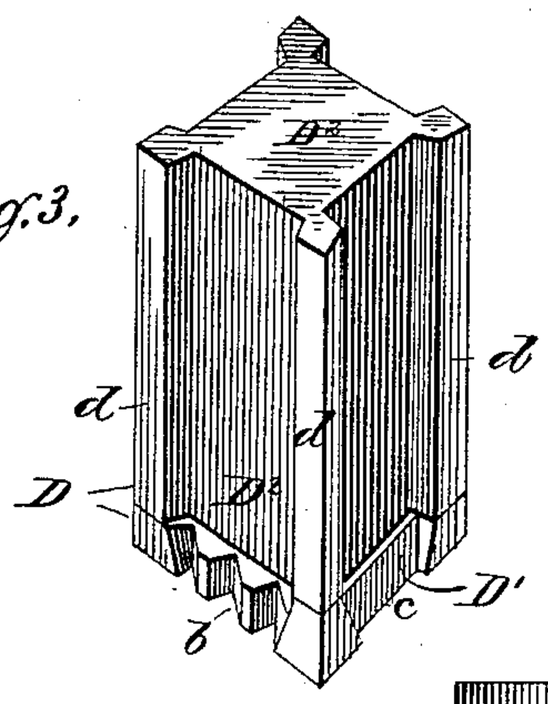


Fig. 2.

Fig. 3.



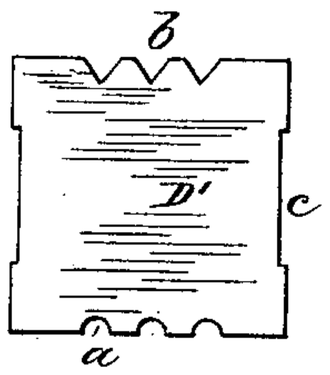
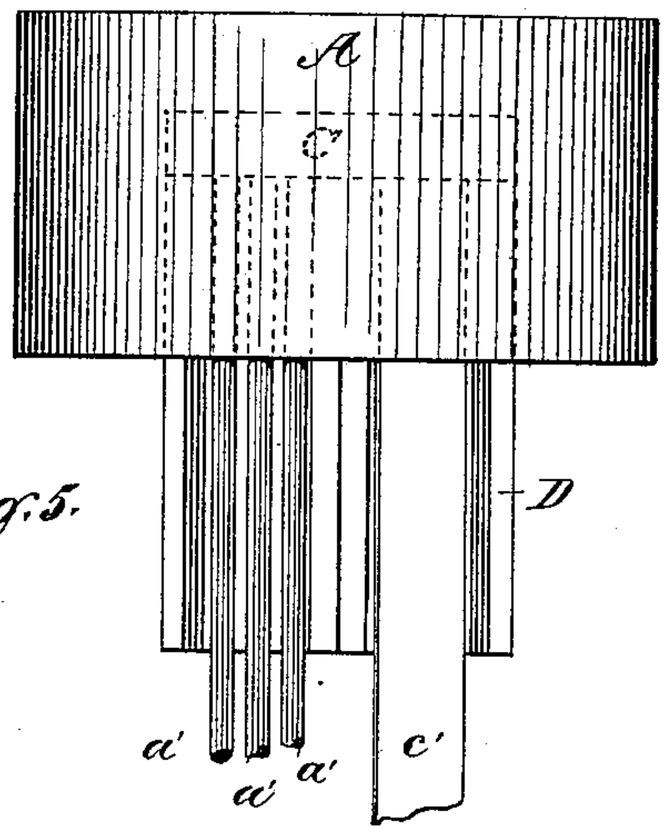


Fig. 4.

Fig. 5.



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JOHN ROBERTSON, OF BROOKLYN, NEW YORK.

DIE FOR MAKING LEAD WIRE, &c.

SPECIFICATION forming part of Letters Patent No. 389,321, dated September 11, 1888.

Application filed January 11, 1888. Serial No. 260,380. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, of the city of Brooklyn, in the county of Kings and State of New York, and a citizen of the United States of America, have invented a new and useful improvement in dies especially adapted for the formation of lead or solder wire or ribbon or analogous articles, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a central vertical sectional view of the male and female parts of a die to be used for forming lead or solder wire, which said die embodies my invention. Fig. 2 is an under face view of the male part of the said die. Fig. 3 is a perspective view of the male part of such a die to be used for forming wire and ribbon of soft metal. Fig. 4 is an under face view of the same; and Fig. 5 is an elevation of the whole die, a part of which is shown in Figs. 3 and 4, showing, also, the product issuing therefrom, and the mass of the material from which said product is formed, certain portions of the apparatus and product being shown in dotted lines.

Dies for forming articles of almost every conceivable form have long been known and used, and dies for forming lead wires as well; but they have been constructed and arranged so that the product issued through the center of the bottom of the female die; but this method is objectionable from the fact that it requires great pressure, which objection and others are overcome in my die by reason of the fact that the opening for the egress of the product is placed between one member of the die (which is movable relatively to the other member) and the other member, which may also be movable or otherwise, as desired, and the material is led out at the same side which the plunger enters and in a direction away from the bottom of the recess in the other member of the die. This arrangement also gives me greater space for the arrangement of a number of passages through which the product may be led out than any other form of die of the same dimensions.

As shown in the drawings, A is the female part of the die, which consists of a block of metal or other suitable material, and which is usually to be rigidly secured or supported in an appropriate position. It has in it a recess, B, preferably central and entirely closed at the bottom for the reception of the material, C, (shown in Fig. 5,) from which the product is to be formed.

D is the other member of the die, and, as shown, its lower exterior horizontal extremities are constructed to closely fit the opening B; but the perimeter of D has cut or otherwise formed in it passages of the form desired for one, two, or three sides of the product desired. At *a* the passage is for the round side of a wire, at *b* it is constructed to form two sides of a wire triangular in cross-section, and at *c* to form one side and two edges of a ribbon, the remaining side of the passage for the product in each instance being formed by the interior wall of the other member of the die. Of course these passages might be formed by cutting indentations in the interior walls of A, leading from the bottom to the top of B, and constructing D so as to fit closely against the portions of said interior walls not cut away, its surface adjoining the grooves or passages in said interior walls being shaped to form only one side of the required product; or the grooves or passages might be cut partially in each member of the die; but I prefer to arrange them in D, as shown. So, too, I prefer to secure A rigidly and to move D therein; but a substantially similar result would be attained by securing D and moving A toward it, or moving both parts toward each other.

A short distance from its lower face I cut away D, so as to leave more space between it and the interior walls of A than is made by the passages mentioned, that the formed product may not choke said space in its exit. The best way to accomplish this is to construct D in two parts, D′ and D², the first a steel plate, D′, of substantially the same size as the recess B, and provided with the required grooves or indentations *a b c*, &c.; the second, a stem or plunger, D², of less diameter than D′, and to the end of which D′ should be secured.

To insure smooth working of the parts, it is advisable to leave or form D′ and also D² of such form and size that at several points they shall closely fit the interior walls of A for the entire longitudinal distance which D can be in-

serted in B, thus forming guides, as shown at *d*, Fig. 3.

The arrangement of the passages as shown and described enables me to provide great strength in the central part of D, where it is needed, by making said part solid, to produce the product with less pressure by permitting the material to flow out at the points where it naturally seeks egress when pressure is applied, and to provide a greater number of passages than in other dies of an equal size.

The operation is as follows: Material in bulk having been placed in the recess B of the part A, the member D is inserted in the open end of said recess and pressure applied to force A and D together, when the material, C, seeks to escape and finds exit through *a b c*, the passages between the exterior walls of D′ and the interior walls of A assuming, of course, in passing the form of said passages, and is then led off and coiled up, to be used as desired.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, in a die, of two members, one a base-block provided with a recess, substantially as set forth, and the other a plunger whose cross-areas are each less than the area of the recess in the base-block for a distance greater than the depth of insertion of said plunger in said recess in the base-block, the interior walls of said recess and the exterior walls of said plunger being shaped to form the desired product and arranged substantially as set forth, whereby there will remain one or more passages between them, through which the product may at all times pass entirely out of the die, substantially as set forth.

2. A die composed of a base block provided with a recess, substantially as set forth, and a plunger which, when inserted into said recess, will touch the walls thereof at two or more points, and each cross-area of which for a distance greater than the depth of insertion of said plunger in said recess in the base-block is less than the area of said recess, the interior walls of said recess and the exterior walls of said plunger shaped to form the product desired and arranged as set forth, whereby there will remain one or more passages between them, through which the product may at all times pass entirely out of the die, substantially as set forth.

3. A die composed of a base-block provided with a recess, substantially as set forth, and a plunger which, when inserted into said recess, will touch the walls thereof at three or more points, and each cross-area of which for a distance greater than the depth of insertion of said plunger in said recess in the base-block is less than the area of said recess, the interior walls of said recess and the exterior walls of said plunger shaped to form the product desired and arranged as set forth, whereby there will remain one or more passages between them, through which the product may at all times pass entirely out of the die, substantially as set forth.

4. A die composed of a base-block provided with a recess, substantially as set forth, and a plunger which, when inserted into said recess, will touch the walls thereof at two or more points for a distance equal to the depth of its insertion in said recess, and each cross-area of which for a distance greater than said depth of insertion is less than the area of said recess, the interior walls of said recess and the exterior walls of said plunger shaped to form the product desired and arranged as set forth, whereby there will remain one or more passages between them, through which the product may at all times pass entirely out of the die, substantially as set forth.

5. A die composed of a base-block provided with a recess, substantially as set forth, and a plunger, each cross area of which for a short distance from the lower end is less than the area of the recess in the base-block and for a further distance is still less, the sum of said distances being greater than the depth of insertion of said plunger in said recess, the interior walls of said recess and some portion of the exterior walls of said plunger being shaped and arranged as set forth, to form the desired product and leave one or more passages between said respective walls, through which the product may at all times pass entirely out of the die, substantially as set forth.

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