B. B. McFADDEN.

ENVELOP BLANK CUTTING DIE.

APPLICATION FILED JUNE 9, 1909.

953,220.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.

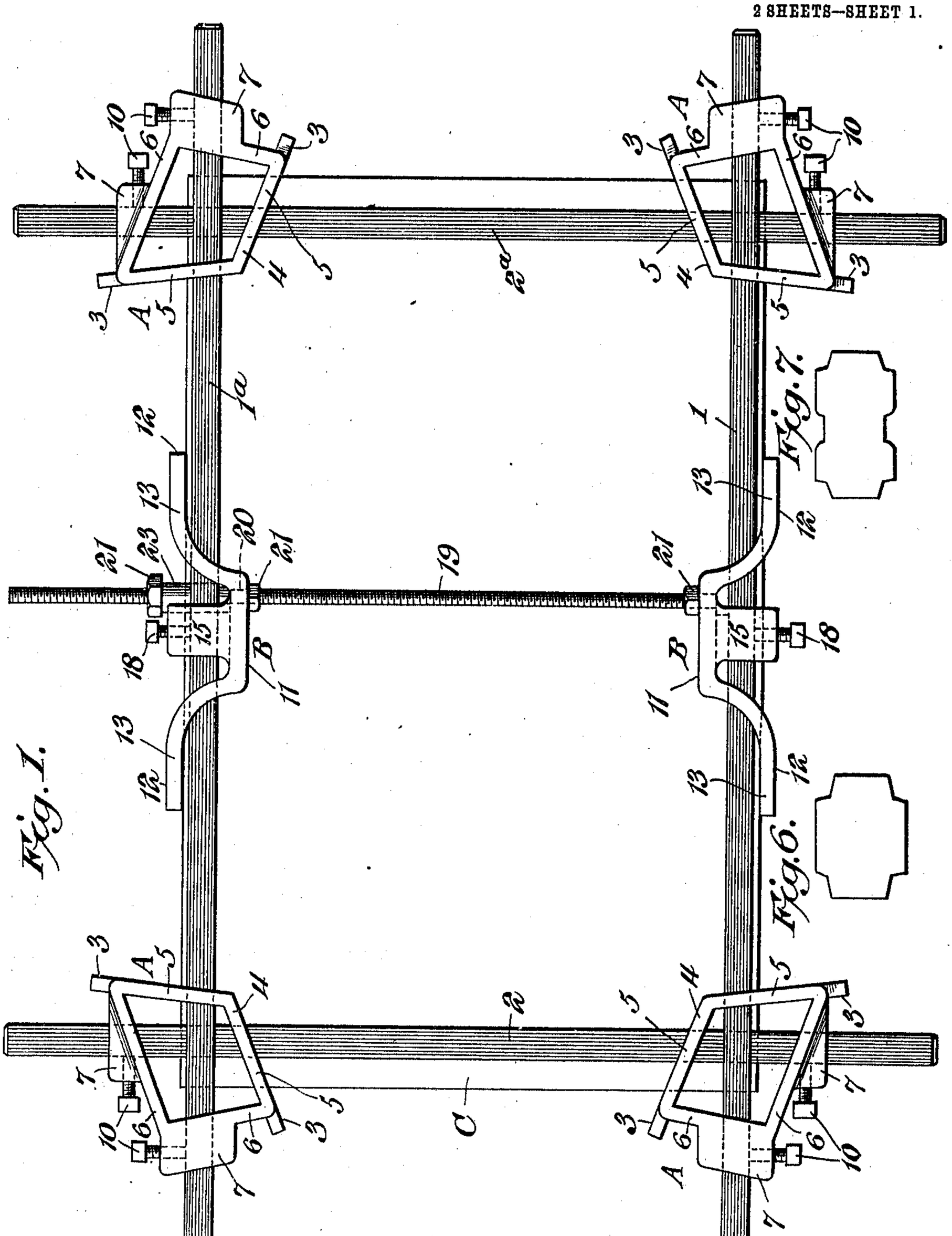

Fig. 1.

Fig. 7.

Fig. 6.

Witnesses

Howard D. Orr.

C. Bradway.

Benjamin B. McFadden, Inventor,

By E. G. Siggers.

Attorney

B. B. McFADDEN.

ENVELOP BLANK CUTTING DIE.

APPLICATION FILED JUNE 9, 1909.

953,220.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 2.

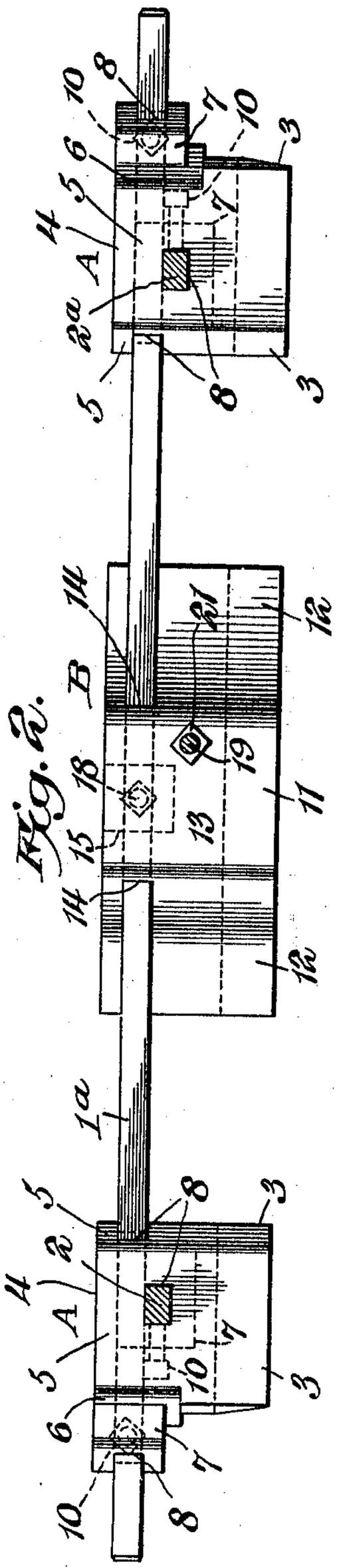

Fig. 2.

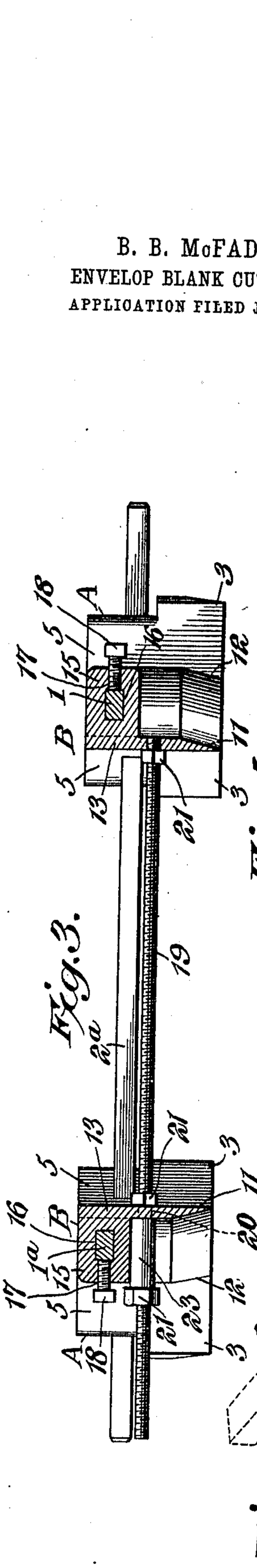

Fig. 3.

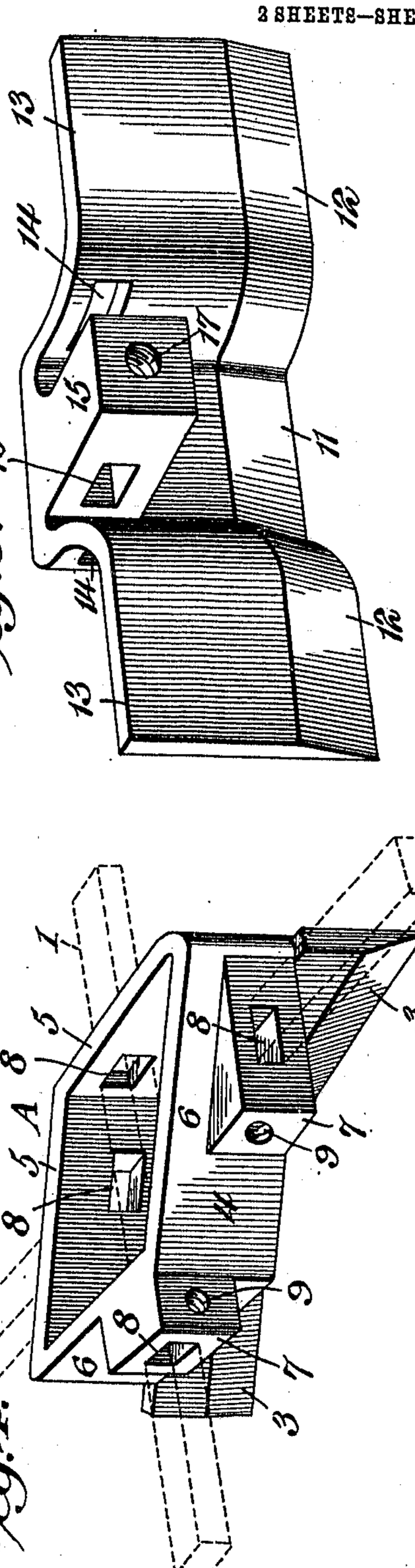

Fig. 5.

Fig. 4.

Witnesses

Howard D. Orr.

C. Bradway.

Benjamin B. McFadden, Inventor,

By E. G. Siggers.

Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN B. McFADDEN, OF BINGHAMTON, NEW YORK.

ENVELOP-BLANK-CUTTING DIE.

953,220. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed June 9, 1909. Serial No. 501,043.

To all whom it may concern:

Be it known that I, BENJAMIN B. McFADDEN, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented a new and useful Envelop-Blank-Cutting Die, of which the following is a specification.

This invention relates to a die for cutting envelops, book covers, labels and other paper blanks, and the principal objects of the present invention are to provide a die which is adjustable for cutting blanks of various sizes, of extremely light and durable construction, and of such design that the knives are prevented from spreading during the cutting stroke, so that the blanks at the bottom of the pile being cut will be of the same size as those at the top.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a plan view of the die. Fig. 2 is a longitudinal section thereof. Fig. 3 is a transverse section taken centrally through the die. Fig. 4 is a perspective view of one of the angle or corner cutters. Fig. 5 is a perspective view of one of the center cutters. Figs. 6 and 7 are views of the finished envelop and back cover blanks, respectively, drawn on a reduced scale.

Similar reference characters are employed for indicating corresponding parts throughout the views.

In carrying out the invention, I employ a pair of side bars 1 and 1^a and transversely-disposed end bars 2 and 2^a which are arranged with their ends crossing the ends of the side bars. These bars serve as cutter carriers and are adjustable relatively to each other for changing the size of the die for different blanks. At the point of intersection of two of the bars, a corner or angle cutter designated generally by A is arranged and these cutters are so designed that they will be maintained firmly in position on the bars without yielding during the cutting stroke. Each cutter consists of a pair of angularly-disposed blades 3 which are attached to a hollow polygonal body 4 composed of inner plates 5 of which the plates 3 are practically continuations and connected with and spaced from the plates 5 are outer angularly-disposed plates 6, each of which has a bearing boss 7. Each plate 5 and the plate 6 opposite thereto have alined openings 8 through which one of the bars of the die extends, so that the body of the cutter will have two bearing points on each bar located at opposite sides of the intersection of the two bars. These bars are preferably of non-circular cross section and the openings 8 are of similar shape, and the bars snugly fit in the same with such freedom as to permit a cutter to be adjusted longitudinally of its supporting bars. The openings 8 in one pair of plates 5 and 6 are arranged at a different level from the openings in the other pair of plates so as to permit the cutter-carrying bars to cross each other. The bosses 7 have threaded apertures 9 for receiving set screws 10 which bind against the bars for holding the cutter in place. While carrier supporting bars of square or non-circular cross section are here shown, it is to be understood that any other form of bar may be employed with means for clamping the cutters thereto, the essential feature of the invention being the relatively widely spaced bearing points between each bar and cutter so that the yielding of the cutter will be prevented during the cutting stroke. It will be obvious, by loosening the clamping screws 10, that the cutters can be moved inwardly or outwardly on either pair of bars, or both, for changing the size and shape of the blank to be cut.

In order to cut book cover blanks, additional cutters designated generally by B are employed for forming the recesses in the top and bottom edges of the blanks at the medial line thereof. These cutters are formed with a central blade section 11 with oppositely-curved wing sections 12 with their cutting edges continuous with the central section. These blades are formed on a body 13 which follows the general contour of the blades and which is provided with openings 14 for receiving one of the side cutter carrying bars. Extending outwardly from the central portion of the body 13 is an integral shank 15 which has an opening 16 alining with the openings 14 for receiving the carrier supporting bar, and this shank has a

threaded aperture 17 for receiving a screw 18 which binds against the cutter-carrying bar to hold the cutter firmly in place. In order to prevent spreading of the central cutters, a transverse connecting rod 19 is employed, as shown in Figs. 2 and 3, which has one end threaded in one of the central cutters B and the other end passing through an opening 20 in the other cutter. Jam nuts 21 are arranged on the screw for holding the screw rigidly in set position. A sleeve 23 is arranged on the screw for coöperating with the jam nut 21 to hold the cutter at the left of Fig. 3 in position. By loosening the sleeve and screwing the same and adjacent jam nut 21 inwardly or outwardly, the said left hand cutter can be adjusted in bringing the side bars closer or nearer together to adapt the die for narrower or wider blanks.

The die is shown in Fig. 1 in use as a cutter for book covers and the same is placed in position on a pile of paper C with the corner cutters disposed over the corners of the sheets of the pile and the central cutters at intermediate points along the longitudinal edges of the sheets. When placed in this position, pressure is applied to the die and the various knives cut down through the pile on perfectly straight lines, with the result that a blank is produced such as shown in Fig. 7. In case an adjustable book cover is desired, one of the central cutters B can be removed so as to allow the user to cut out the recess in the cover to the desired depth, according to the size of the book. When envelops are to be cut, both intermediate cutters are removed so that the corner or angle cutters A will alone operate with the result that a blank such as shown in Fig. 6 will be produced.

With a die of this character, the weight is reduced to a minimum so that it is not as tiring to the operator as are solid disks commonly in use, and by reason of the particular design of the die, the knives are firmly held in place, and by reason of the widely spaced bearing points between the cutters and their carrying bars, the blades are positively prevented from spreading, thereby overcoming one of the great objections to built-up dies heretofore proposed. The single die of the character referred to can be used in place of a great number of solid dies each intended for but one side blank, since the cutters of the present die can be adjusted within wide limits for producing large or small blanks.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a die of the class described, the combination of a plurality of cutter-carrying bars arranged in crossed relation, and a plurality of cutters each carried by a pair of bars and engaged therewith at opposite sides of the point of intersection of the bars.

2. In a die of the class described, the combination of parallel side bars, parallel end bars extending across the side bars, cutters mounted at the points of intersection of the bars, and each cutter having four bearing points on the bars spaced from the point of intersection thereof.

3. In a die of the class described, the combination of a pair of side bars adjustable toward and away from each other, a pair of end bars adjustable toward or away from each other and extending across the side bars, and cutters secured to the bars at the points of intersection and each having four points of engagement with the bars, said cutters forming the sole connecting means for securing the bars in adjusted position.

4. A die of the class described comprising pairs of inwardly and outwardly adjustable side and end bars arranged with their ends crossing, cutters secured to the bars at the points of intersection and each cutter having a pair of spaced bearings for each bar, said bearings being located at opposite sides of the point of intersection between the bars.

5. A die of the class described comprising inwardly and outwardly adjustable side and end bars arranged with their ends crossing each other at the corners of the die and cutters at the corners of the die and each bearing on each pair of crossing bars at points both inwardly and outwardly from the intersection of the bars, and means for clamping the cutters to the bars for holding the latter in different positions of adjustment.

6. A die comprising a plurality of cutter-carrying bars arranged transversely to each other with their extremities crossing, corner cutters forming the sole connecting means between the bars, and an additional cutter carried by one of the bars at an intermediate point.

7. A die comprising a plurality of cutter-carrying bars arranged transversely to each other with their extremities crossing, corner cutters forming the sole connecting means between the bars, a pair of additional cutters mounted at opposite points on two of the

bars, and means connecting the last-mentioned cutters for preventing spreading thereof.

8. A die comprising a cutter having a hollow polygonal body provided with openings in two opposite walls and a carrier-supporting bar extending through the openings, and means for clamping the cutter to the bar.

9. A die comprising a cutter having a hollow polygonal body provided with openings in two opposite walls and a carrier-supporting bar extending through the openings, and means for clamping the cutter to the bar, the blade of the cutter being disposed in the same plane with one of the said apertured walls.

10. A die comprising a cutter having a hollow body provided with two pairs of openings in opposite sides, a carrier member or bar extending through one pair of openings, a second carrier bar extending through the other pair of openings and crossing the first bar, and means for clamping the cutter on the bars.

11. A die comprising a cutter having a hollow body provided with two pairs of openings in opposite sides, a carrier member or bar extending through one pair of openings, a second carrier bar extending through the other pair of openings and crossing the first bar, means for clamping the cutter on the bars, and blades on the cutter forming continuations of the two sides of the latter.

12. A die comprising a cutter having angularly-disposed blades and a polygonal body portion extending outwardly from and connected with both blades, the opposed walls of the body having bearing openings arranged in different planes, a carrier bar extending through the openings of two opposite walls, a carrier bar extending through the openings of the other walls and intersecting the first bar at a point located within the said body, and means for clamping the cutter to the bars whereby the cutter forms the sole connecting means between the bars.

13. In a die, the combination of angularly-disposed bars, a cutter comprising a hollow body having oppositely disposed bearings in its walls for each bar and provided with a blade, and means for clamping the body to each bar whereby the said body forms a connector between the latter.

14. In a die, the combination of a cutter having a body and a blade, supporting bars extending entirely through the body and crossing each other within the body, and means on the body for separately clamping the same to the bars.

15. In a die, the combination of spaced parallel bars, cutters slidably mounted thereon and movable toward each other with the lateral adjustment of the bars, a member secured to and carried by the cutters for preventing spreading of the latter during the stroke.

16. In a die, the combination of spaced parallel bars adjustable laterally toward and from each other, cutters mounted thereon and movable longitudinally thereof, and an element extending from one cutter to the other for rigidly holding the same in spaced relation and forming means whereby the cutters are adjustable simultaneously along the bars, said member being adjustable to permit the cutters and bars to be adjusted laterally.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

BENJAMIN B. McFADDEN.

Witnesses:

THEO. R. TUTHILL,

THOMAS J. KENSON.