(No Model.)

W. H. BERRIGAN, Jr.

METHOD OF MANUFACTURING FASTENING DEVICES.

No. 506,202. Patented Oct. 10, 1893.

Fig. 1.

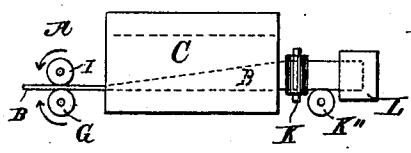


Fig. 2.

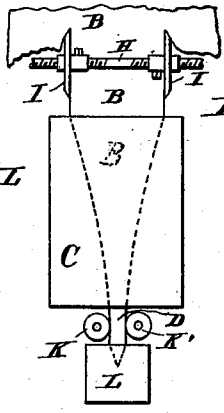


Fig. 3.

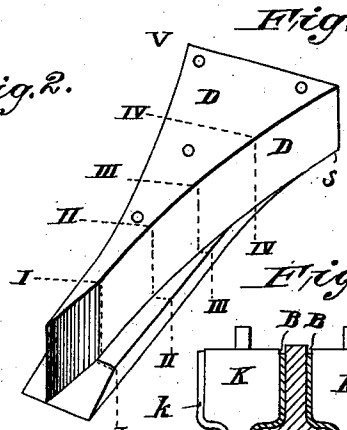


Fig. 4.

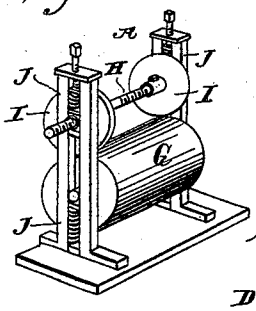


Fig. 5.

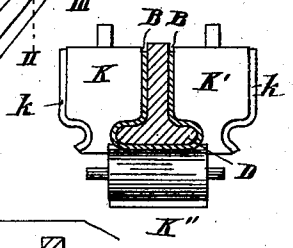


Fig. 6.

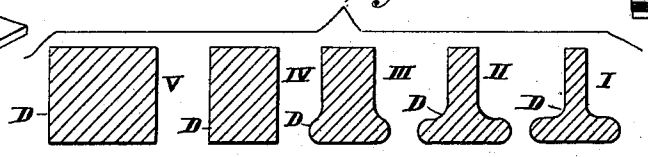


Fig. 7.

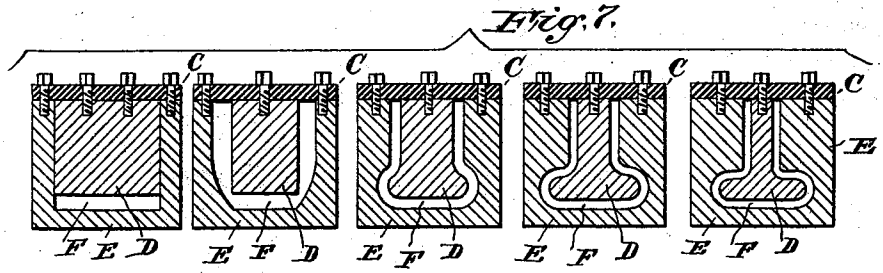


Fig. 10.

Fig. 8.

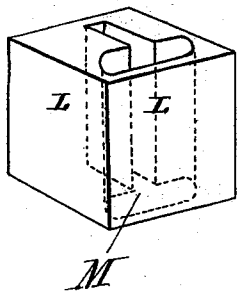
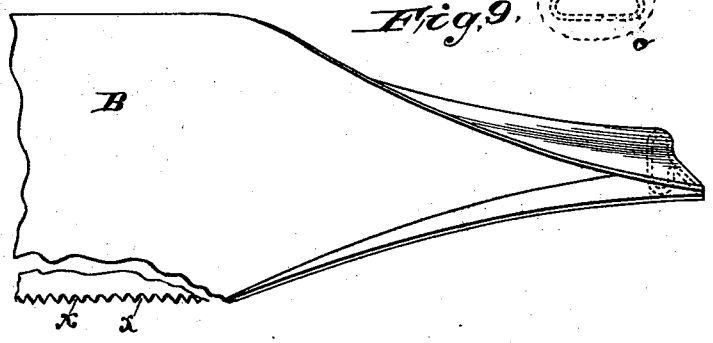


Fig. 9.



Attest,
Jas. F. Benjamin.
James Cosgrove

Inventor,
Wm. H. Berrigan Jr.

UNITED STATES PATENT OFFICE.

WILLIAM H. BERRIGAN, JR., OF NEW YORK, N. Y.

METHOD OF MANUFACTURING FASTENING DEVICES.

SPECIFICATION forming part of Letters Patent No. 506,202, dated October 10, 1893.

Application filed June 6, 1892. Serial No. 435,608. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BERRIGAN, Jr., a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented a new and Improved Method of Manufacturing Fastening Devices and in the Machines for Producing the Same, of which the following is a full, true, and accurate description.

Similar letters refer to similar parts in the several drawings.

My invention relates to improvements in the mode of manufacture of fastening and assembling devices, and in the means for carrying out such process of manufacture, its object being to enable a speedier and more economical production of such fastening-devices than is at present practiced.

In the drawings, Figure 1, shows a side view of a machine for practicing my invention. Fig. 2, shows a plan view of the same style of machine. Fig. 3, shows a form of the inner graduated die or core, hereinafter described. Fig. 4, shows a mechanism for defining the width of the sheet to be divided into fasteners. Fig. 5 shows a form of mechanism for dividing the sheet into fasteners of proper width. Fig. 6 represents various cross-sectional views of the inner die, Fig. 3, on the dotted lines, I, II, III, IV. Fig. 7 represents various cross-sectional views of the channel between the inner and outer dies. Fig. 8 represents a form of supplemental die for finishing the fasteners, with delivery slot. Fig. 9 represents a sheet going through the operation hereinafter described.

The length of a fastener, when referred to hereinafter is the distance between its extreme points, as shown in Fig. 10, the distance from S to T, in the direction of the arrow.

Heretofore it has been the practice to form a blank for each separate fastener, and to work it into final form by bending it around some centering-device, by one or more operations. This and kindred methods have been found to be tedious and expensive.

The object of my improvement is to lessen the time and labor necessarily employed in making fastening devices, while, at the same time, greatly multiplying the speed of production.

My invention contempletes the use of a sheet of material, and not a blank for a single fastener, so that it is possible to manufacture fasteners more continuously than heretofore with a direct increase in the amount of production.

To enable those skilled in the art to practice my invention, the following description, with reference to the several drawings, is given.

In the drawings referred to, A, is the cutting mechanism for determining the width of a sheet of material (the length of the fasteners), such material, preferably a pliant metal, being shown at B.

C is the die or core for forming the cut sheet into shape to be subdivided into a row of fasteners, said die, C, consisting of two parts, the inner die or core, D, and the outer die or shell, E.

F, is the channel between the inner die, D, and the outer die, E, in which the sheet, B, is formed into shape for subdivision.

G is a roller forming part of the cutting device, A, and H, is a revolving-cutter forming the other part of the cutting-device, A, carrying the adjustable circular cutting-blades, I, I.

J, J, are springs for holding the roller G and cutter H, in firm intact.

K, K′, K″, are shearing-rollers for dividing the sheet, B, at the proper stage, into fasteners, said rollers bearing around their edges, the knives, *k;* L is a supplemental-die into which the fasteners are forced after passing the shearing-rollers K, K′, K″, of which said supplemental die L any portion of the inner die, D, Fig. 3, may be the inner die.

M, Fig. 8 shows a delivery slot through which the finished article is delivered.

The method of manufacture of fasteners is the following: A sheet of material B, is placed upon the rollers, H, G, of the cutting-device by any of the well known means; said sheet is cut into the proper width by means of the adjustable cutting-blades, I, I. The revolution of the rollers, G, H, propels the sheet, B, into the channels, F, of die, C. The cutting of the material, B, into the desired width, so as to make a fastener of the proper length, is simultaneous with the revolution of the rollers, G and H, constantly pushing the mate-

rial, B, into the channel, F. Said material, B, is forced to envelop the inner die, D, assuming the shape of the channel, F, at the various graduations between the inner die or core, D, and the outer die or shell, C, because of the immobility of the outer die, C. A portion of the outer die, E, should be removed so as to allow the interpolation of the shearing rollers, K, K', K'', as shown in Figs. 1 and 2, the object of this being to allow the sheet, while in process of enveloping the inner-die, D, to be cut into the proper width of fasteners, and the subdivisions thereof to be propelled onward for completion in the supplemental die, L. After the sheet, B, reaches a certain stage in the graduated channel F, say, after III in the direction of II, said shearing-knives, K, K', K'', may be interpolated, and the material cut into the proper width with or without any cessation in the course of the progress of the sheet, B, to the supplemental-die, L. Said shearing-rollers, K, K', may be made to fit the die, D, or else rotary-knives may be used to cut the sheet into proper widths; K'', is a revolving cutter operated simultaneously with K, K', to assist in cutting the material against the base of the die into proper widths for fasteners, and as these shearing-rollers, K, K', K'', revolve they urge the material, B, onward, to the supplemental-die, L. The said shearing-rollers, K, K', K'', may be mechanically connected with the mechanism for determining the width of the sheet, or otherwise propelled so as to perform the functions required. Of course, any equivalent device for subdividing the sheet, B, into proper widths for fasteners may be substituted for the device herein described without departing from my invention. After the said sheet has been subdivided into the proper widths, the portions thereof are substantially incomplete fasteners, having the shape of that portion of the channel F, at which it was cut, say, III, Fig. 6. The pushing of the material behind it urges it into the supplemental die, L, for finishing the fasteners, the inner die of which is preferably that portion of the inner die or core, D, (Fig. 3,) immediately following that point at which the shearing-rollers, K, K', K'', are interpolated. The cut fasteners urged forward by the sheet, B, and the action of the shearing mechanism are forced into the supplemental die, L, which is so shaped as to envelop that portion of the inner die, D, after the shearing mechanism, K, K', K'', leaving all around it a channel of the same width throughout its length, and the forcing of the fasteners into the supplemental die, causes them to closely envelop the inner die, by reason of the immobility of the supplemental die, L, graduated and narrowed to fit the inner die, D, in the same manner as the parts, E, D, of the main-die, C, Fig. 7. When these blanks reach the extreme point of the inner die, D, they will be fasteners of the ordinary shape, and, having been pushed off the die, D, by the material following, may be caught in a receptacle placed underneath the supplemental die, L. The delivery slot, M, may be either directly underneath or opposite the extreme point of the inner die, D. The fastening-devices may be pointed either by so shaping the shearing mechanism, K, K', K'', as to cut points simultaneously with the determination of the width of the fasteners, or else the revolving cutters, I, I, of the cutting mechanism, A, may be serrated, so as to cut the material, B, with a flute-edge, shown at X, X, Fig. 9, and the material divided, by the shearing-mechanism, K, K', K'', between such points.

Of course, I do not limit myself to the employment of any material from which the fasteners are to be made, but a soft, pliable, malleable metal is much more preferable than a hard and brittle metal.

Different widths of the sheet, B, for different lengths of fasteners, may be determined by having the shaft of the roller H, Fig. 4, threaded, and with a suitable locking-device, so as to permit the revolving-blades, I, I, to be placed at different distances apart, or any other suitable means may be employed for attaining this result.

Another method of making fastening devices is to employ such a form of mechanism as will permit the subdivision of the sheet at the stage of its conversion corresponding to the finished article: for instance, instead of the shearing rollers, K, K', K'', or equivalent mechanism, rollers may be used, some of which bear rows of knives around their edges and the remainder having smooth surfaces, and in the passage of the sheet between these rollers, the sheet will be subdivided up into finished fasteners. Equivalent means may be employed without departing from my invention. The fasteners made on this form of machine will not, however, be as highly finished as those made by the first method.

I do not limit myself to the employment of an outer die, E, in the main die, C, as the material, B, may be forced to envelop the inner graduated die by series of rollers or other means, and rollers may, if desired, be substituted for the supplemental die, L, to perform its functions.

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

1. The method of producing fastening or assembling devices, consisting of forcing a sheet of material into a channel between dies or rollers, so as to cause the material to assume the shape of the said channel, subdividing the sheet at a stage before completion, and finishing the subdivided fasteners in a channel between dies or rollers, substantially as described.

2. The method of producing fastening or assembling devices, consisting of forcing a sheet of material into a channel, between dies or rollers, so as to cause the material to assume

the shape of the said channel, and subdividing the sheet into widths proper for fastenings, substantially as described.

3. In a machine for making fastening or assembling devices, a die, C, consisting of an inner graduated die, D, and an outer die, E, to fit, in combination with mechanism for determining the width of said fastening or assembling devices, substantially as and for the purposes described.

4. In a machine for making fastening and assembling devices, a die, C, consisting of an inner graduated die, D, and an outer die, E, and mechanism for determining the width of said fastening or assembling devices, in combination with a supplemental-die, L, carrying a delivery slot, substantially as and for the purposes set forth.

5. In a machine for making fastening or assembling devices, a mechanism, A, for cutting material into desired widths, consisting of rollers, one of which rollers carrying adjustable blades, and both held in firm contact with each other, in combination with a die, C, consisting of the outer die, E, and inner die, D, together with mechanism for determining the width of the fasteners or assembling-devices, and supplemental-die, L, substantially as and for the purposes described.

6. The process of converting a sheet of material into fasteners or assembling devices, consisting of defining the width of such sheet for the purpose of determining the length of the fasteners, causing the said material to envelop a properly graduated die, and sub-dividing said material into fasteners or assembling-devices, substantially as and for the purposes described.

WILLIAM H. BERRIGAN, JR.

In presence of—
JAMES J. COSGROVE,
CONRAD HELLER.