

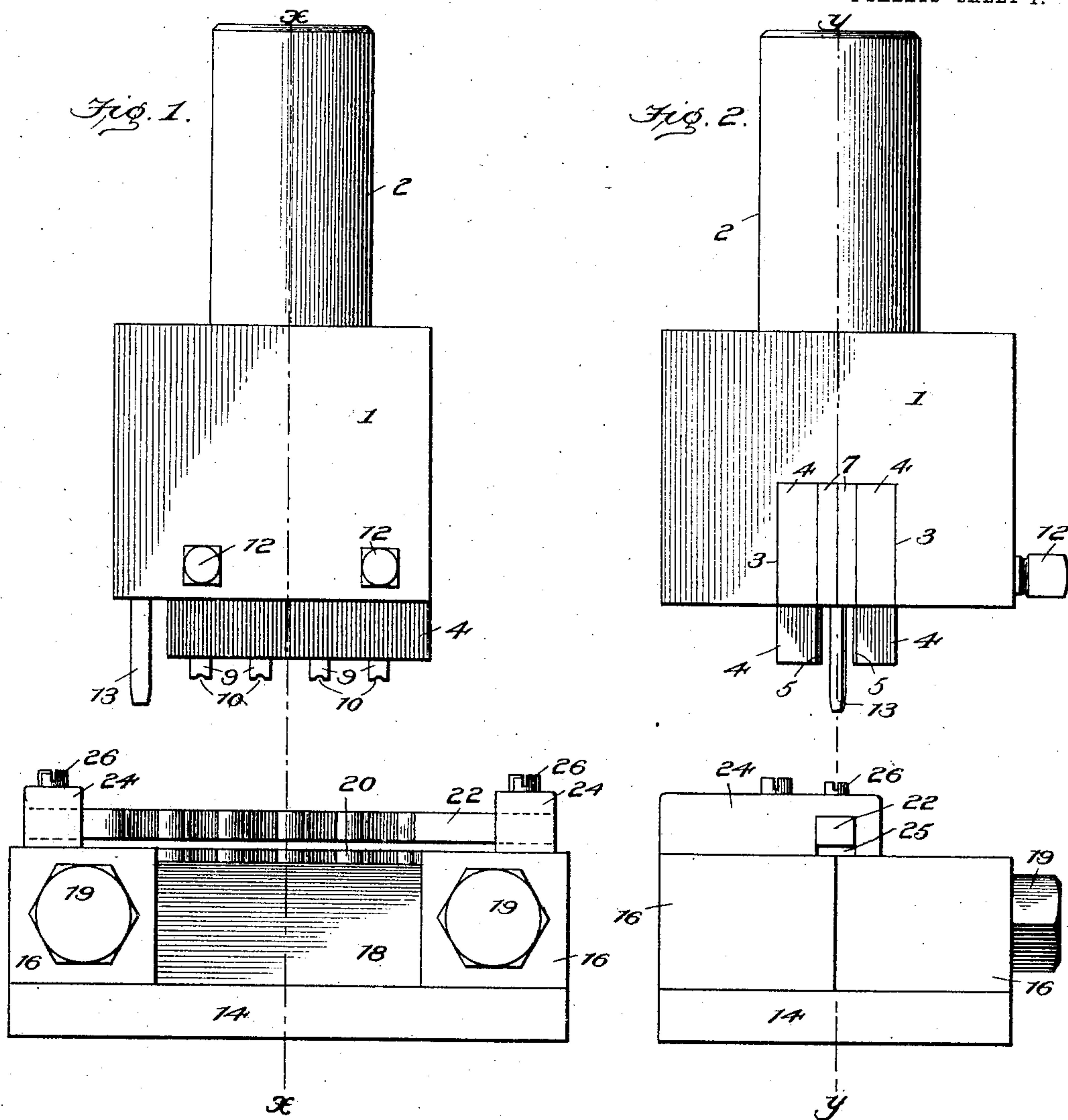
No. 786,504.

PATENTED APR. 4, 1905.

R. B. LEWIS.
DIE FOR CUTTING CONTIGUOUS FASTENERS.

APPLICATION FILED JAN. 6, 1904.

2 SHEETS—SHEET 1.



Witnesses

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C. G. Heyman

Inventor
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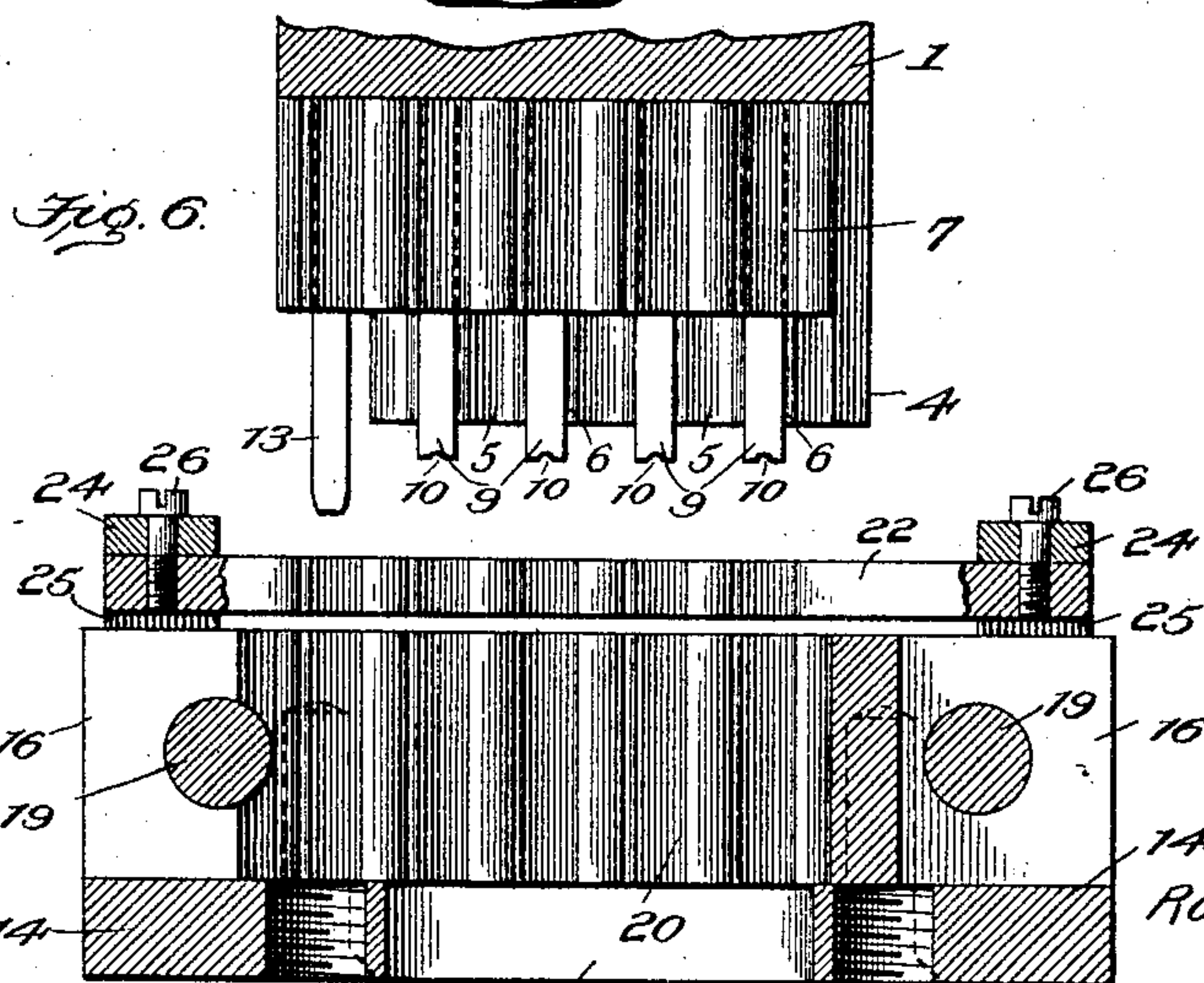
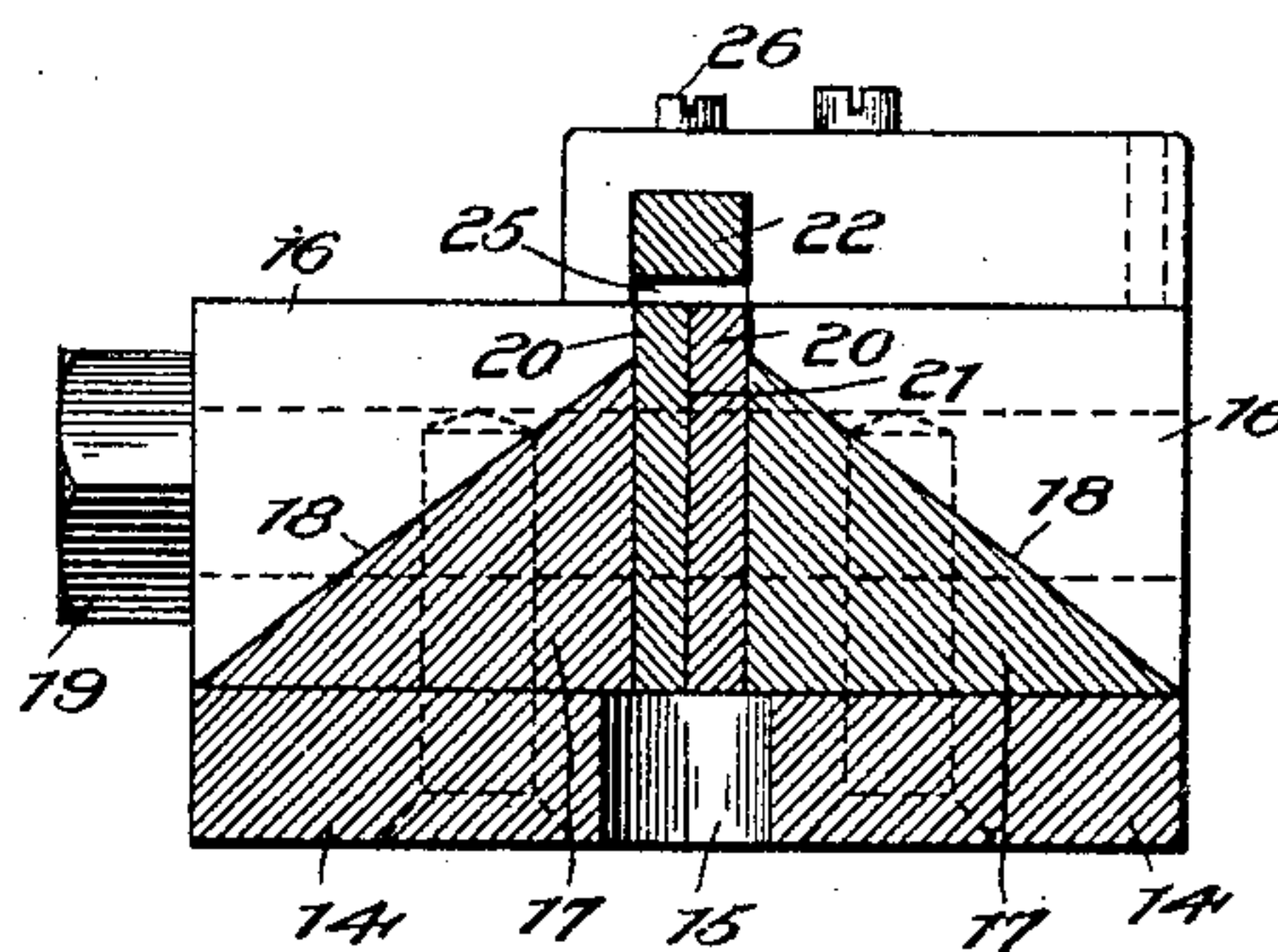
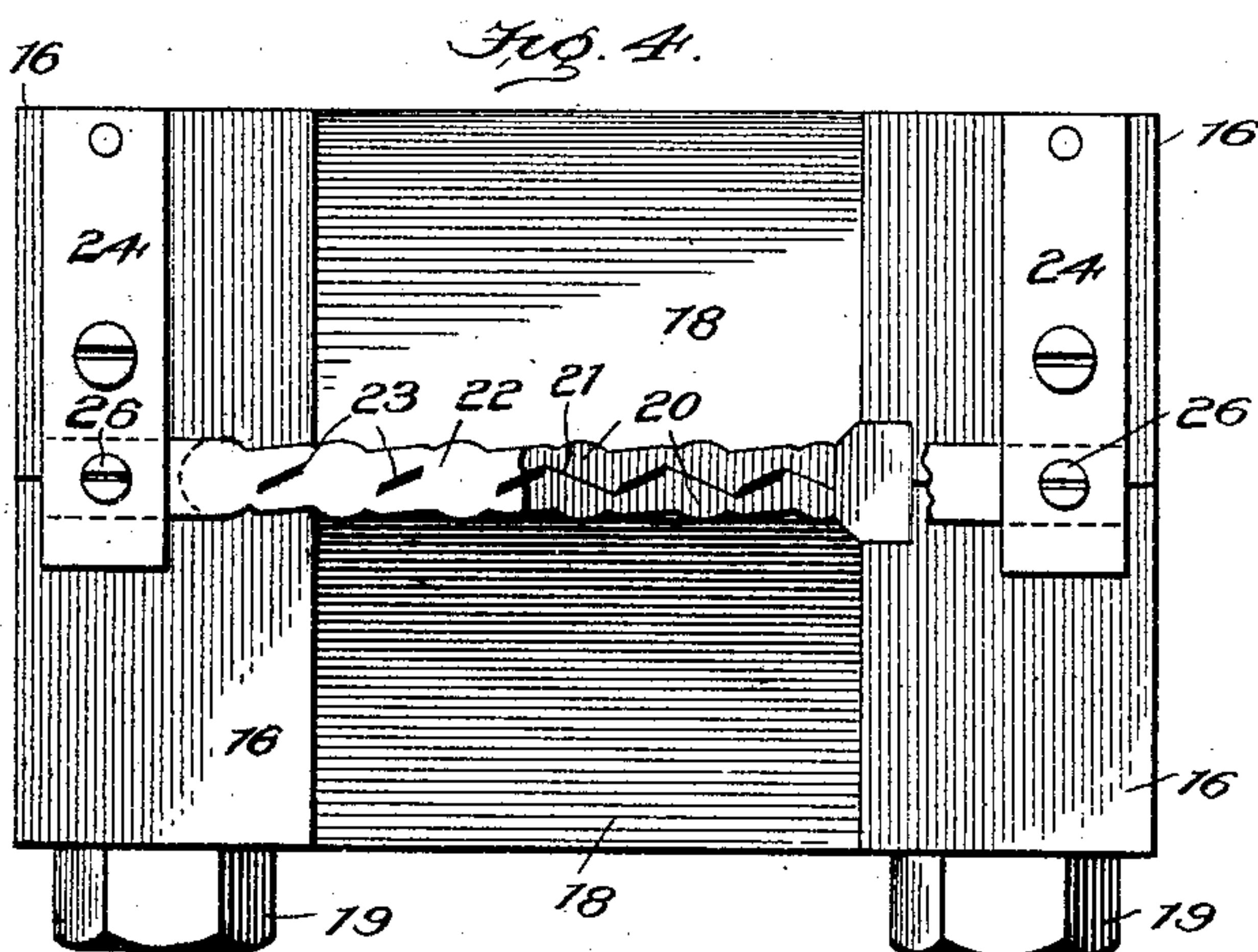
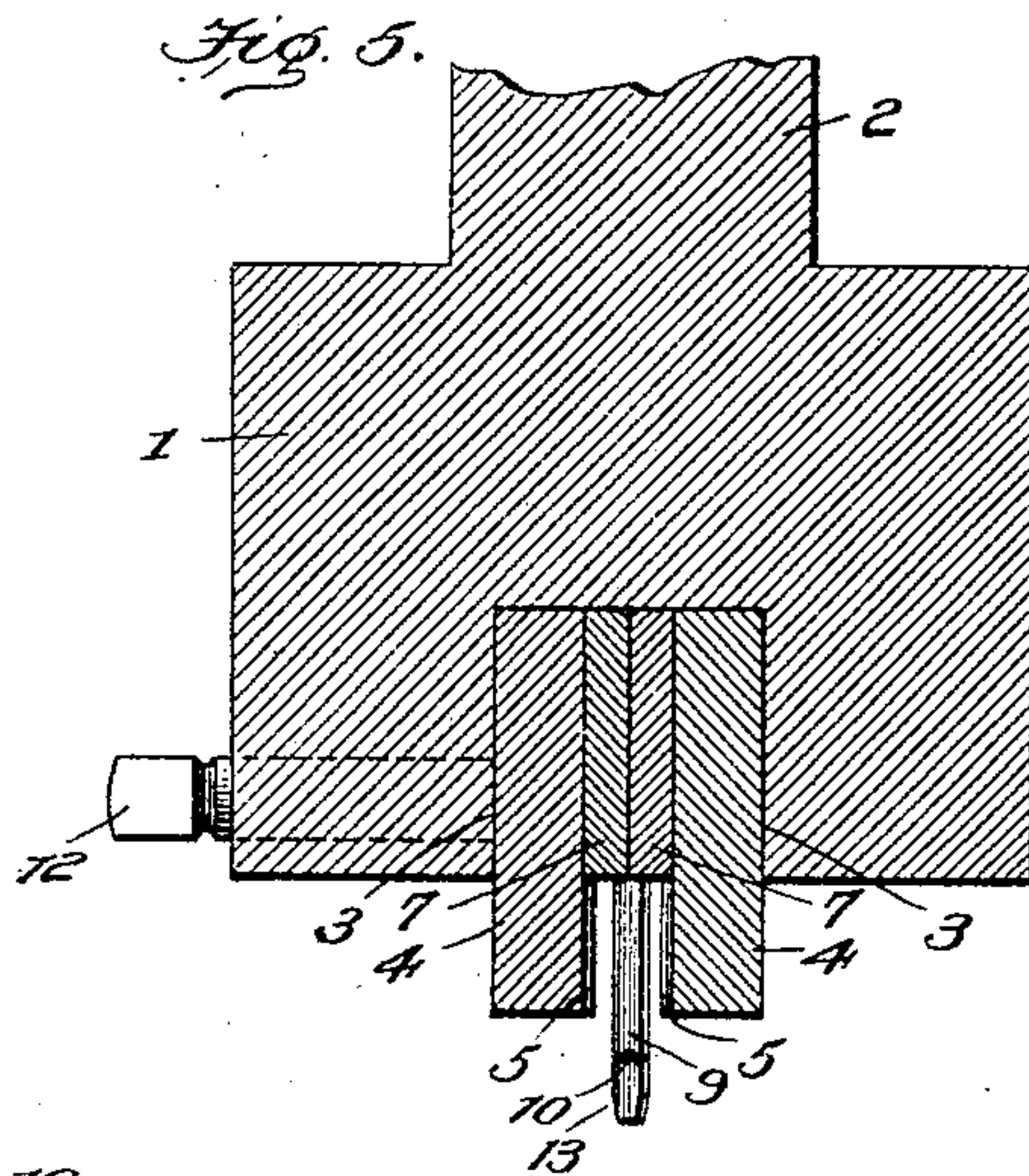
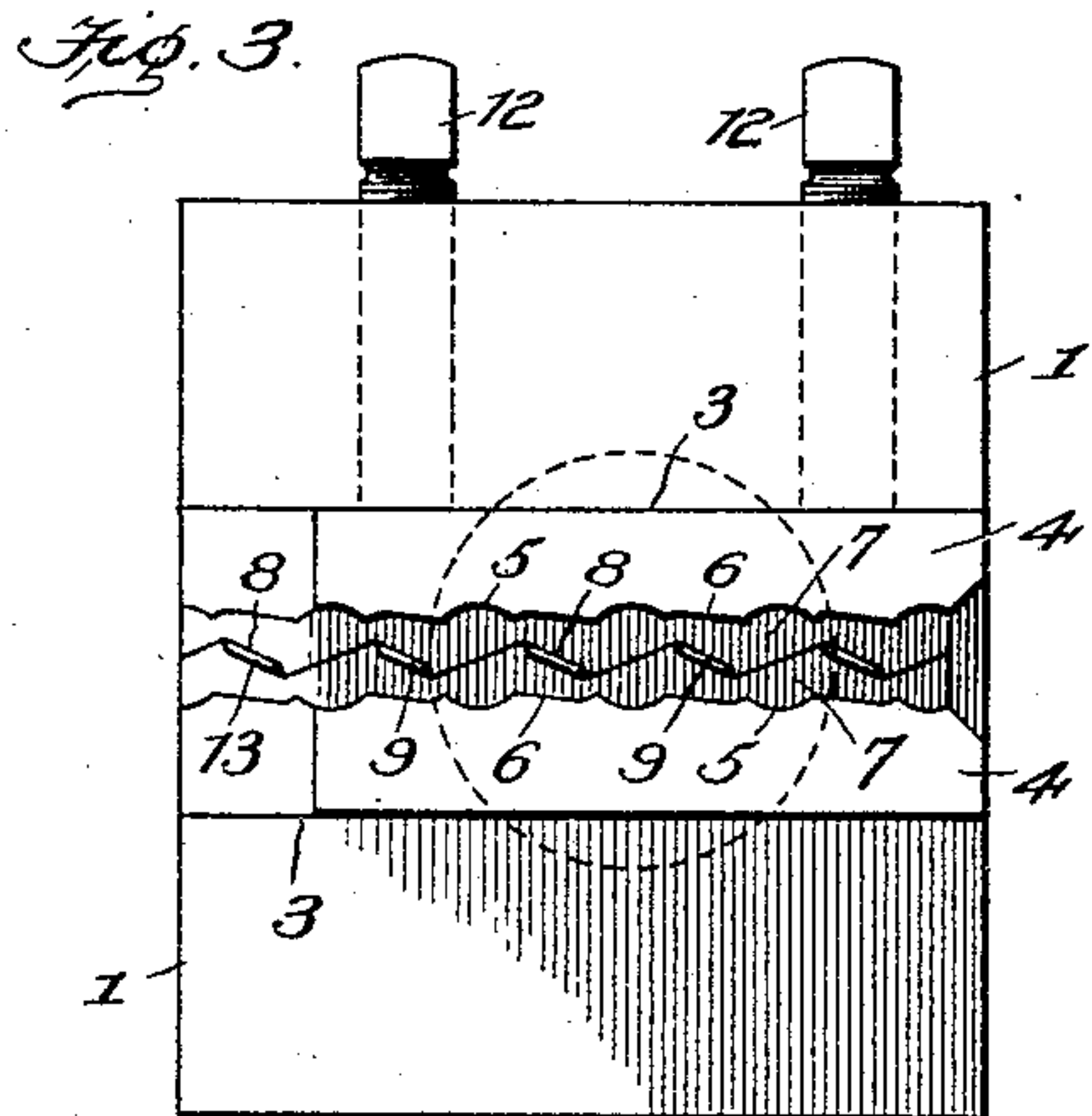
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UNITED STATES PATENT OFFICE.

ROBERT B. LEWIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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DIE FOR CUTTING CONTIGUOUS FASTENERS.

SPECIFICATION forming part of Letters Patent No. 786,504, dated April 4, 1905.

Application filed January 6, 1904. Serial No. 187,894.

To all whom it may concern:

Be it known that I, ROBERT B. LEWIS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Dies for Cutting Contiguous Fasteners, of which the following is a specification.

My present invention relates to certain new and useful improvements in die mechanism especially constructed for forming metallic fasteners or rivets of the type shown and described in the Letters Patent granted upon the 28th day of October, 1902, to John S. Stokes, No. 712,422, in which a series of rivets or fasteners are joined together in a continuous strip of indefinite length, each rivet or fastener comprising a head and two prongs extending outward from the head at opposite sides thereof, the points of the prongs of one rivet or fastener being connected to the heads of adjacent rivets or fasteners and the prongs of the fasteners being slightly separated one from the other by diagonally-arranged punch- openings and all the fasteners of the strip being disposed at an angle to a line taken longitudinally and centrally of the strip. Continuous fasteners or rivets of this type are formed from a thin metallic ribbon by cutting opposite edges of the strip to form portions of the heads and the prongs of the rivets or fasteners and punching out equidistant diagonal slots or openings to form the opposite sides of the prongs and heads, the resultant article being a continuous strip of contiguous rivets or fasteners. This strip is fed into a forming and setting-up machine, where the fasteners are severed and applied one at a time.

In a copending application, filed by me on the 5th of September, 1903, Serial No. 172,135, I show and describe die mechanism for cutting rivets or fasteners of the type herein shown and described; but in the mechanism forming the subject-matter of said application the punches are not located between the edge-trimming cutters, as they are in my present construction, but instead they are removed from but in line with said edge-trimming cut-

ters, so that in operation the cutting and punching is done simultaneously, but at different portions of the strip. This construction of mechanism is especially adapted for cutting small rivets or fasteners, while my present invention is more particularly adapted for cutting rivets or fasteners of larger size.

Briefly and generally stated, the present invention comprises an upper and a lower die member, the upper member carrying separated edge-trimming cutters with punches located between and having their cutting ends projected slightly below the working edges of said edge-trimming cutters, and a lower die member comprising a male die of the shape of the rivet-strip to be formed and having diagonally-arranged punch-openings therein, these two parts being constructed, arranged, and cooperating in the manner and for the purpose hereinafter described.

In order to enable others to fully understand, make, and use my said invention, I will now proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the upper and lower members of die mechanism constructed in accordance with this invention. Fig. 2 is an end view of the same looking toward the right of Fig. 1. Fig. 3 is a bottom plan view of the upper member of the die mechanism. Fig. 4 is a top plan view of the lower member of the die mechanism. Fig. 5 is a transverse section on the line *x x*, Fig. 1. Fig. 6 is a longitudinal sectional view on the line *y y*, Fig. 2. Fig. 7 is a plan view of a strip of contiguous rivets or fasteners formed by the die mechanism.

Referring to the drawings, the reference-numeral 1 designates a head provided with a shank 2, by which the said head may be removably attached to the plunger of any suitable form of reciprocatory stamping-press. The said head 1 is provided in its under side with a central longitudinally-extending groove or channel 3, in which is removably inserted two separated edge-trimming cutters, each comprising a blade 4, the adjacent lon-

longitudinal edges of which are shaped to conform to the outline of a gang of contiguous rivets or fasteners, the said cutting edges in the present instance having a plurality of spaced outwardly-extending rounded-out portions 5, connected by substantially straight edges 6, as more clearly shown in Fig. 3 of the drawings. The said cutting-blades 4 extend some distance below the under face of the head 1, as more clearly shown in Figs. 1, 2, and 5, and said blades are held separated by means of a pair of plates 7, the outer edges of which are preferably shaped to conform to the shape of the adjacent edges of the blades 4 and the adjacent or abutting edges of the plates 7 being of zigzag shape, as more clearly shown in Fig. 3 of the drawings, some of the zigzag walls being cut away to provide openings 8, in which are inserted and clamped diagonally-arranged punches, each punch comprising a blade 9, having its lower cutting end slightly concaved, as at 10, Figs. 1 and 6. The edge-trimming blades 4 and the punch-clamping plates 7 are assembled and placed in the longitudinal recess 3 of the head, and these parts are then tightly clamped in said recess by means of the screws 12. It will be seen by referring to the drawings that the punches 9 extend slightly below the edge-trimming cutters 4. Hence in the operation of the mechanism, as will be more clearly hereinafter described, the punches will operate slightly in advance of the edge-trimming cutters.

By referring to Figs. 1 and 3 it will be seen that the edge-trimming blades or cutters 4 do not extend throughout the entire length of the head, but, to the contrary, terminate at a point slightly removed from the rear wall of said head. The punch-clamping plates 7, however, extend throughout the entire length of the head, or, at least, extend farther than the edge-trimming cutters, and between the said extended portions of the plates 7 is located a centering or alining blade 13, of the shape of the punch-openings, the lower end of which blade extends slightly below the lower ends of the punches, for a purpose presently to be described.

By having the outer face or wall of each clamping-plate 7 shaped to conform to the irregular walls of the edge-trimming cutters or blades 4 it will be seen that when the parts are assembled the relative positions thereof cannot be changed by accident or otherwise. Hence it is certain that the punches will always cut the punch-openings in the strip being formed in the proper position relative to the heads and prongs of the rivets or fasteners.

The lower member of the die mechanism comprises a base-plate 14, having a centrally-arranged longitudinal recess 15, through which the scrap-punchings formed by the punches may readily pass. Mounted upon the base-plates 14 is a bed comprising two blocks hav-

ing rectangular end portions 16, each pair of said rectangular end portions 16 being joined by a substantially triangular-shaped web 17, the upper face 18 of each of which is inclined downwardly, as more clearly shown in Fig. 5, and these inclined faces serve to direct away the scrap metal formed by the edge-trimming cutters. The blocks 17 are secured to the base-plate 14 by means of screws or otherwise, and said blocks are secured together by means of screws or bolts 19. Between the webs 18 of the said blocks is clamped a male die comprising a pair of plates 20, the abutting faces of which are cut on zigzag lines 21, some of the walls of which are provided with openings to receive the punches 9, the outer edges of these plates 20 being shaped to conform to the inner adjacent edges of the edge-trimming cutters 4. In other words, the said male die is of substantially, if not exactly, the shape of the strip of contiguous rivets or fasteners to be formed, such a strip being shown in Fig. 7 of the drawings, in which *a* indicates the heads of the rivets, and *b* the prongs projecting from opposite sides of the heads, the prongs of adjacent rivets being separated by diagonally-arranged punch-openings *c*, and the points of the prongs being connected only to the heads of adjacent rivets. Arranged above the male die and separated therefrom by a narrow space, which is to be governed by the thickness of the strip or ribbon from which the rivets are cut, is a stripper-bar 22, which is of exactly the same shape as the strip of rivets or fasteners being formed, the said stripper-bar having diagonally-arranged punch-openings 23, as more clearly shown in Fig. 4. The stripper-bar 22 is attached at its opposite ends to supporting-blocks 24, each of said blocks having an opening 25, into which an end of the stripper-bar passes, the said ends being adjustably secured in said openings by means of screws 26, passing through the block 24. The walls of the openings 25 constitute guides for the strip or ribbon as it is being fed to the die mechanism.

The operation of the die mechanism herein shown and described may be briefly stated as follows, it being understood that the two members thereof are mounted in a suitable stamping-press having a reciprocating part and a bed: A thin metallic ribbon having straight edges, as shown at A to the right of Fig. 7, is fed forward in a step-by-step manner between the male die and the stripper located slightly above the same, and when a sufficient length of the strip has been so fed the feeding operation ceases for a moment and the upper die member is caused to descend to punch and cut the strip, such as shown in Fig. 7. As the punches 10 project below the edge-trimming cutters 4, it will be seen that the diagonal punch-openings are formed first, and the edges of the strip are then trimmed on the further descent of the upper die member.

The said upper die member is then caused to ascend, and the strip is fed forward until the last punch-opening of the gang just comes under the centering or alining blade 13, so that on the next descent of the upper die member said alining blade will enter this punch-opening before the punches or edge-trimming cutters are brought into operation, thus insuring a true and accurate alining of the strip.

By the construction of die mechanism herein shown and described it will be seen that the parts are constructed and arranged in such manner that they may readily be removed and replaced in case of breakage or for sharpening or other purposes. One of the most important features of the present invention, however, resides in the manner of mounting the punches and other cutting elements between supporting-plates. This style of construction allows for a certain amount of resiliency being given to the cutting parts, thus increasing their shock-resisting powers. Furthermore, this support is quite essential in hard-tempered punching and cutting elements of this nature, for if any warp should occur during the tempering operation, which is very likely, the clamping-plates will tend to straighten out such warp when the elements are clamped in position for use. Again, as the cutting and punching elements are ground away in the process of sharpening it is only necessary to release the clamping-plates, and the said elements may be readily readjusted, so that it is always possible to obtain the maximum strength and efficiency of said elements.

What I claim is—

1. Die mechanism of the character described, comprising means for trimming opposite edges of a strip to form portions of the heads and prongs of contiguous fasteners, and means located between the edge-trimmers for punching properly-spaced openings in said strip to complete the formation of the strip.

2. Die mechanism of the character described, comprising cutters for trimming opposite edges of a strip to form portions of the heads and prongs of a gang of contiguous fasteners, and punches located between the edge-trimming cutters for forming equidistant openings in the strip between the previously-formed heads to complete the formation of the strip.

3. In die mechanism of the character described cutters for trimming opposite edges of a strip to form portions of the heads and prongs of a gang of contiguous fasteners, and punches located between the edge-trimming cutters for forming equidistant openings in the strip between the previously-formed heads to complete the formation of the strip, the ends of the said punches extending below the said cutters, and operating in advance thereof.

4. Die mechanism of the character described, comprising a head, a pair of edge-

trimming blades, and a gang of punches carried by the head, said punches being located between the blades, and a base-block carrying a male member, which coöperates with the edge-trimmers and a female member which coöperates with the punches, said female member being located between the male member.

5. Die mechanism of the character described, comprising a head, a pair of edge-trimming cutters, and a gang of punches carried by the head, said punches being located between the cutters, a base-block carrying a male and a female member which coöperate with said cutters and punches, and a stripper-bar of the shape of the fasteners being cut, coöperating with said edge cutters and punches.

6. Die mechanism for forming contiguous metallic fasteners of the character described, comprising a head carrying a pair of edge-trimming cutters shaped to trim opposite edges of a metallic ribbon to form portions of the heads and prongs of a gang of fasteners, a series of punches also carried by the head and located between the cutters, each punch comprising a flat diagonally-arranged blade, and male and female die members coöperating with said cutters and punches, respectively, the said female die member being located between the opposite edges of the male die member.

7. Die mechanism of the character described, comprising a head provided with a longitudinal channel, edge-trimming blades mounted in said channel, clamping-plates located between the said blades, punches clamped between said clamping-plates, means for holding the said parts to the head, and male and female die members coöperating with said cutters and punches.

8. In die mechanism of the character described a head having a longitudinal channel, edge-trimming cutters comprising blades removably mounted in said channel, a pair of clamping-plates located between the said blades and having their abutting edges cut on zigzag lines, punches clamped between the zigzag edges of said plates, and means for securely holding said elements in the channel in the head.

9. In die mechanism of the character described, a head having a longitudinal channel in its under face, edge-trimming blades located in said channel and having their adjacent edges shaped to form portions of the heads and prongs of a gang of contiguous fasteners, clamping-plates located between said blades and having their outer edges shaped to conform to the configuration of the adjacent edges of the said blades, diagonally-arranged punches clamped between the abutting faces of the plates, and means for securely fastening said elements to the head.

10. In die mechanism of the character described, two coöperating members, one of said members carrying edge-trimming cutters and intermediate punches, and the other member

carrying a male and a female die shaped to conform to and coöperating with said cutters and punches.

11. Die mechanism of the character described, comprising two coöperating members, one of said members consisting of separated cutters for trimming opposite edges of a metallic strip to form portions of the heads and prongs of a gang of contiguous fasteners, and punches located between the said cutters for forming equidistant openings in the strip between the previously-formed heads to complete the formation of the strip, and the other

member consisting of two plates, the outer longitudinal edges of which are shaped to conform to the adjacent edges of the cutters and the abutting edges of said plates cut on zigzag lines and having openings to receive the punches.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT B. LEWIS.

Witnesses:

CHAS. H. BURR,

CHARLES H. RUSSELL.