No. 814,058. PATENTED MAR. 6, 1906.

C. J. LEYERS.

APPARATUS FOR MAKING WIRE CORE HAIR PINS.

APPLICATION FILED JUNE 7, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

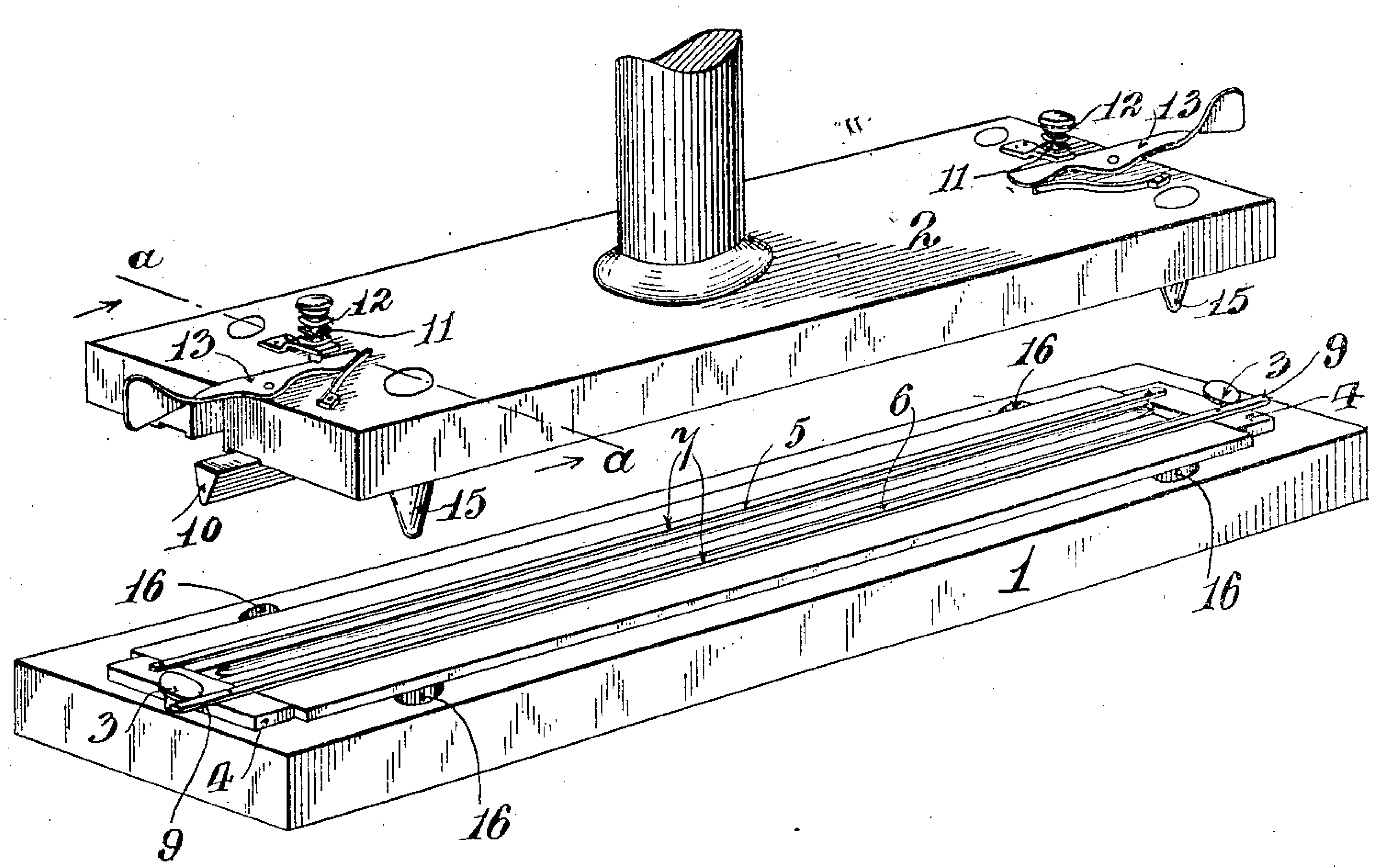
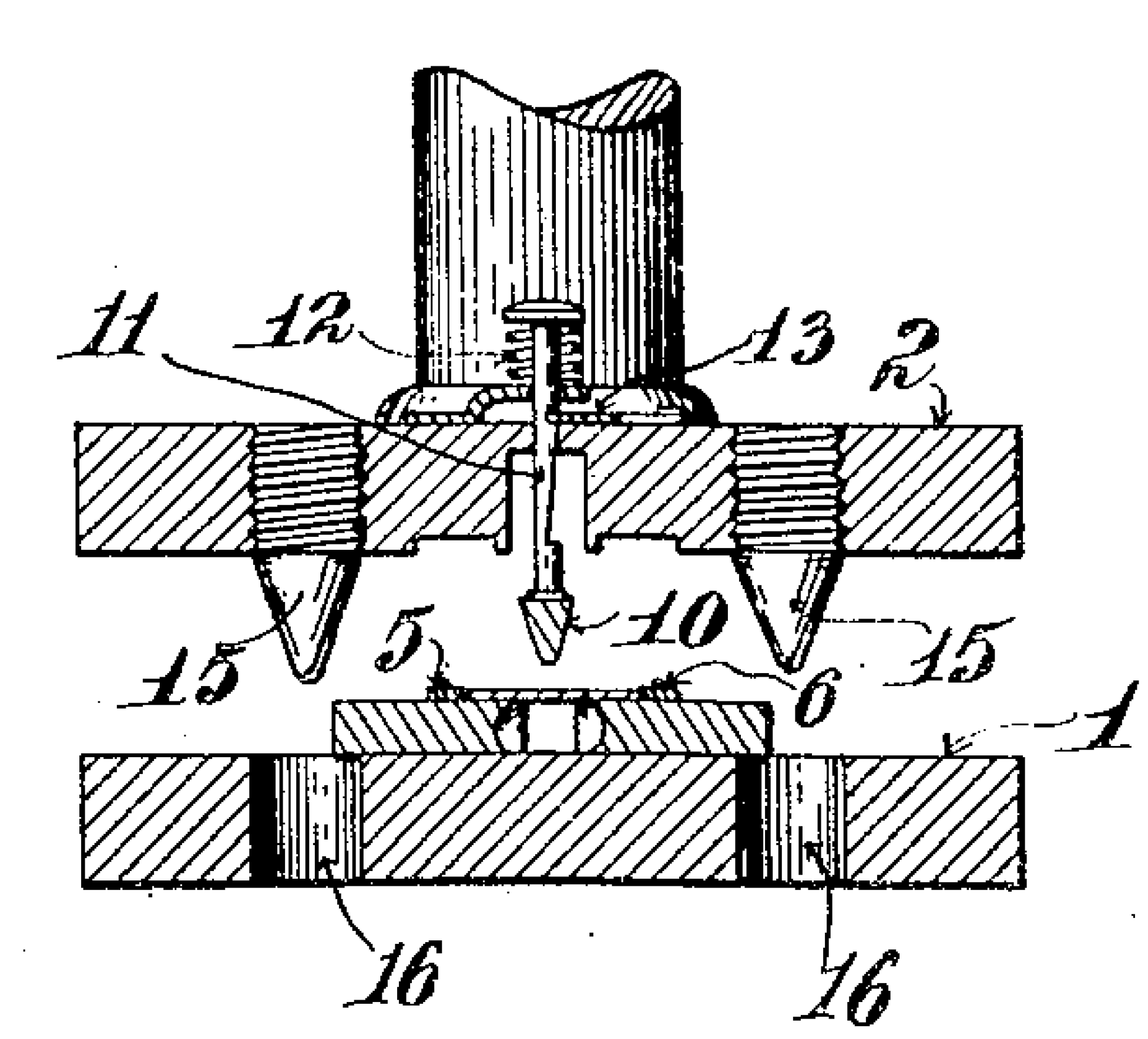


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

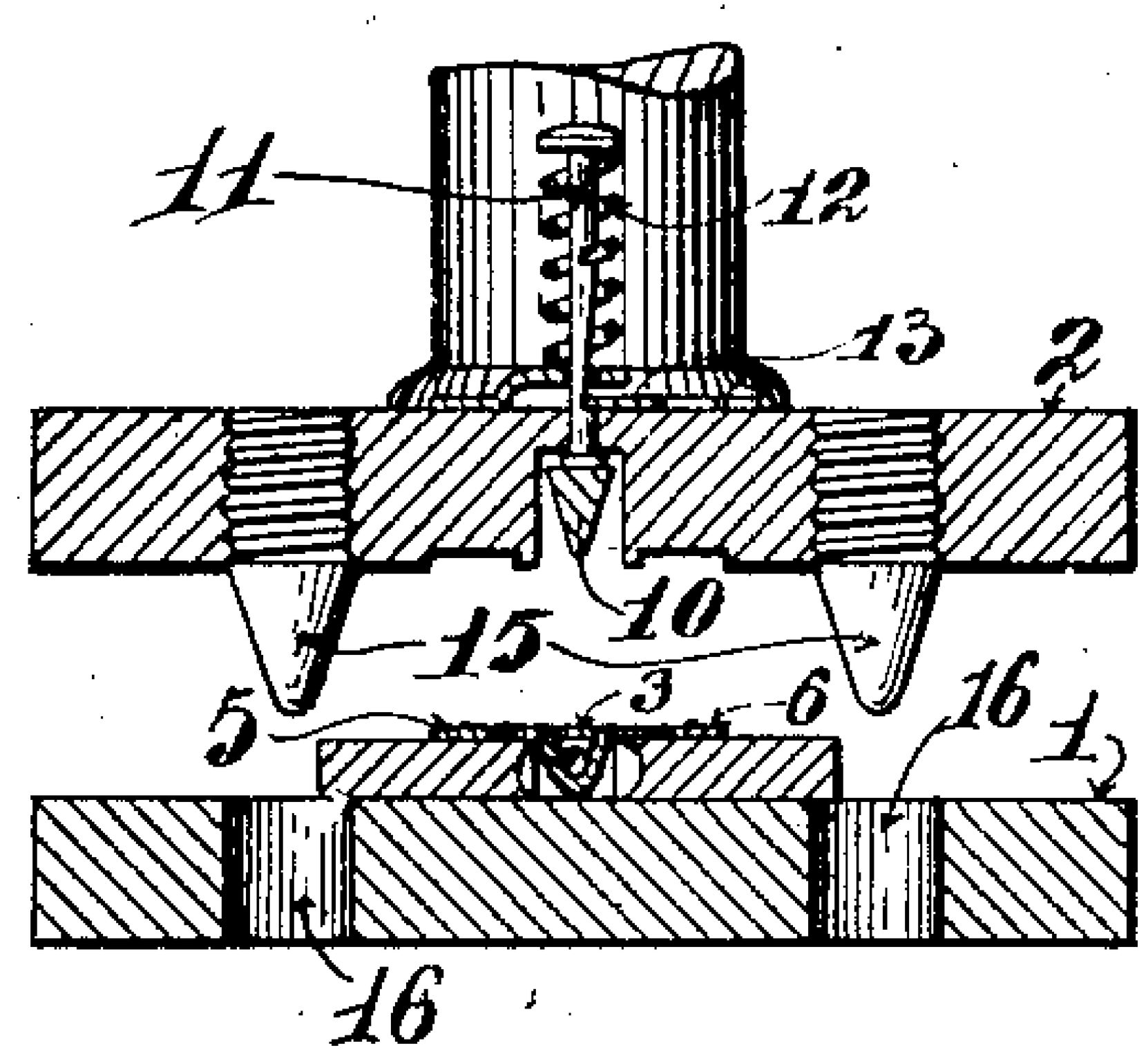


Fig. 4.

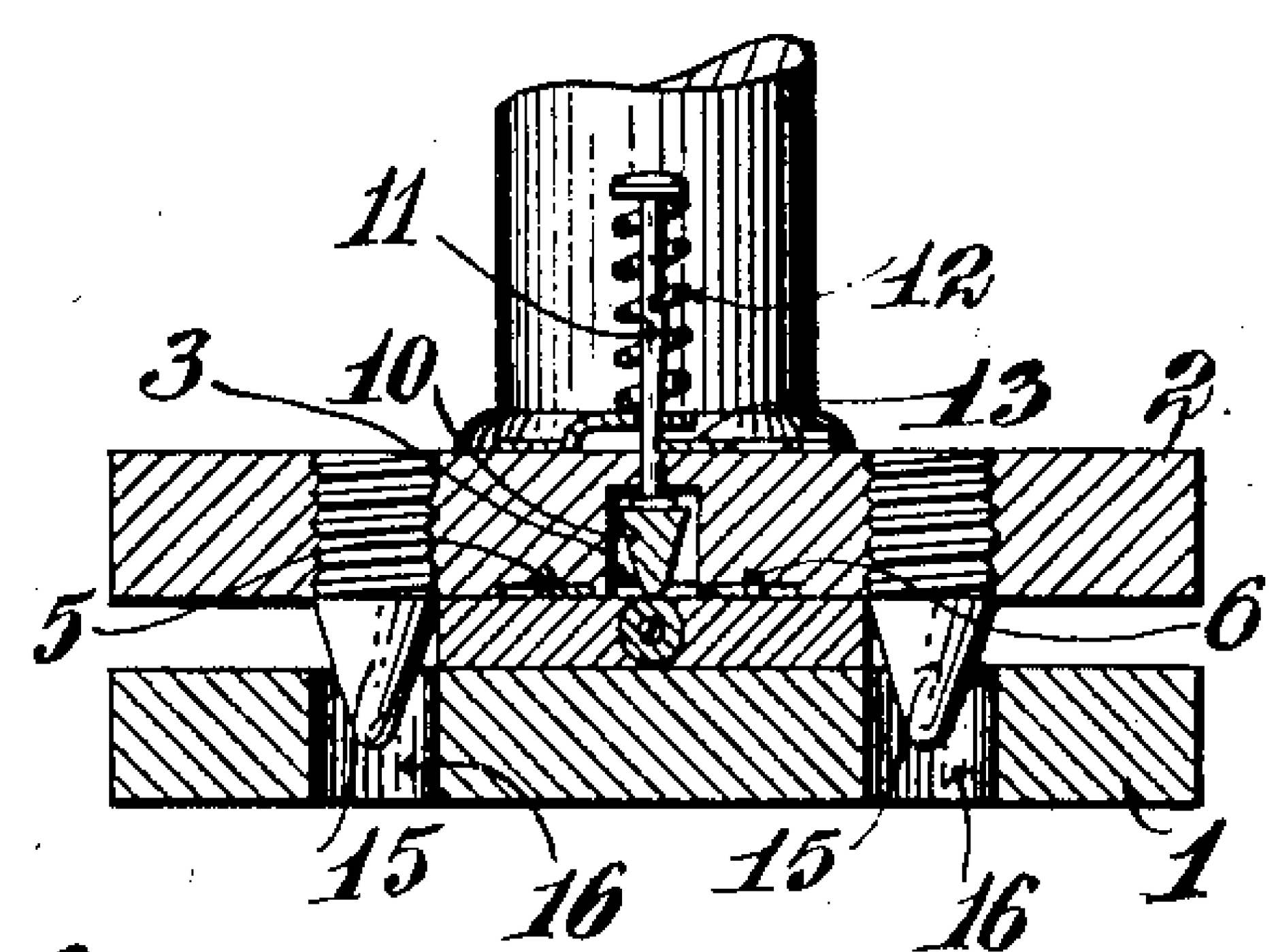


Fig. 6.

Fig. 5.

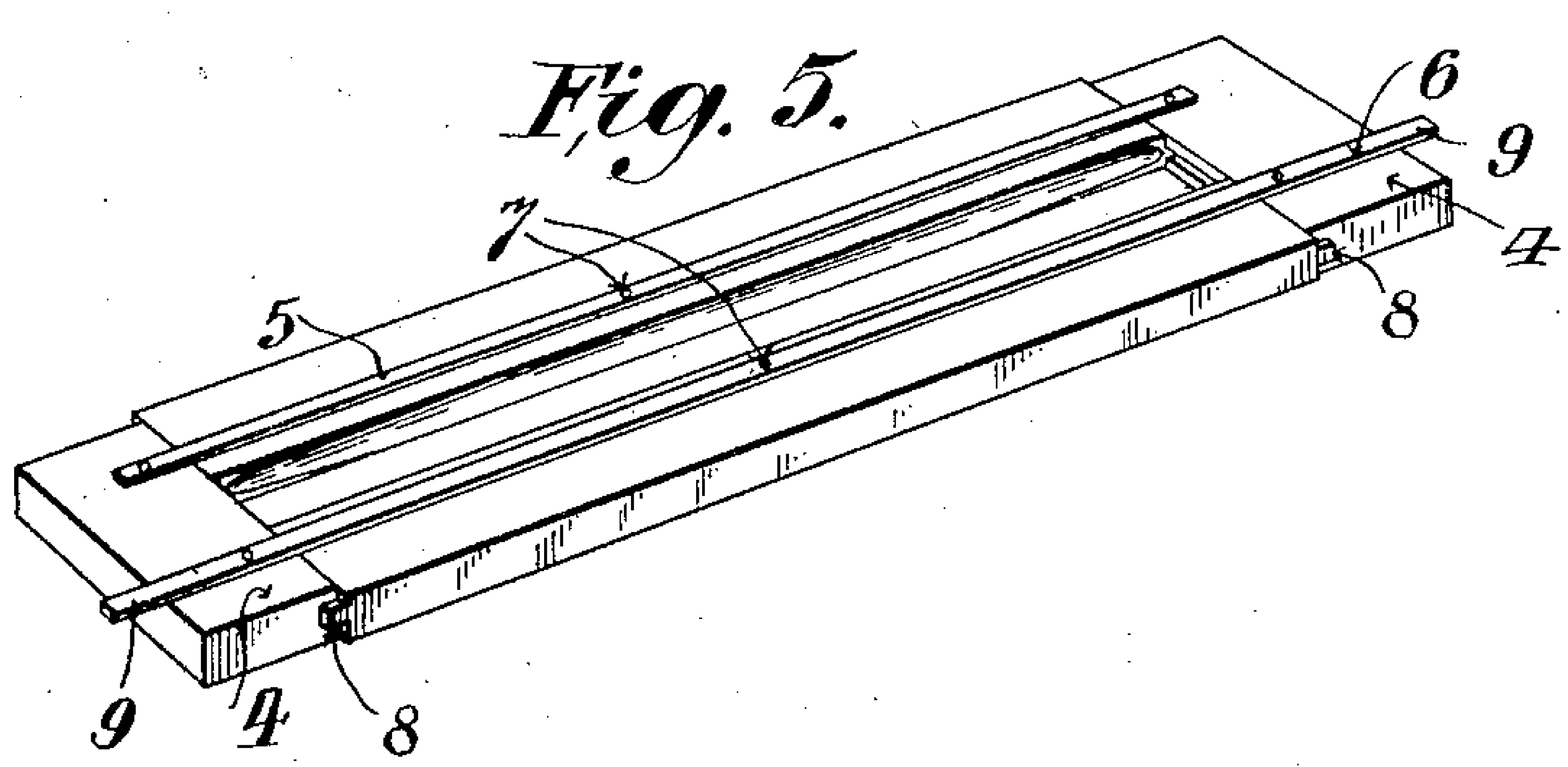
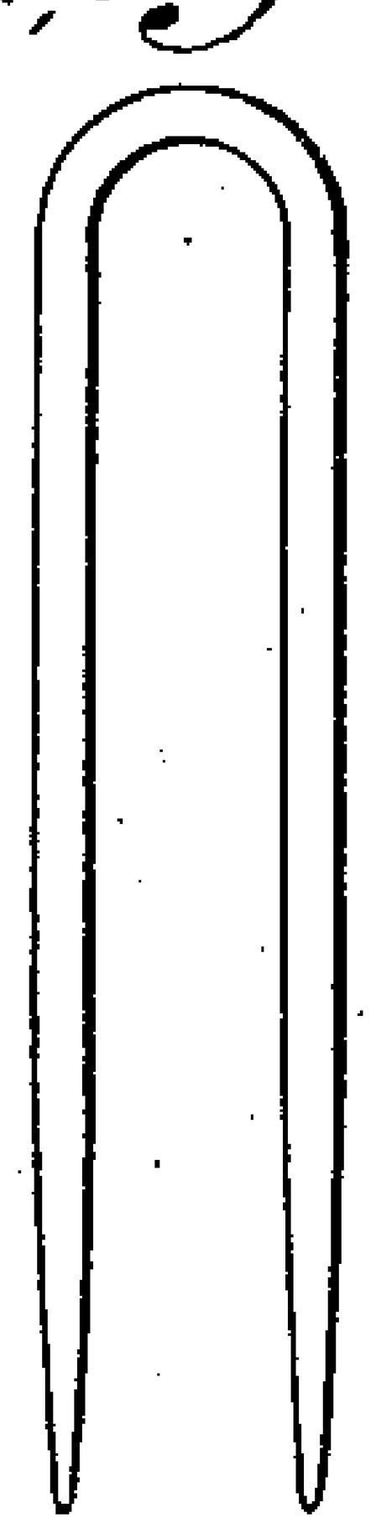


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES J. LEYERS, OF EAST RUTHERFORD, NEW JERSEY.

APPARATUS FOR MAKING WIRE-CORE HAIR-PINS.

No. 814,058. Specification of Letters Patent. Patented March 6, 1906.

Application filed June 7, 1904. Serial No. 211,476.

To all whom it may concern:

Be it known that I, CHARLES J. LEYERS, a citizen of the United States, residing at East Rutherford, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Making Wire-Core Hair-Pins, of which the following is a full, clear, and concise description.

This invention relates to the manufacture of hair-pins, and more particularly to the construction of hair-pins of plastic material reinforced by a central longitudinal core of wire embedded in or formed into the same, whereby the article is strengthened against fracture and is capable of various useful manipulations, the object of the invention being more especially to produce a hair-pin of celluloid in imitation of tortoise-shell or amber which may be readily bent into any desired shape without danger of cracking or breaking or other deterioration.

Referring to the accompanying two sheets of drawings, which form a part of this specification, Figure 1 is a view in perspective of an apparatus for making the article. Figs. 2, 3, and 4 are transverse vertical sections on the line *a a* of Fig. 1, showing said apparatus in successive stages of operation upon a blank. Fig. 5 is a detail and modification of the frame and forming-dies, and Figs. 6 and 7 are respectively the article straight and bent.

The apparatus comprises a lower block 1, which is preferably mounted, as a platen, upon a fixed support, and an upper block 2, which may be moved toward the lower block by any suitable mechanism, such as a system of levers operated by a foot-treadle, the said block being supported by a central pillar guided in the framework to permit of such movement. The lower block or platen 1 is provided at its opposite ends, respectively, with a headed stud 3, and the frame containing the forming-dies is adapted to be inserted upon the block under the heads of said studs, as shown in Fig. 1. The said frame comprises two end pieces 4, united by a pair of spring-straps 5 and 6, and the forming-dies are disposed between the end pieces and under the straps, being permanently united to the latter by screws or rivets 7 at substantially their central points.

The forming-dies are identical in shape and construction and may be provided with flat end faces in contact with the flat sides of the end pieces 4 4, as shown in Fig. 1, or they may be provided with a suitable dovetail or tenon 8, engaging in a corresponding channel or mortise in the sides of the end pieces, as shown in Fig. 5, or with other constructions of sliding support. The proximate faces of the two dies are provided with longitudinal grooves or cavities conforming to the desired shape of the finished hair-pin previous to being bent, and the side margins of the grooves are reduced to form knife-edges along their central portion.

The resilient straps above mentioned serve to hold the dies normally in the open position, (indicated in Figs. 1 and 5,) but permit them to approach and come into operative engagement with each other, as shown in Fig. 4, the resiliency of the straps being sufficient to retract the dies to their normal open position when the closing force has been removed. The proper position of the forming-frame under the heads of the studs 3 3 is gaged and determined by means of the end portions 9 of the strap 6, which are extended over and beyond the end pieces 4 and strike against the edge of the heads of the studs as the frame is inserted.

The upper or cam block 2 is recessed or channeled longitudinally on its under surface to receive the creaser-bar 10, which latter is preferably of slightly less length than the die-blocks and is supported by two vertical posts 11, extending upwardly therefrom through the roof of the recess and normally pressed in an upward direction by means of the spiral springs 12, interposed between the heads of the posts and suitable brackets secured to the block. The posts 11 are each provided with transverse notches adapted to be engaged by the spring-catches 13 for holding them, and consequently the creaser-bar, in a depressed position, protruding somewhat beyond the opening of the recess, the spring-catches 13 being provided with convenient thumb-pieces overlapping the end of the upper block. The tapered pins 15 at the four corners of the block 2 are adapted to enter the recesses 16 in the lower block a greater or less extent and upon a sufficient relative movement of the two parts are adapted to engage the backs of the forming-dies and cam or wedge them together.

In operation the two blocks 1 and 2 are first separated, and a strip of celluloid previously cut of the proper size and of uniform thickness for the work in hand is placed upon

the top of the forming-dies between the spring-straps above mentioned, the latter in normal open position, serving as gages for the proper placing of the strip. The creaser-bar is then depressed into the position shown in Figs. 1 and 2 by pressing upon the heads of the posts 11, the spring-catches falling into the notches in the latter and serving to hold the creaser-bar down. The two blocks 1 and 2 are then caused to approach a distance sufficient for the creaser-bar to engage the strip of celluloid and crease it or force it into the space between the two dies, as shown in Fig. 3, whereupon the catches 13 are operated to release the creaser-bar and allow the springs to house it within its recess, and a section of wire of slightly shorter length than the strip of celluloid is placed on the strip in the crease or groove thus formed. The upper block may then continue its movement toward the platen, and the taper pins 15, engaging the forming-dies, wedge the same together, as shown in Fig. 4. The last-described operation folds the celluloid closely around the core and forces the meeting edges of the strip into intimate contact with each other, the superfluous stock being severed and removed by the knife-edges on the dies heretofore mentioned. At the reduced or tapered extremities of the grooves the plastic material is manifestly compressed to the greatest extent, the excess, if any, after compression being forced out between the meeting faces of the dies, leaving a thin fin on the article, which, however, may be easily removed. The compression and consequent toughening of the end portion is specially desirable because the core is most conveniently a section of ordinary wire of uniform diameter extending, preferably, very close to the tips of the hair-pin, so as to reinforce it for the greatest possible portion of its length, and the latter is therefore necessarily thinner at the tapered ends and would otherwise be correspondingly weaker and more liable to split.

It will be understood that during the above-described operations the celluloid, as well as the dies, has been kept properly heated in order to preserve the requisite degree of plasticity and produce a union of the edge. Upon the recession of the block the resiliency of the spring-straps separates the dies and the article may be removed. The single seam formed by the united edges is preferably further bonded, and any cracks or crevices which may be present are permanently filled in and insured against liability of subsequent opening by applying a suitable transparent cementing agent thereon, such as acetic acid or acetic acid in which pieces of celluloid have been dissolved. The coated wire is then laid aside to dry and after drying is polished on a buffer-lathe and then bent into the shape of a U, as shown in Fig. 7, with the seam inside, this disposition of the seam being preferred because it is the weakest part of the covering and is thus most securely protected.

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

1. In apparatus for making hair-pins, a forming mechanism comprising a frame having a flexible side member uniting two end pieces, a die movable between said end pieces and fastened to said resilient member in combination with a corresponding die and means for moving said dies relatively toward and from each other.

2. In apparatus for making hair-pins, a die-frame composed of two end pieces united by spring-straps and a forming-die fastened to each strap between said end pieces, said dies being disposed for relative movement with respect to themselves and said end pieces.

3. In apparatus for making hair-pins, a frame for supporting forming-dies comprising a pair of end pieces and flexible metal straps uniting said end pieces and permanently secured thereto at their opposite ends, said straps being provided with means of attachment to the forming-dies at substantially their mid-points.

4. In apparatus for making hair-pins, a folding and forming mechanism comprising a pair of relatively movable dies, end pieces between which said dies are confined and a pair of parallel flexible straps respectively joining the end pieces and connected to a die, said straps being normally disposed at a predetermined distance apart and serving as gages for the work.

5. In apparatus for making hair-pins, a die-frame composed of end pieces and straps secured to and joining them, relatively movable dies between said end pieces, one of said straps being extended beyond the end pieces and forming stops, in combination with a platen supporting said frame and projections on said platen for engagement by the stops.

6. In apparatus for making hair-pins, a platen and a pair of relatively movable forming-dies thereon, normally held in separated position, in combination with a creaser-bar adapted to enter between said dies to force the work therebetween and means for moving the dies into engagement to compress said work.

7. In apparatus for making hair-pins, a platen and a pair of relatively movable forming-dies thereon, a pair of spring members normally at a predetermined distance apart, fastened to said dies and holding them normally in open position, in combination with a creaser-bar adapted to enter between said dies and force the work therebetween and mechanism carrying said creaser-bar for forcing the dies together to compress said work.

8. In apparatus for making hair-pins, a

platen, relatively movable dies thereon in normally open position, a block having movement toward said platen and cam mechanism carried thereby for closing said dies, in combination with a creaser-bar normally housed within said block and mechanism for holding said bar projecting from its recess.

9. Apparatus for making wire-core hairpins, comprising a pair of relatively movable forming-dies, adapted to support a strip of sheet material over the gap between them when in open position, in combination with a creaser-bar and means for moving the same into said gap to bend the strip into V shape to receive the core, and means for closing said forming-dies upon the bent strip.

10. Apparatus for making wire-core hairpins comprising a pair of relatively movable forming-dies and gages for holding a strip of covering material over the gap between them, in combination with a creaser-bar adapted to coöperate with said dies to crease the strip longitudinally, and means for closing said forming-dies upon said creased strip.

11. Apparatus for making wire-core hairpins comprising a platen and a block having movement toward the same, a pair of forming-dies in said platen and means for holding a strip of covering material over the gap between them, in combination with means carried by said movable block for pushing said strip into the gap to thereby crease the same longitudinally, and means operated by said block to close the said dies together upon the creased strip.

In testimony whereof I have signed my name to the specification in the presence of two subscribing witnesses.

CHAS. J. LEYERS.

Witnesses:
H. G. KIMBALL,
WM. G. MCKNIGHT.