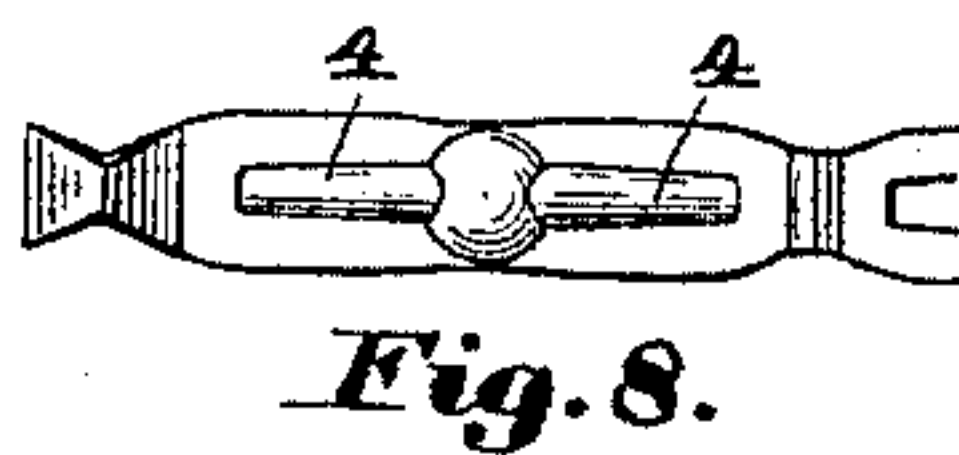
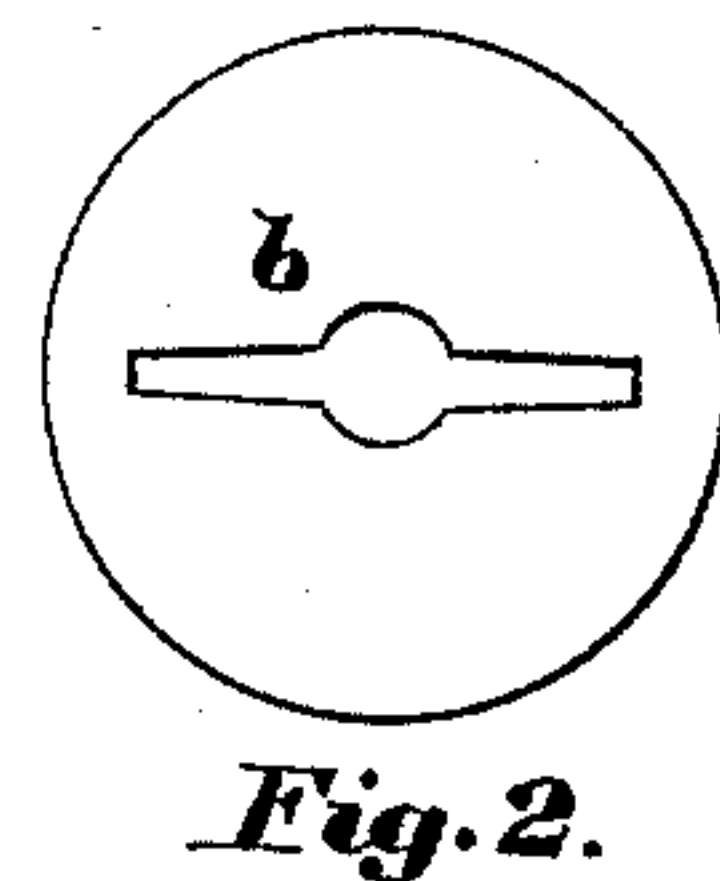
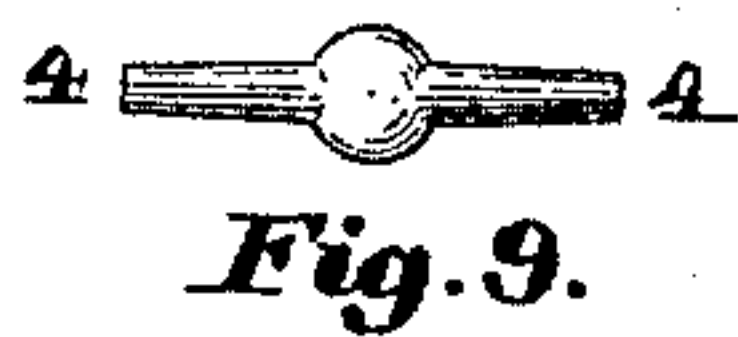
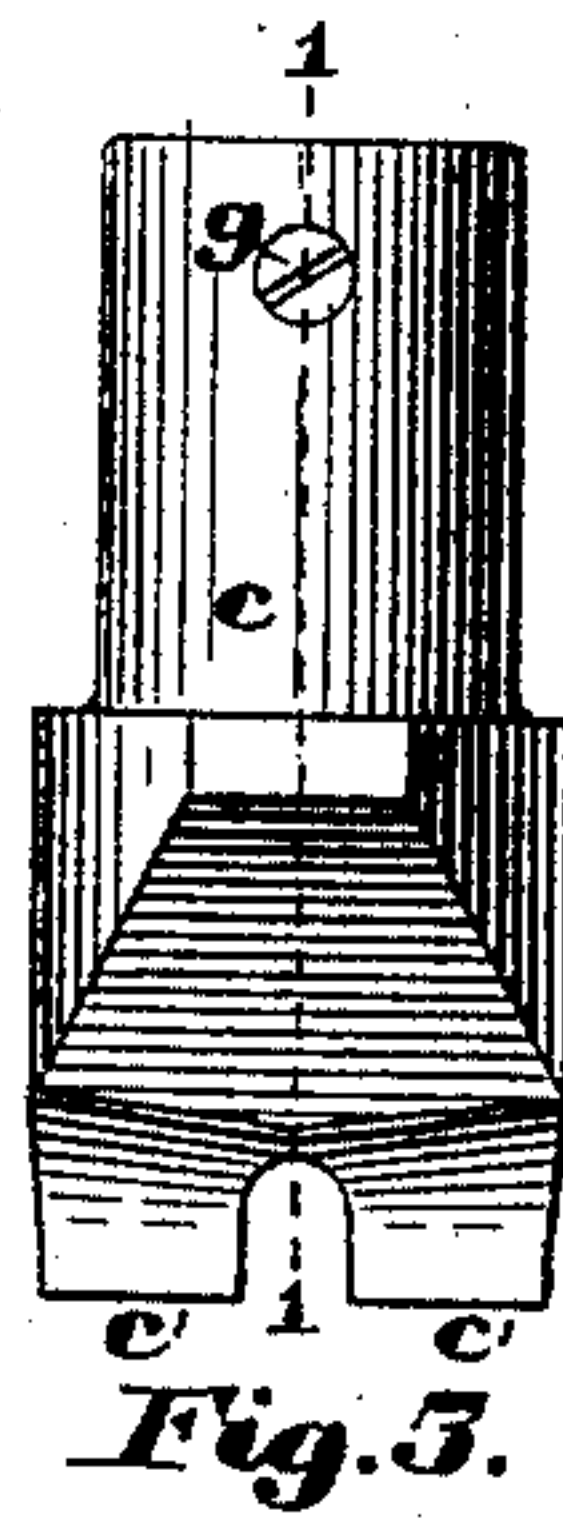
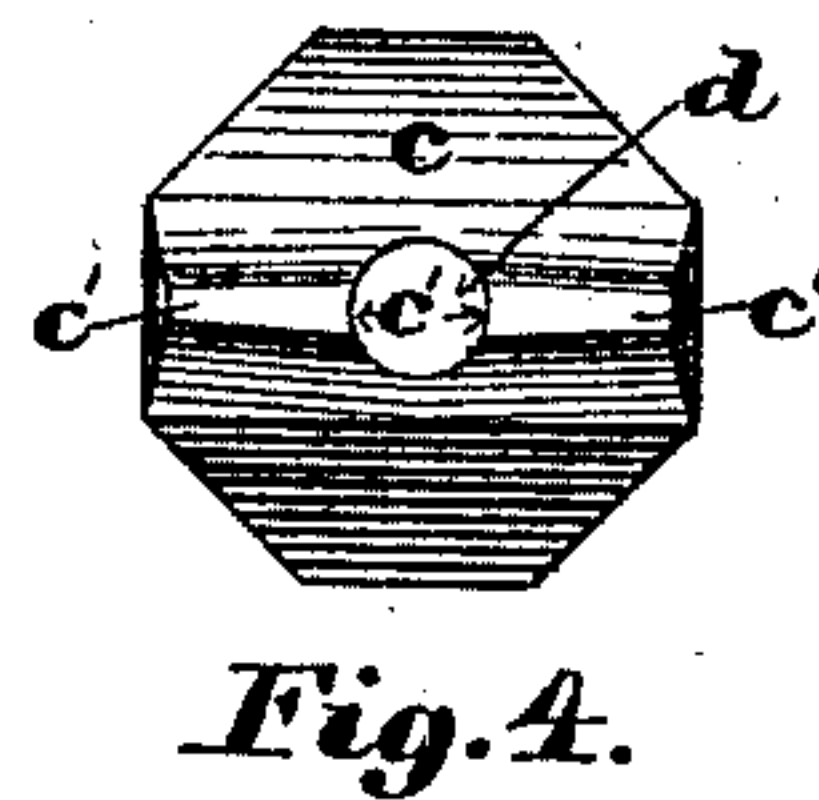
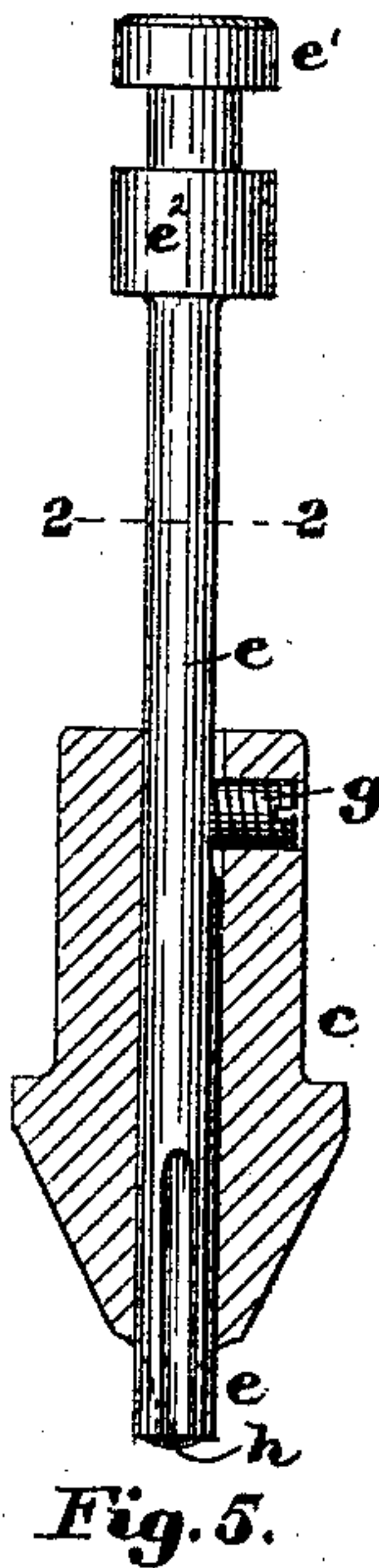
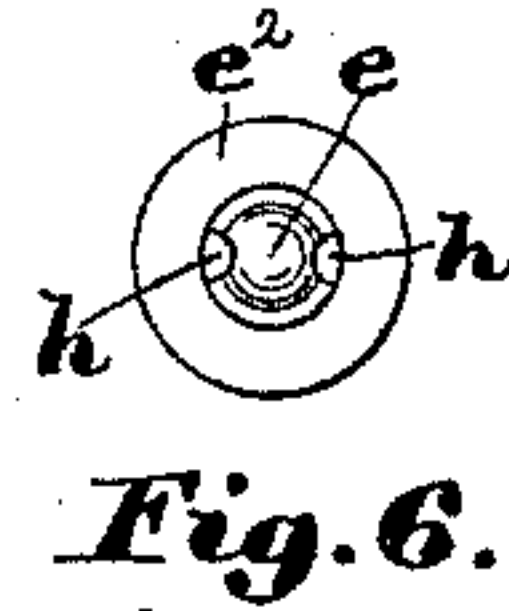
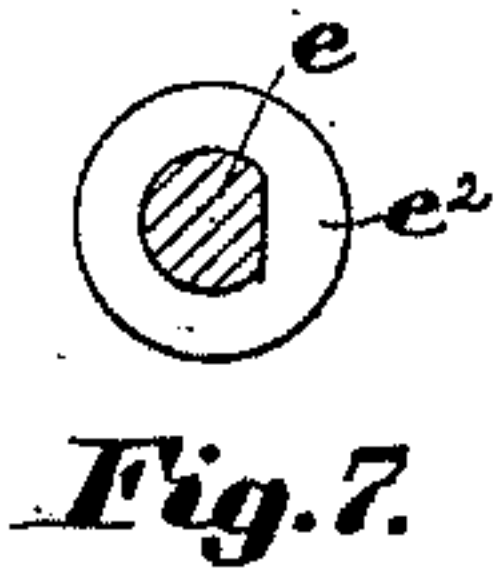
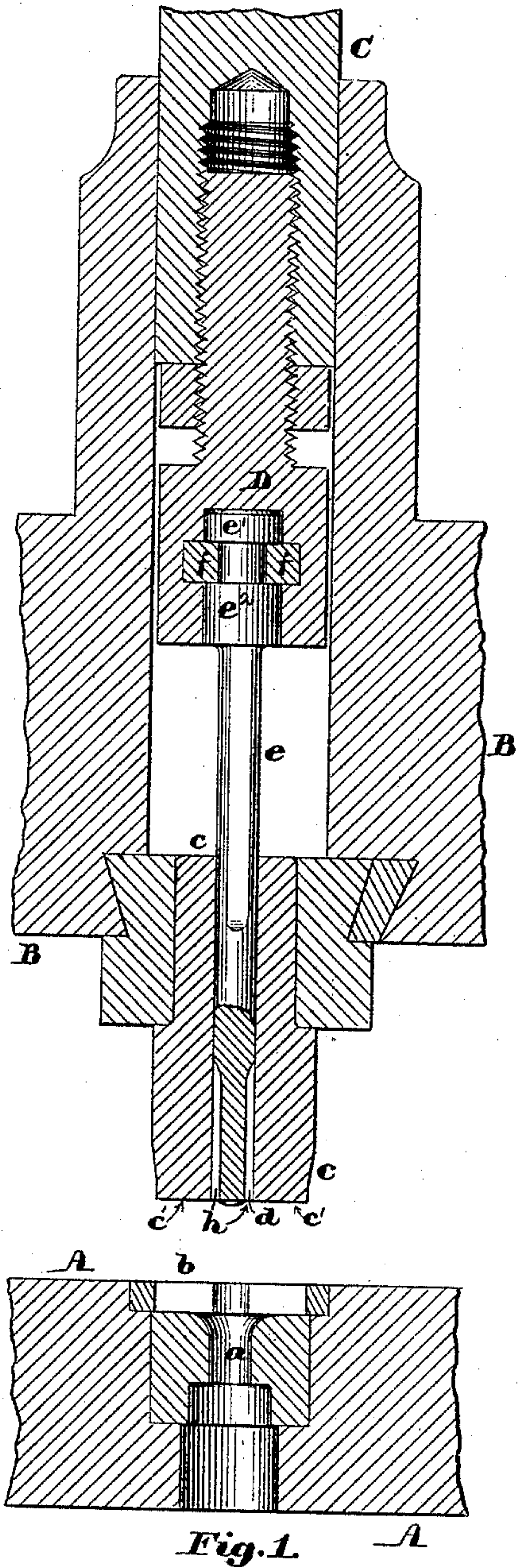


(No Model.)

M. N. BRAY.
MACHINE FOR FORMING RIVETS.

No. 436,332.

Patented Sept. 16, 1890.



Witnesses:
C. A. McClure
Walter E. Lombard.

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UNITED STATES PATENT OFFICE.

MELLEN N. BRAY, OF BROOKLINE, MASSACHUSETTS.

MACHINE FOR FORMING RIVETS.

SPECIFICATION forming part of Letters Patent No. 436,332, dated September 16, 1890.

Application filed June 27, 1890. Serial No. 356,929. (No model.)

To all whom it may concern:

Be it known that I, MELLEN N. BRAY, of Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Punching and Forming Dies, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to punching and forming dies for use in the manufacture of pronged rivets; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a central longitudinal section through a pair of dies and portions of the reciprocating plungers for operating the same. Fig. 2 is an elevation of the female punching-die. Fig. 3 is a plan of one part of the male punching-die. Fig. 4 is an end view of same. Fig. 5 is a longitudinal section of the same on line 1 1 of Fig. 3, with the other portion of the male punching-die, which also serves as the male forming-die, in elevation. Fig. 6 is an end view of the male forming and punching die. Fig. 7 is a section of same on line 2 2 on Fig. 5. Fig. 8 is a plan of a swaged blank, from which a pronged rivet is to be formed by the use of my improved dies, and Figs. 9 and 10 are respectively a plan and a longitudinal section of said blank after the surrounding fin of metal shown in Fig. 8 is removed.

The object of my invention is to facilitate the manufacture of pronged rivets of substantially the kind shown and described in Letters Patent No. 428,824, dated May 27, 1890, by trimming the fin from the swaged blank and bending the prongs at right angles to the head at one operation. To this end I construct the dies as illustrated in the accompanying drawings, in which A is the bed of a punching-machine, in which is set the female forming-die *a*, and the female cutting or punching die *b* in close contact with the forming-die *a*, as shown in the lower part of Fig. 1.

B is a portion of a cross-head arranged to be reciprocated on suitable slides or guide-

ways (not shown) by any suitable mechanism for imparting thereto the desired movement. (Also not shown.) The cross-head B is bored out to form a bearing for the plunger C, to which a suitable reciprocating motion is imparted by any suitable mechanism. (Not shown.)

The cross-head B has set in its forward end the male punching-die *c*, the cutting end of which is made to conform in shape in outline to the outlines of the prongs 4 4 of the rivet as viewed in plan in Fig. 9, and has bored longitudinally through its center the hole *d*, of a diameter corresponding to the diameter of the head of the rivet to be formed. The front end of the plunger C is bored out and threaded to receive the threaded shank of the die-stock D, to which is attached the spindle *e*, provided at its rear end with the two collars *e'* and *e''*, by which and the forked key *f f* it is held in position in said stock. The body of the spindle *e* is made cylindrical and of a diameter to fit the hole *d* in the die *c*, in which it has a bearing, as shown in Fig. 5. The spindle *e* has one side cut away for a portion of its length to form a flat surface, as shown in Fig. 7, against which the end of the set-screw *g*, set in the shank of the die *c*, bears to prevent said spindle being moved about its axis. The front end of the spindle *e*, which serves as the male forming-die and forms a part of the male punching-die, has formed in its periphery two channels or grooves *h h*, arranged parallel to each other upon opposite sides thereof and extending toward the rear, said grooves being of a shape in cross-section corresponding to the cross-section of the prongs of the rivet-blank that is to be formed thereby, as shown in Figs. 5 and 6. The spindle-die *e* is so arranged in the die *c* that the grooves *h h* formed therein are contiguous to the inner ends of the two cutting-faces *c' c'* of the die *c*, so that the outer corners of the faces *c' c'* and the corners of the die *e* from groove to groove shall constitute a complete cutting-corner of the outline of the opening in the female die.

The cross-head B and the plunger C are so connected to the operating mechanism (not shown) that they move in unison during the first part of their forward movement, so that

the ends of the dies *c* and *e* come in contact with the metal placed in front of them at the same instant and continue to move in unison until the blank is severed from its fin on the surrounding metal, when the motion of the die *c* ceases, while the forward movement of the die *e* continues, forcing the center of the blank into the female forming-die *a* and bending the two prongs of the blank at right angles to said central or head portion and causing them to lie in the grooves *h h* until they have been pushed through the die *a* and the die *e* begins to recede, when the rivet is stripped from said die and falls into any suitable receptacle.

I claim—

1. A punching and forming die comprising a female punching and a female forming die, placed one in front of the other and contiguous thereto, and a male die made in two parts arranged one within the other and each forming a portion of the cutting-corner to co-operate with the female cutting-die, and the cen-

tral constructed and adapted to co-operate with the female forming-die in shaping the article to be formed.

2. In dies for cutting the blanks for and forming pronged rivets, the combination of the female cutting-die *b*, the female forming-die *a*, contiguous thereto and in axial line therewith, the male cutting-die *c*, provided with the circular longitudinal perforation *d*, and the male forming and cutting die *e*, provided with the longitudinal grooves *h h* and fitted to and movable in the perforation *d* of the die *e*, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 24th day of June, A. D. 1890.

MELLEN N. BRAY.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.