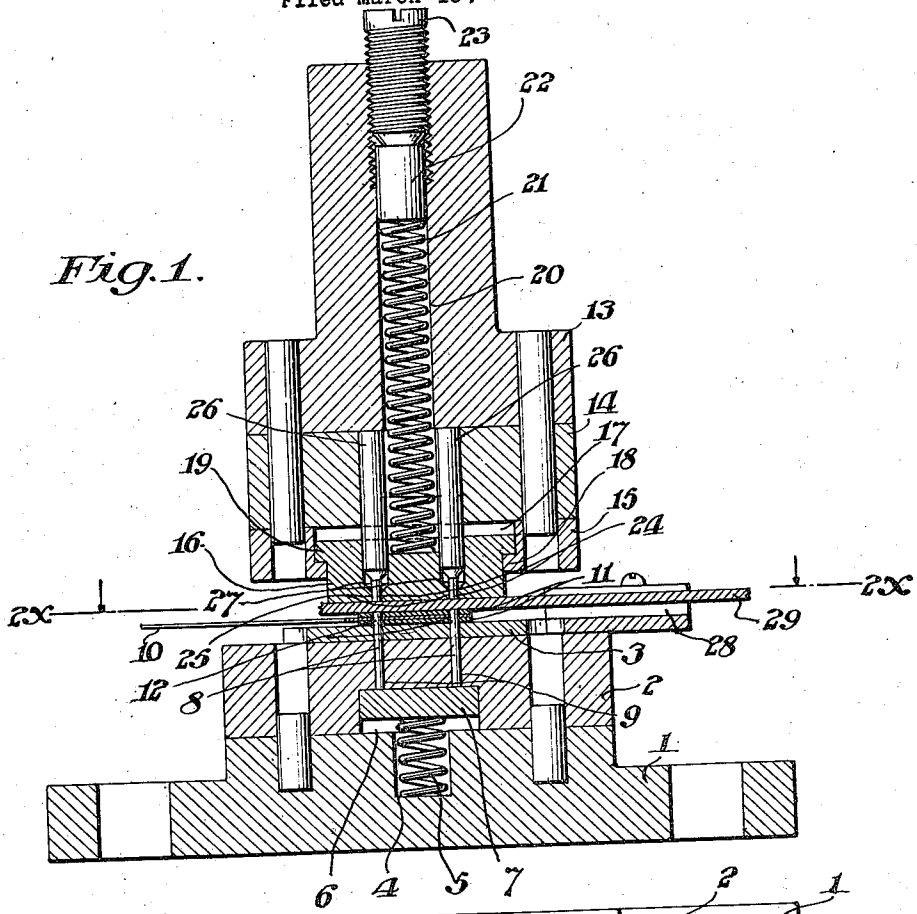
May 22, 1923. 1,456,079

H. STUEBNER

METHOD AND MECHANISM FOR CONTINUOUSLY PRODUCING AND SETTING RIVETS

Filed March 19, 1921

Fig. 1.



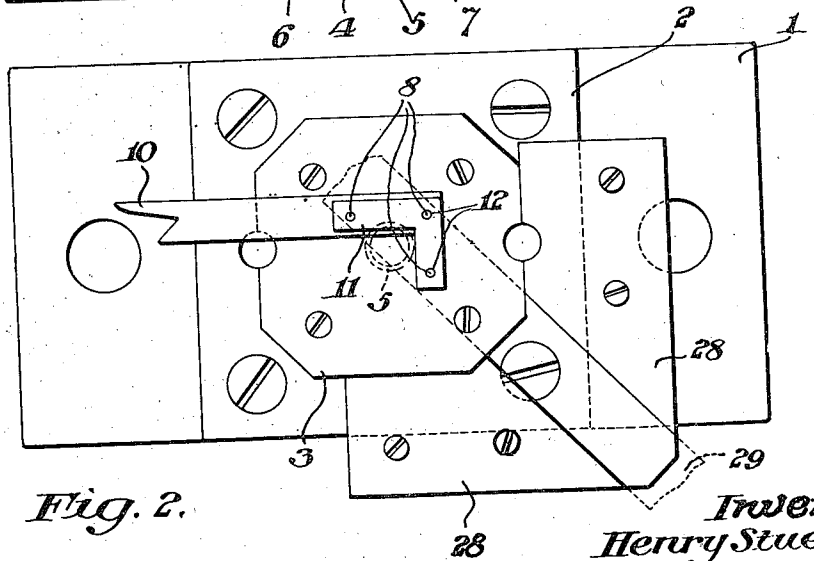


Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY STUEBNER, OF PHILADELPHIA, PENNSYLVANIA.

METHOD AND MECHANISM FOR CONTINUOUSLY PRODUCING AND SETTING RIVETS.

Application filed March 19, 1921. Serial No. 453,822.

To all whom it may concern:

Be it known that I, HENRY STUEBNER, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improved Method and Mechanism for Continuously Producing and Setting Rivets, of which the following is a specification.

This invention is a method and mechanism whereby sections are forced out of a metal blank into registering apertures of laminated members and there set to secure said members together.

The primary purpose of the invention is to provide improvements whereby riveting operations can be simplified and facilitated, by reducing to a minimum the operations required, the labor required and the necessity for skilled labor, while producing a finely finished product rapidly, efficiently and economically.

In the accompanying drawings, Fig. 1 is a vertical sectional view in illustration of mechanism comprised in my invention, and Fig. 2 is a plan view of a part of the construction shown in Fig. 1 lying below the line 2^x—2^x thereof.

The construction illustrated comprises a female die having a stationary bed 1 provided with detachable block 2 on which is secured a hardened steel plate 3, the bed being adapted for fixed connection with a suitable supporting device.

The part 1 contains the recess 4 in which is seated a coiled spring 5 and the part 2 contains the recess or way 6 in which is movable a plate or plunger 7 that is supported by the spring 5.

Guide pins 8 are movable in vertical ways 9 which extend through the parts 2 and 3. The pins are supported by the member 7, and in the upper position of this member, the pins project above the plate 3 to an extent sufficient for extending into or through and engaging together in proper registering relation the laminated members 10 and 11 containing the holes 12. In the present application of the invention, the parts 10 and 11 are members of sinkers for knitting machines.

A male die, adapted to cooperate with the female die, comprises the vertically reciprocatory block 13, the block 14 fixed to the bottom thereof and the block or plate 15 fixed to the bottom of the block 14. A plunger 16 is movable in the recess or way 17 which extends through the part 15, the latter having the inwardly projecting flange 18 which serves to guide the part 16 and limit its downward movement by engagement with its flange 19 thereon.

A passage 20, which, as shown, extends through the parts 13 and 14, contains a coiled spring 21 which acts against the back of the plunger and stripper 16. The top of the spring bears against a follower 22 which is adjustable by a set screw 23 to regulate the force exerted by the spring upon the plunger.

Punches 24, which extend through ways 25 in the plunger 16 in line with the pins 8, have their bodies 26 set in the block 14 with their upper ends in bearing relation to the block 13, these bodies playing in ways 27 of the plunger 16.

Guides 28, for a strip of metal 29, are fixed to the female die so as to guide the strip over the parts 10 and 11 and under the punches 24.

In operation, the parts 10 and 11 are placed on the plate 3 and on the pins 8, the pins being held in the elevated position and extending through the registering holes 12.

The strip 29 having been properly positioned on the parts 10 and 11 and over rivet holes 12, the male die descends, the plunger 16 engages the strip 17 and the punches 24 pass through the strip, cut or punch rivets therefrom, and force such rivets through the apertures 12 against the pins 8 which are retracted thereby, the tops of the pins being now held flush with the top of the plate 3 by the block or plunger 7 which now rests on the top of the bed 1.

The rivets thus subjected to pressure by the punches are expanded in the rivet holes and the laminated parts are fixed together thereby, the ends of the rivets being finished and flush with the surfaces of the parts 11.

Upon the completion of the riveting operation, the male die and the punches move upwardly a limited distance while the plunger is held by gravity and its spring against the work, the blank being thereby stripped from the punches. The further

upward movement of the male die carries the plunger with it, whereupon the operation is repeated.

Having described my invention, I claim:

1. The method which consists in placing an apertured device and a blank in contact, and punching a part clear out of said blank and expanding it in the aperture of said device by a continuous operation.

2. The method of riveting by a continuous operation which consists in punching the rivet out of a blank, carrying said rivet into registering apertures of the parts to be fixed together, and expanding said rivet in said apertures.

3. The method of riveting which consists in placing the parts to be riveted in juxtaposition with rivet holes therein in registration, placing a metal blank in juxtaposition to said parts over said holes, forcing metal clear out of said blank into said holes and upsetting said metal in said holes.

4. The method of riveting which consists in supporting the parts to be riveted in laminated relation with rivet holes therein in registration on a pin having a limited movement, placing a metal blank of substantially the thickness of said combined parts against one of said parts, forcing metal by means of a punch from said blank into said holes and thereby displacing said pin and expanding said rivet in said holes by the opposed action of said pin and punch thereon.

5. The mechanism which comprises a supporting device, a pin having a limited movement in said device, a punch movable in alignment with said pin and adapted to coact therewith in a riveting operation.

6. The riveting mechanism which comprises a stationary device, a reciprocatory pin having a limited movement therein and means movable in said device for holding said pin at one limit of its movement and for returning it automatically to the other, in combination with a reciprocatory punch in alignment with said pin.

7. The riveting machine which comprises a stationary die mechanism, a device for holding parts in registration and a rivet therein, said device adapted to reciprocate in and to project from said mechanism, and means movable in said mechanism for automatically projecting said device therefrom and limiting the retraction of the same therein, in combination with a reciprocating die mechanism provided with a punch in alignment with said device, and means having a limited movement of reciprocation relatively to said reciprocating die mechanism and on said punch, for stripping the latter.

8. The riveting machine which comprises a stationary die mechanism, a pin for holding parts in registration and a rivet therein, said pin adapted to reciprocate in and to project from said mechanism through parts supported thereby, and means comprising a spring movable in said mechanism for automatically projecting said pin therefrom and limiting the retraction of the same therein, in combination with a reciprocating die mechanism provided with a punch in alignment with said pin, a plunger carried by and having a limited movement of reciprocation relatively to said reciprocating die mechanism and on said punch, said plunger adapted for engaging material adapted to be operated on by said punch and to strip said material from said punch, and a spring for augmenting the weight of said plunger.

Signed at Philadelphia, in the county of Philadelphia and State of Pennsylvania, this 16th day of March, 1921.

HENRY STUEBNER.