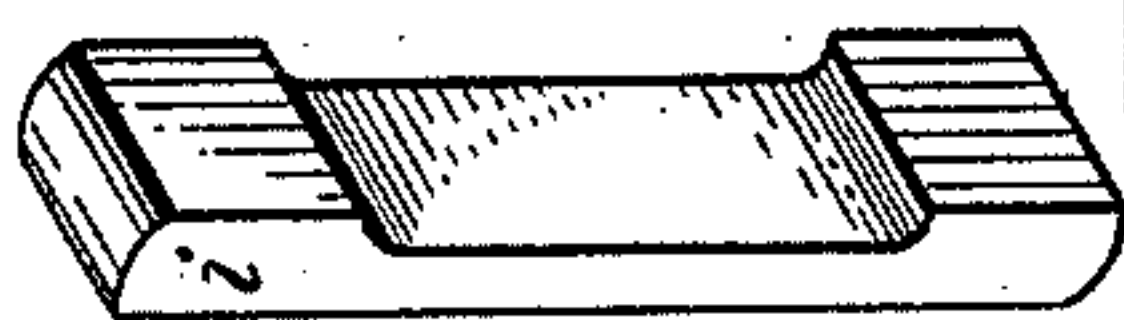
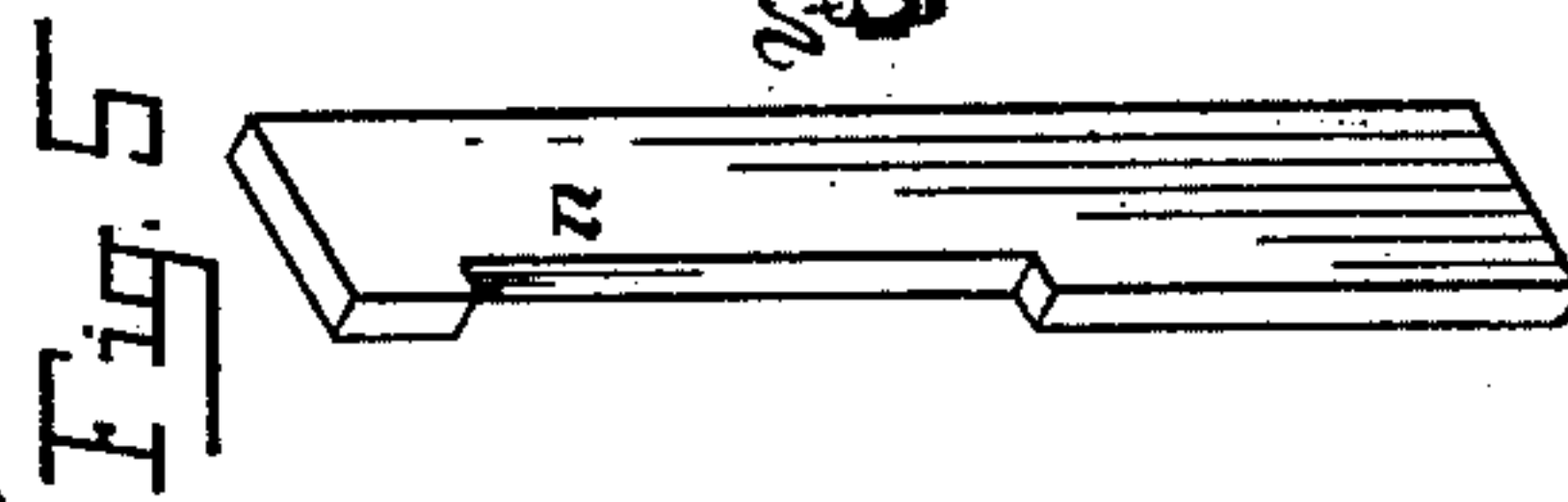
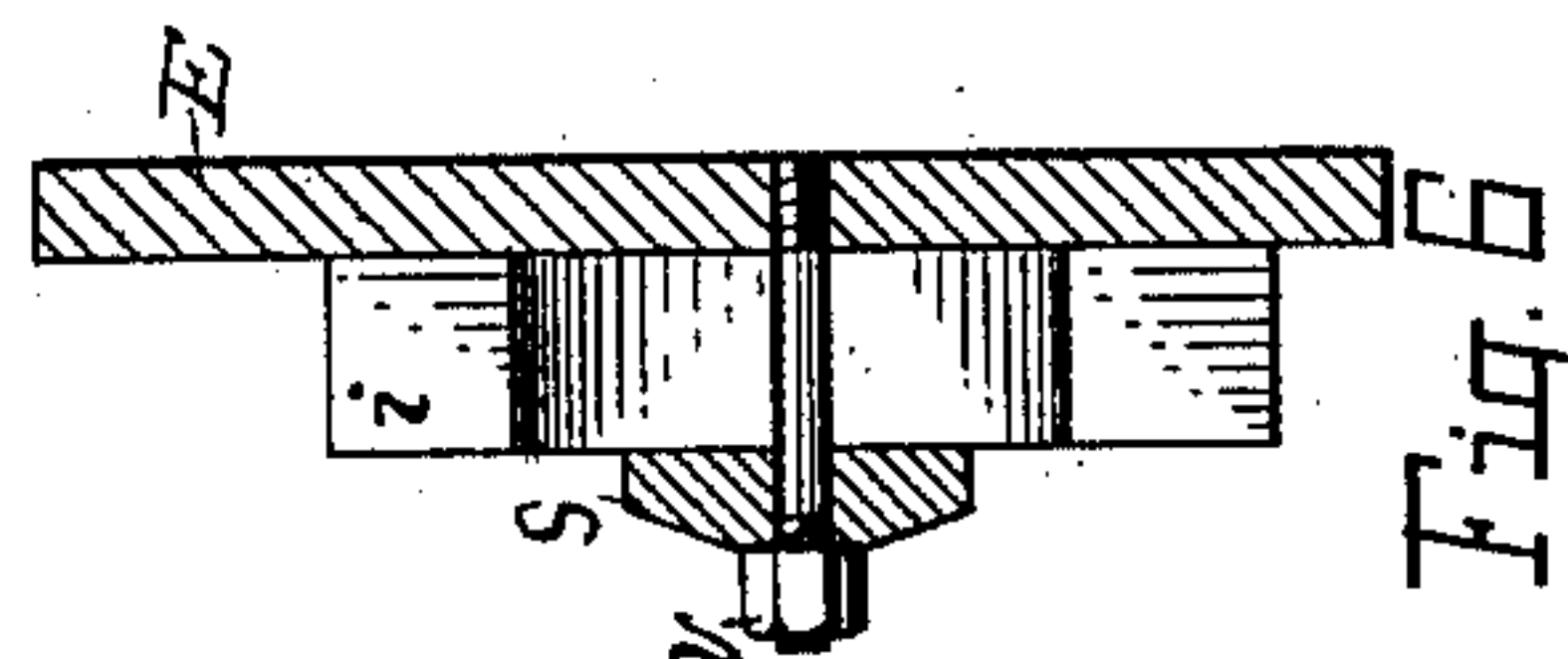
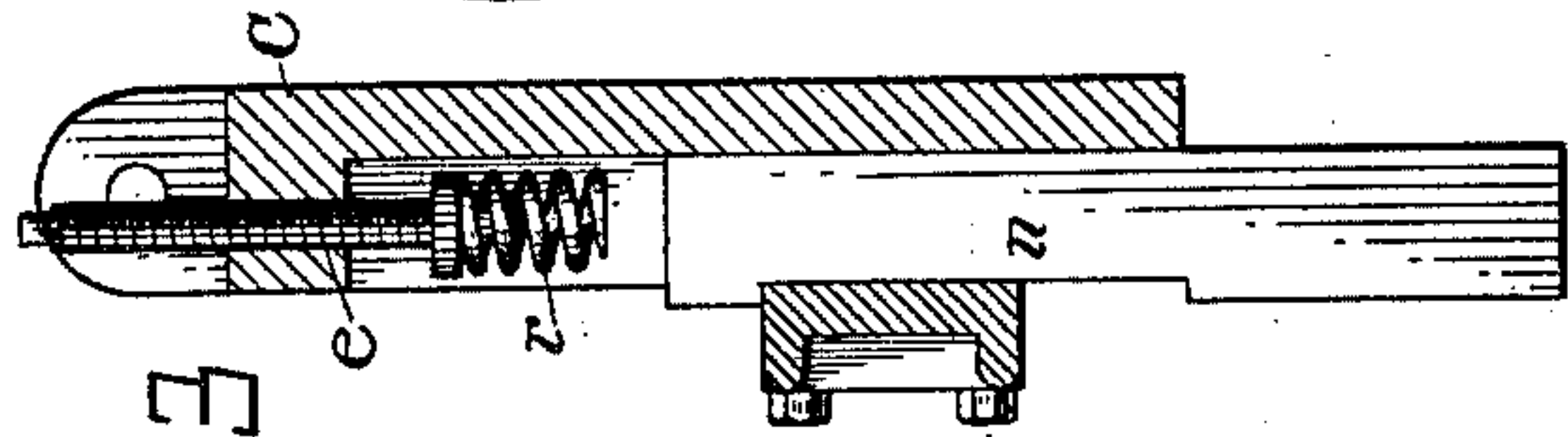
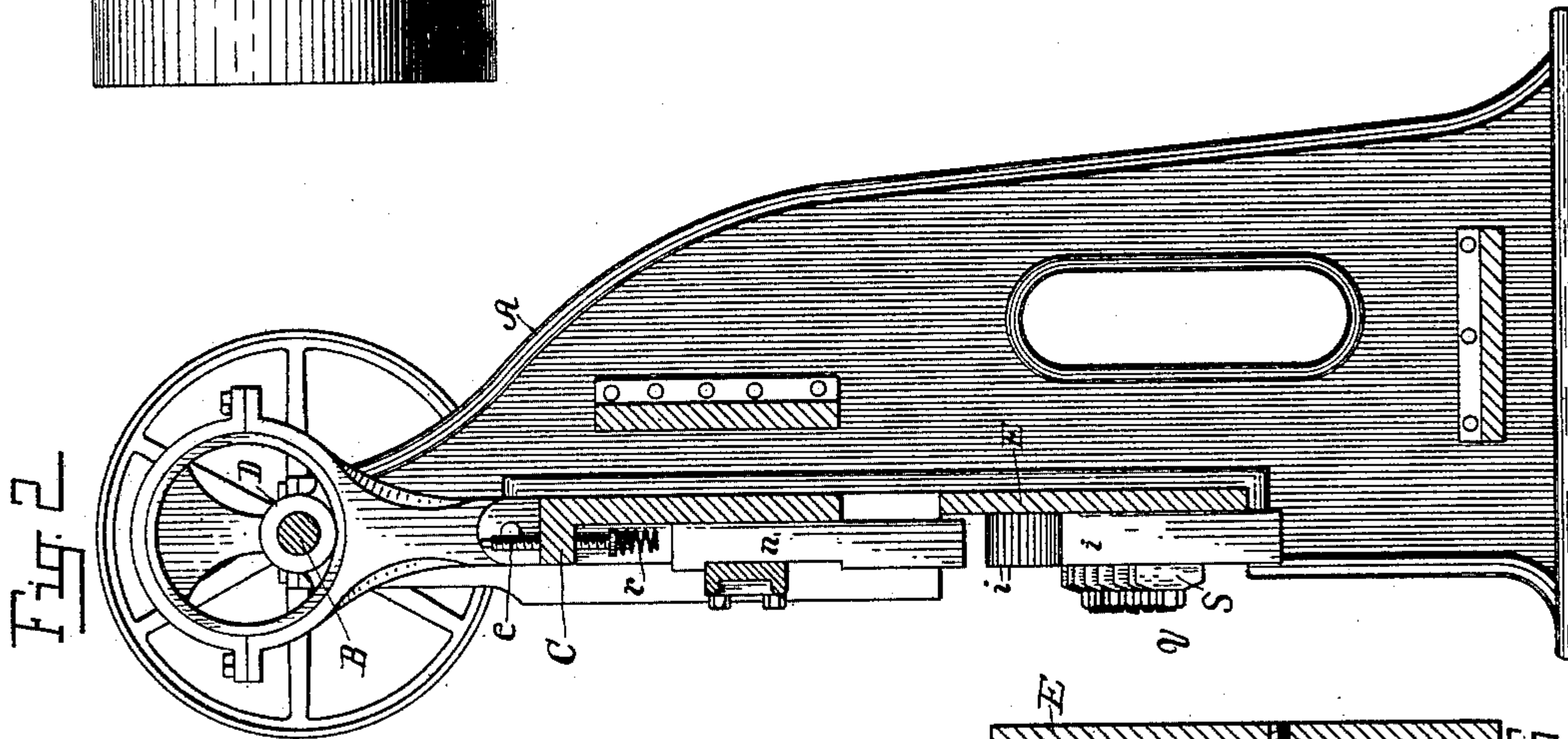
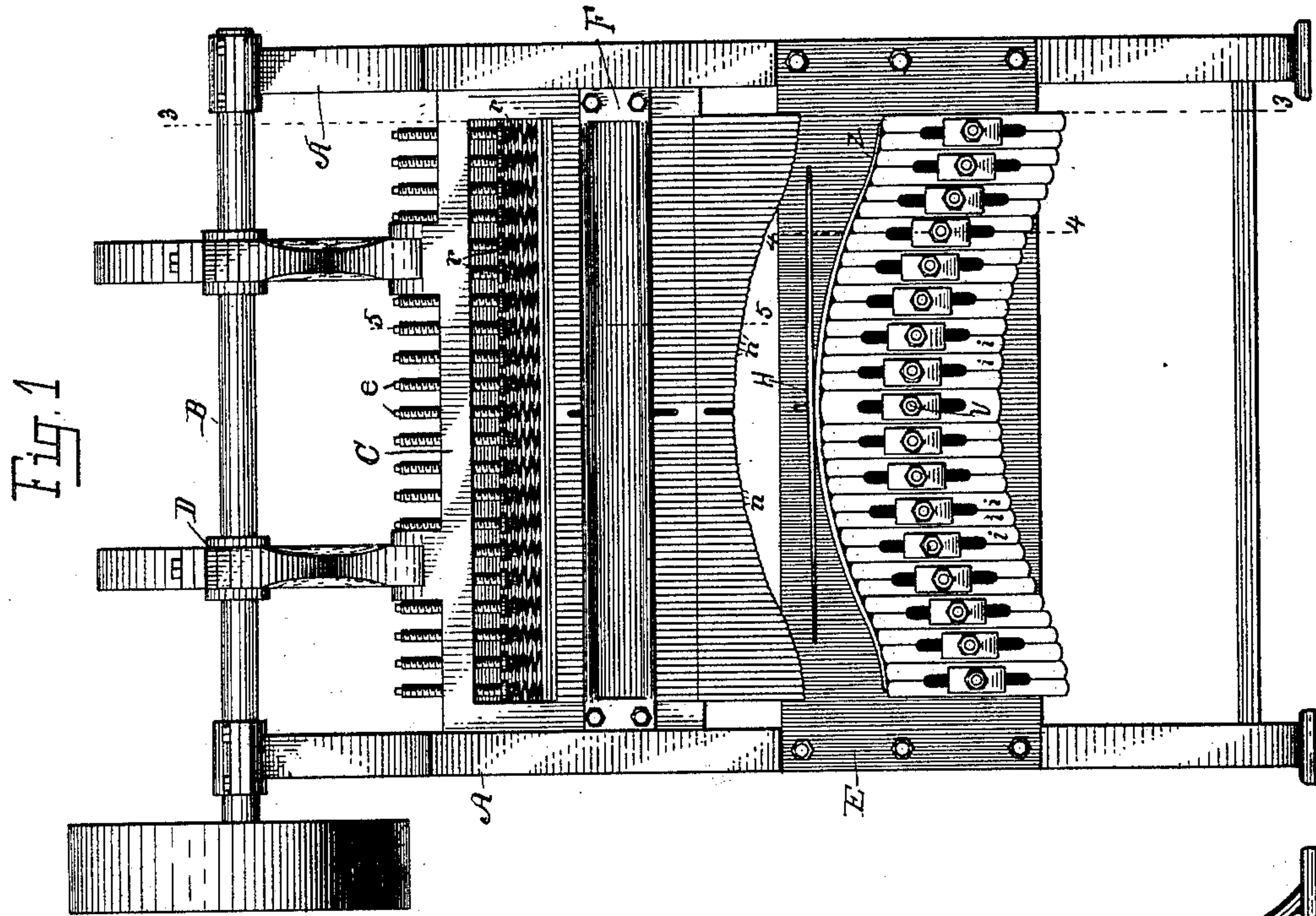


(No Model.)

J. E. BIDWELL.  
SPRING BENDING AND FITTING MACHINE.

No. 462,647.

Patented Nov. 3, 1891.



Witnesses:

Walter S. Wood  
Marion S. L. year.

Inventor.

Joseph E. Bidwell  
By Lucius C. West  
Att'y.



# UNITED STATES PATENT OFFICE.

JOSEPH E. BIDWELL, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO THE  
KALAMAZOO SPRING AND AXLE COMPANY, OF SAME PLACE.

## SPRING BENDING AND FITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 462,647, dated November 3, 1891.

Application filed May 25, 1891. Serial No. 393,931. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH E. BIDWELL, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Spring Bending and Fitting Machine, of which the following is a specification.

This invention relates to that class of spring bending and fitting machines in which two sets of dies are employed, each arranged to present a surface between which the spring is to be compressed, which surfaces conform to the general configuration of the spring.

The object of this invention is to employ (in connection with a suitable bed, upon which the spring to be fitted is placed) vertically-playing hammers arranged in a vertically-playing frame and adjustable spring-cushions for said hammers.

In the drawings forming a part of this specification, Figure 1 is a front elevation, looking from a point at the left of Fig. 2. Fig. 2 is a section on line 3 3 in Fig. 1, looking from a point at the right. Fig. 3 is an enlarged section on line 5 5 in Fig. 1, looking from a point at the right. Fig. 4 is an enlarged lettered detail in perspective, hereinafter described. Fig. 5 is an enlarged lettered detail in perspective, hereinafter described; and Fig. 6 is an enlarged section on line 4 4 in Fig. 1.

Referring to the lettered parts of the drawings, A is a frame-work of the machine, upon which is mounted in suitable bearings a power-shaft B.

At *i i* is shown a series of dies mortised in the side, as in Figs. 1, 4, and 6, so that when placed by the side of any like die there will be an elongated slot between the two contiguous dies. These dies are attached to a plate or bar E (which bar is secured to the frame A) by means of screw-bolts *v*, which bolts pass through washers S and through the slots and screw into the plate E. The object of these elongated mortises is to enable the operator to adjust the dies so that their upper ends will present a configuration in keeping with the desired shape of the spring to be acted upon. To illustrate, referring to Fig. 1, at *z* is shown a form made out of a metal bar conforming to the desired shape of the spring,

said form resting upon the ends of the dies *i*. If another form of spring were to be made, the screw-bolts *v* would be loosened and the dies adjusted in accordance with the peculiar shape of the springs desired. This series of dies *i* constitutes a bed or base against which the springs are compressed.

At C is shown a frame which has vertical slide-bearings in the frame A. Arranged in this frame is a series of vertically-playing dies or hammers *n*, (clearly shown in Figs. 2 and 5,) said hammers being so constructed and arranged that their lower surfaces present a shape conforming to the desired shape of the spring, or approximately so. These hammers *n* are mortised in one edge, as in Figs. 2 and 5, and the bar F is attached to the sliding frame C in a position to be within said mortises and limits the up-and-down movement of the hammers *n*. To illustrate, in Figs. 2 and 3 the hammers *n* are at their lowest position. Immediately above the hammers *n* are a series of spiral springs *r*, which springs are attached to the lower end of a series of stocks *e*, which stocks are screw-threaded and are adjustable in the screw-threaded hole in the upper bar of the frame C. The object of these springs *r* is to cushion the shock of the hammers when they come in contact with the spring H, which is to be bent and "fitted" to the form *z*.

The stocks *e*, which are provided with a spring *r*, have a wrench-seat at their upper end, and by this means they may be raised or lowered in accordance with the desired cushioning effect upon the hammers, the upper ends of which hammers *n* come in contact with the springs during the operation, since these hammers raise upward after they strike the spring H to be fitted.

In the operation the spring H to be fitted is placed upon the form *z*, as in Fig. 1, and the frame C, carrying hammers *n*, is then lowered by means of the eccentrics D upon the power-shaft B, or any other suitable means may be employed, which action bends the spring in the desired form and also "fits" it in the same manner in effect as though "pinched" by hand. During this action the upper ends of the hammers *n* come in contact

with the springs  $\tau$ , thus cushioning the shock and bringing the pressure upon the spring H, very similar, if not identical, in effect to the ordinary "pinching" when springs are fitted  
5 by hand, since the general operation forms the spring and the stroke of the upper hammers on the lower dies at different points thereto the length of the spring has a similar effect to the pinching referred to.

10 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

In a spring fitting and bending machine, the combination of a suitable bed, upon which  
15 the spring to be fitted is placed, a vertically-playing frame above said bed, a series of

screw-threaded stocks vertically adjustable in said frame and terminating at the lower end in cushioning-springs, and a series of hammers adjusted to play vertically in said  
20 vertically-playing frame between the bed and the cushioning-springs, whereby said springs will be brought in contact with the upper end of said hammers during the operation, substantially as set forth.

25 In testimony to the foregoing I have hereunto subscribed my name in the presence of two witnesses.

JOSEPH E. BIDWELL.

Witnesses:

F. V. WIEKS,  
JENNIE S. GOULD.