

No. 736,167.

PATENTED AUG. 11, 1903.

E. B. STIMPSON.
PUNCHING MACHINE.

APPLICATION FILED DEC. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

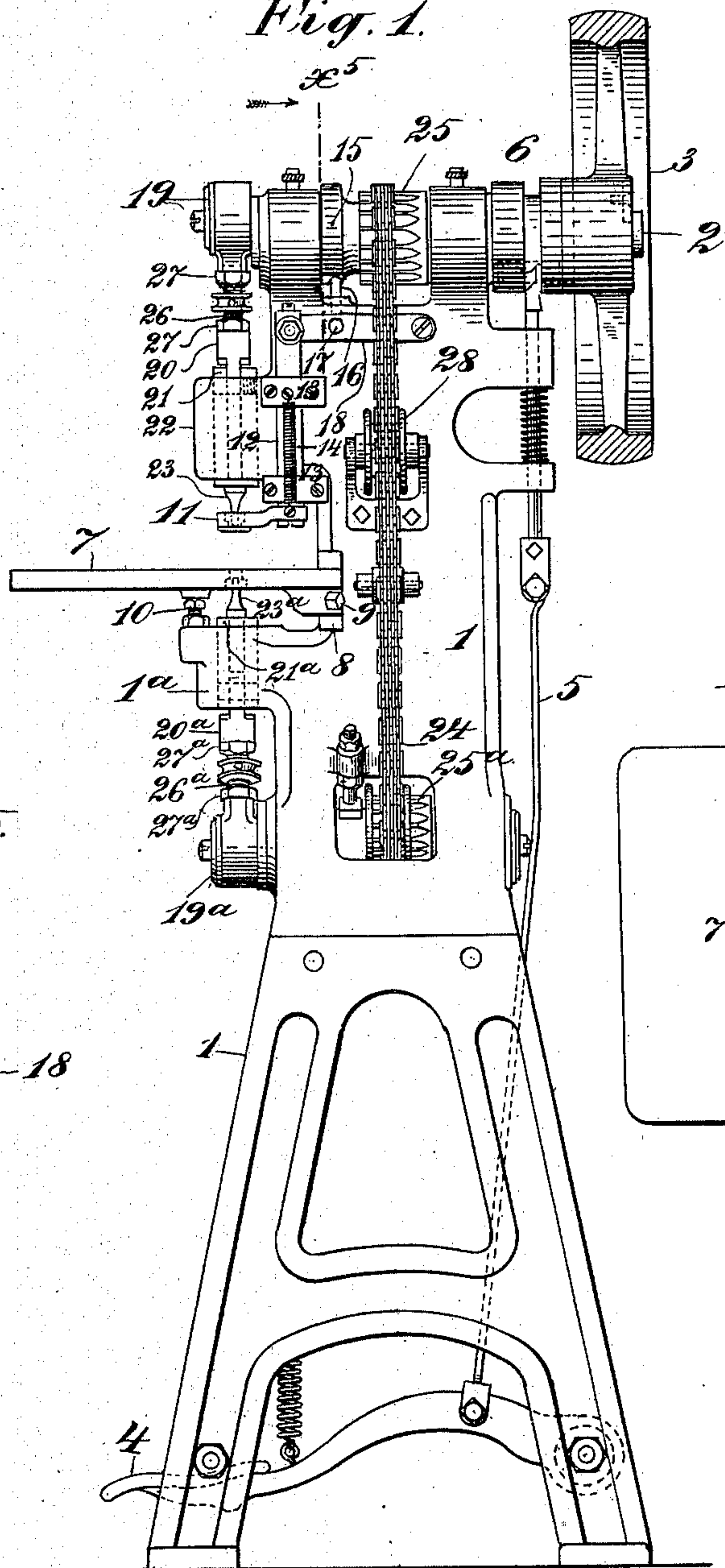


Fig. 6.

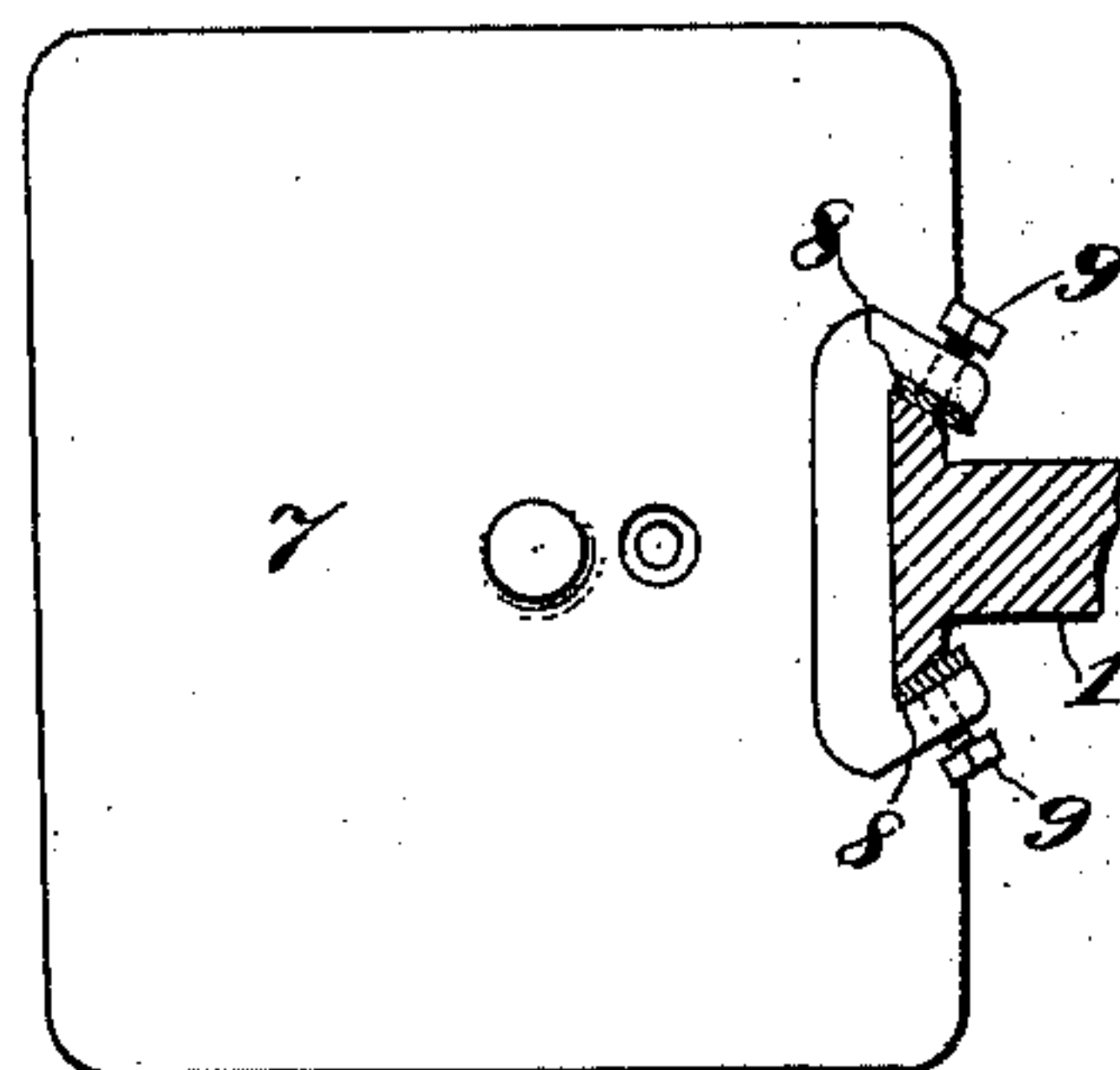
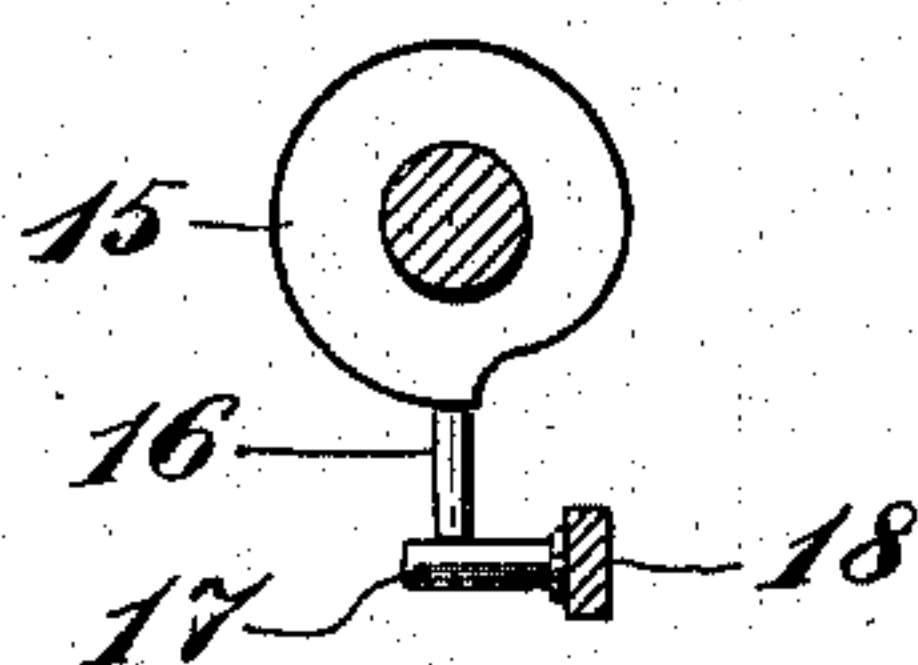


Fig. 5.



WITNESSES:

F. M. Higgins
J. A. Seemull

INVENTOR

Edwin B. Stimpson

BY

Henry Conner
ATTORNEY

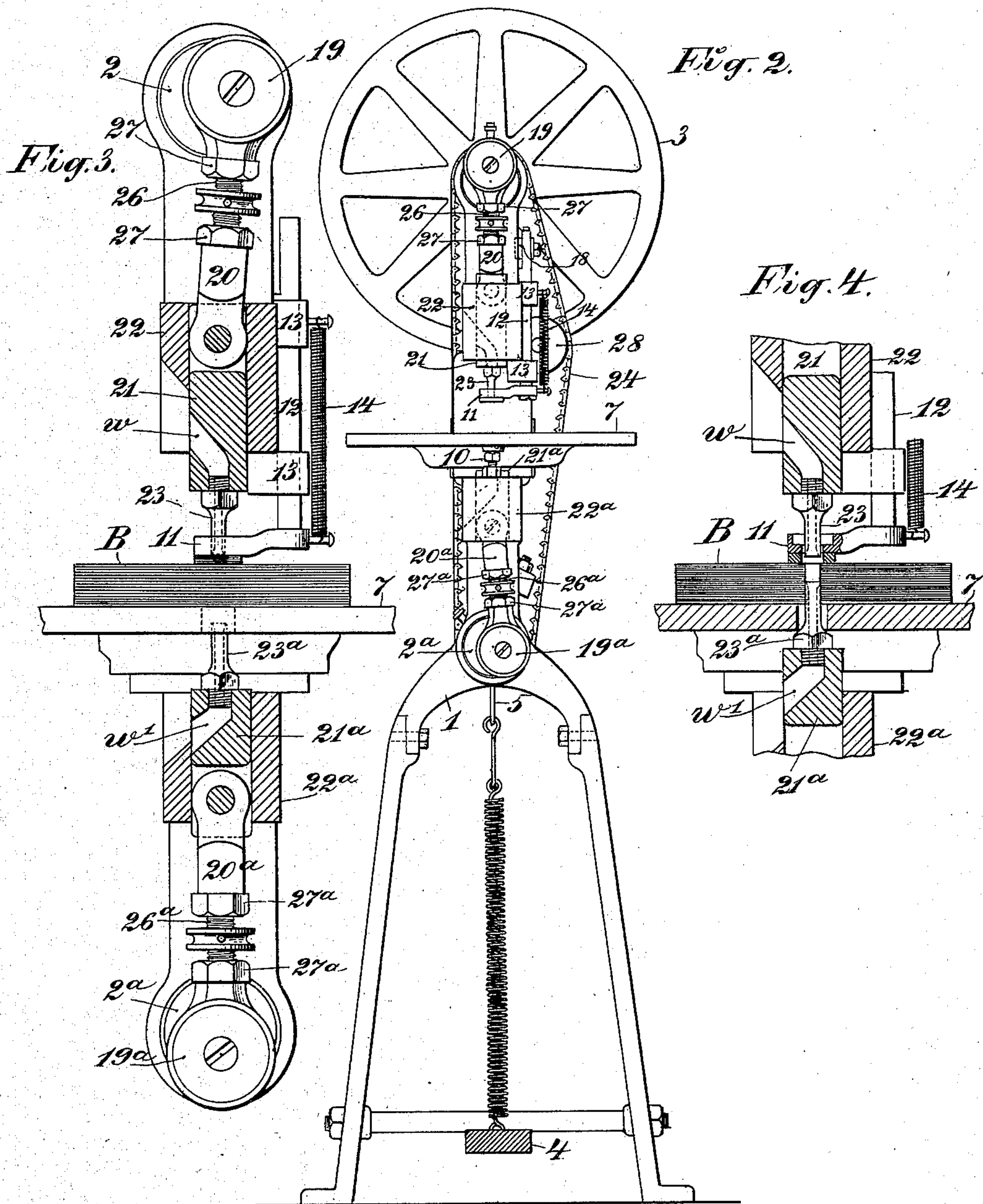
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2 SHEETS—SHEET 2.



WITNESSES:

J. H. Morris
J. A. Jewell

INVENTOR

Edwin B. Stimpson

BY

Henry Combs
ATTORNEY

UNITED STATES PATENT OFFICE.

EDWIN BALL STIMPSON, OF NEW YORK, N. Y.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 736,167, dated August 11, 1903.

Application filed December 29, 1902. Serial No. 136,941. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BALL STIMPSON, a citizen of the United States, residing in the borough of Brooklyn and county of Kings, in the city and State of New York, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

This invention relates to the class of machines with reciprocating tubular cutting-punches such as are commonly used for cutting paper and the softer materials; and the object is to provide a machine adapted for punching through thick masses of paper—as in books, for example.

In carrying out this invention a machine is employed which has two tubular cutting-punches axially aligned and moving generally in opposite directions—that is to say, the punches move in the main toward each other in punching and from each other in freeing themselves.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a side elevation of the machine, and Fig. 2 is a front elevation thereof. Figs. 3 and 4 are sectional elevations of the main operative parts of the machine, showing the punches in two of their operative positions. Figs. 3 and 4 are on a larger scale than the principal views. Fig. 5 is a face view of the cam which depresses the presser-foot, the view being substantially on section at x^5 in Fig. 1; and Fig. 6 is an under side plan view of the adjustable bed, showing how it is mounted on the frame.

1 designates a suitable frame, in which is mounted the main shaft 2 and on which is a driving-pulley 3. This pulley is loose normally, but may be coupled to the shaft for driving the latter through the medium of a treadle 4 and rod 5, which actuate a clutch at 6 in Fig. 1. This clutch device, pulley, treadle, and rod are known devices common in many machines and need not be illustrated and described in detail. It need only be said that when the operator depresses the treadle with his foot the coupling is effected and the shaft 2 makes one revolution and then stops. The bed 7 (see Figs. 1 and 6) has a dovetail guide-bearing at 8 on the frame, whereby it may be adjusted up and down and set when adjusted by a screw 9. The bed is supported

at its middle on an adjusting-screw 10, set in a bracket 1^a, formed on the frame.

11 is the presser-foot, the stem 12 of which has guides 13 on the frame. A spring 14 retracts or lifts the foot, and it is depressed by a cam 15, Fig. 5, on the main shaft 2. This cam bears on a pin 16, loose in the frame, and said pin bears below on a lateral arm 17 on a lever 18, fulcrumed on the frame and coupled at its free end to the stem of the presser-foot.

Figs. 3 and 4 show the punches and their operating mechanisms very clearly. On the end of the main shaft 2 is a crank-pin 19, to which is coupled a connecting-rod 20. At its other end this rod is coupled to a punch-holder 21, slidably mounted in a guide 22 in the frame. The upper punch 23, which is a tubular cutting-punch, is secured in the holder 21, and a way w is provided in the holder to permit of the escape of the punchings. The punch 23 passes down through an aperture in the presser-foot. In the frame below is mounted a counter-shaft 2^a, in the end of which is a crank-pin 19^a, to which is coupled a connecting-rod 20^a. At its other or upper end this rod is coupled to a punch-holder 21^a, slidably mounted in a guide 22^a in the frame. The lower punch 23^a, which is a tubular cutting-punch, is secured in the holder 21^a, and a way w' is provided in the holder to permit of the escape of the punchings. This lower punch plays up through an aperture in the bed and is of the same size as the upper punch. The two punches 23 and 23^a are axially aligned. One operates downward in punching and the other upward. The shaft 2 drives the shaft 2^a through a chain 24, which takes over two sprocket-wheels 25 and 25^a on the respective shafts 2 and 2^a.

So far as described the operation is as follows: B designates in Figs. 3 and 4 a book to be punched. Knowing the thickness of the books he proposes to punch, the operator sets up or down the bed 7 to suit the thickness, taking into account the extreme depression of the presser-foot, which must come to a firm bearing on the book. The book is placed on the bed while the presser-foot is uplifted by its spring and the two punches are retracted. The machine is set in motion, and as the upper punch descends the presser-foot also descends and comes to a firm bearing on

the book. Both punches enter the book, one from above and the other from below; but one is given a little lead by the setting of the cranks that operate them, so that one punch reaches the limit of its stroke, which may be a little more than half-way through the book, and starts to recede before the other reaches the limit of its stroke. Thus the two punches cut a clean hole through the book or mass of paper without coming into contact end to end. In the particular embodiment shown the upper punch has the lead of the lower punch and reaches the limit of its descending operative stroke, cutting a little more than half-way through the book before the lower punch reaches the end of its operative upstroke, and while the upper punch is receding the lower punch continues to advance until its cutting edge enters the hole made by the upper punch. This insures a clean-cut hole through the book or mass. The connecting-rods 20 and 20^a have each a means for slightly varying its length, and thus advancing the punch more or less to compensate for wear and for adjusting the punches. These adjusting devices consist of right-and-left screws 26 and 26^a of a well-known kind and jam-nuts 27 and 27^a thereon.

Obviously it is not important whether the upper or lower punch has the lead nor just what amount of lead it has, so long as it suffices to prevent collision between the punches. Obviously, also, it is not important that each punch shall have exactly the same length of travel or the same depth of cut. Preferably they will be so set as to cut practically the same depth and each so set as to penetrate a little beyond the half-way point in the thickness of the book or mass; but this is not essential to the invention.

Fig. 3 shows the positions of the parts when the presser-foot is in bearing on the book, the lower punch being fully retracted and the upper punch started on its forward movement to the extent of its lead. Fig. 4 shows the positions of the parts when the lower punch is at the end of its upstroke and is about to descend.

28 is a wheel which takes up slack in the chain 24 and holds it out clear from the frame.

As herein shown, the punches move in a vertical plane or path, and the machine has been so described; but this is not a feature that is essential to the invention. The punches

might move in a horizontal plane or path or in a plane inclined to the vertical.

Having thus described my invention, I claim—

1. A punching-machine having two alined and reciprocating punches which operate, for punching, in opposite directions, and means for operating said punches, one of the punches having lead and withdrawing as the other advances, whereby the overlapping and collision of the punches are avoided, substantially as set forth.

2. A punching-machine having two alined and reciprocating punches of substantially the same diameter which operate, in punching, in opposite directions, one of said punches having a lead over the other whereby their paths overlap without collision between or overlapping of the punches.

3. A punching-machine having two alined and reciprocating cutting-punches which operate, in punching, in opposite directions, one of said punches having a lead over the other whereby collision is prevented, an adjustable bed to support the mass or thing to be punched, a presser-foot, and automatic means for actuating said presser-foot.

4. In a machine for the purpose specified, the combination with an adjustable bed to support the thing to be punched, a presser-foot to bear on the same, a rotating cam and spring for automatically operating said presser-foot, two alined cutting-punches, and means for imparting reciprocating motion to said punches one in the lead of the other.

5. In a machine for the purpose specified, the combination with the frame, the bed mounted thereon, the main shaft, means for driving said shaft, the counter-shaft, means for driving the latter from the main shaft, the two alined cutting-punches and their guides, means between the respective shafts and the punches for imparting reciprocating motion to the latter, the presser-foot adapted to bear on the thing to be punched, and means for automatically operating said presser-foot.

In witness whereof I have hereunto signed my name, this 26th day of December, 1902, in the presence of two subscribing witnesses.

EDWIN BALL STIMPSON.

Witnesses:

PETER A. ROSS,
WILLIAM J. FIRTH.