

E. BAMBAUER.
PUNCHING MACHINE.
APPLICATION FILED MAY 26, 1909.

940,575.

Patented Nov. 16, 1909.
2 SHEETS—SHEET 1.

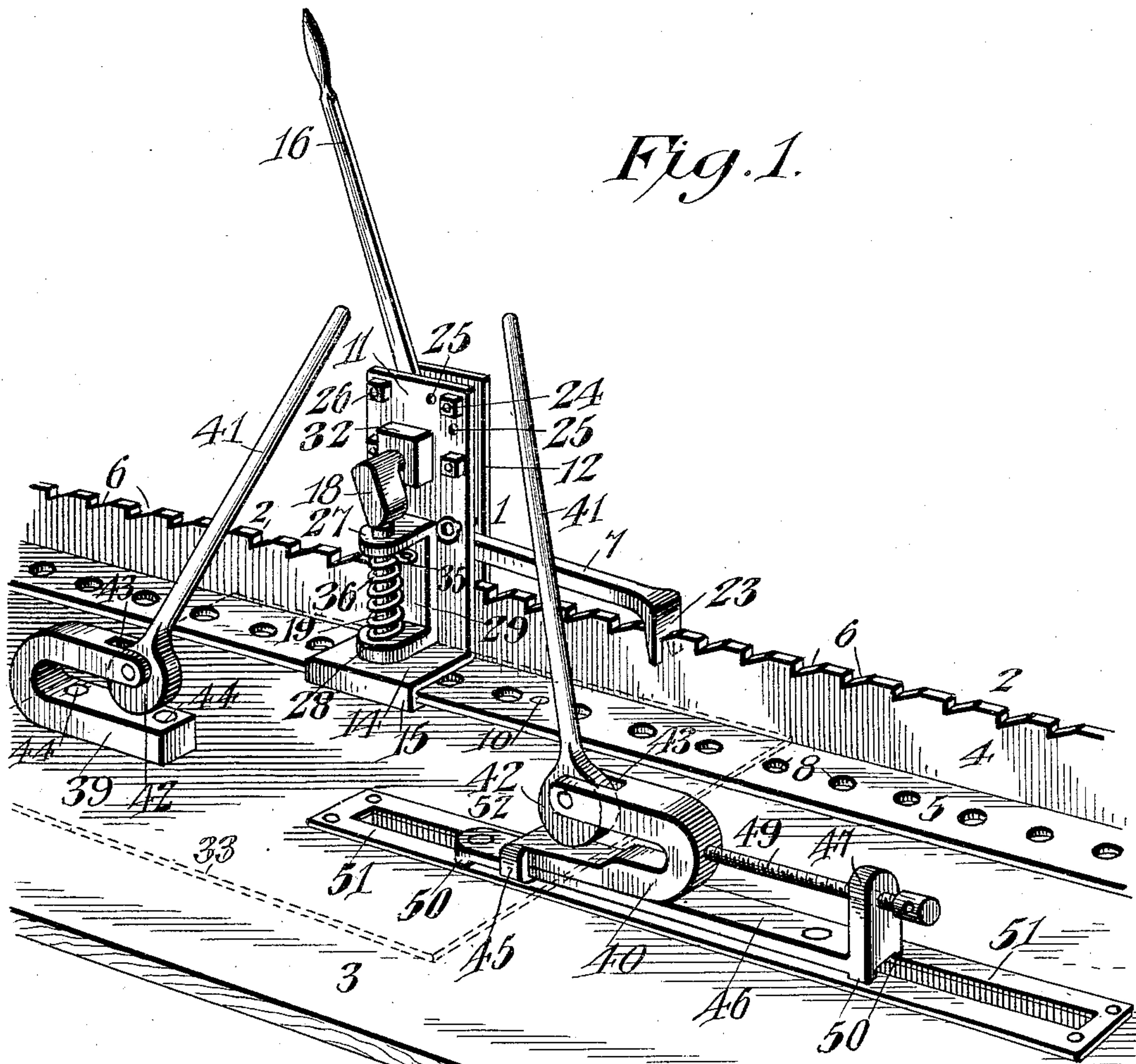


Fig. 1.

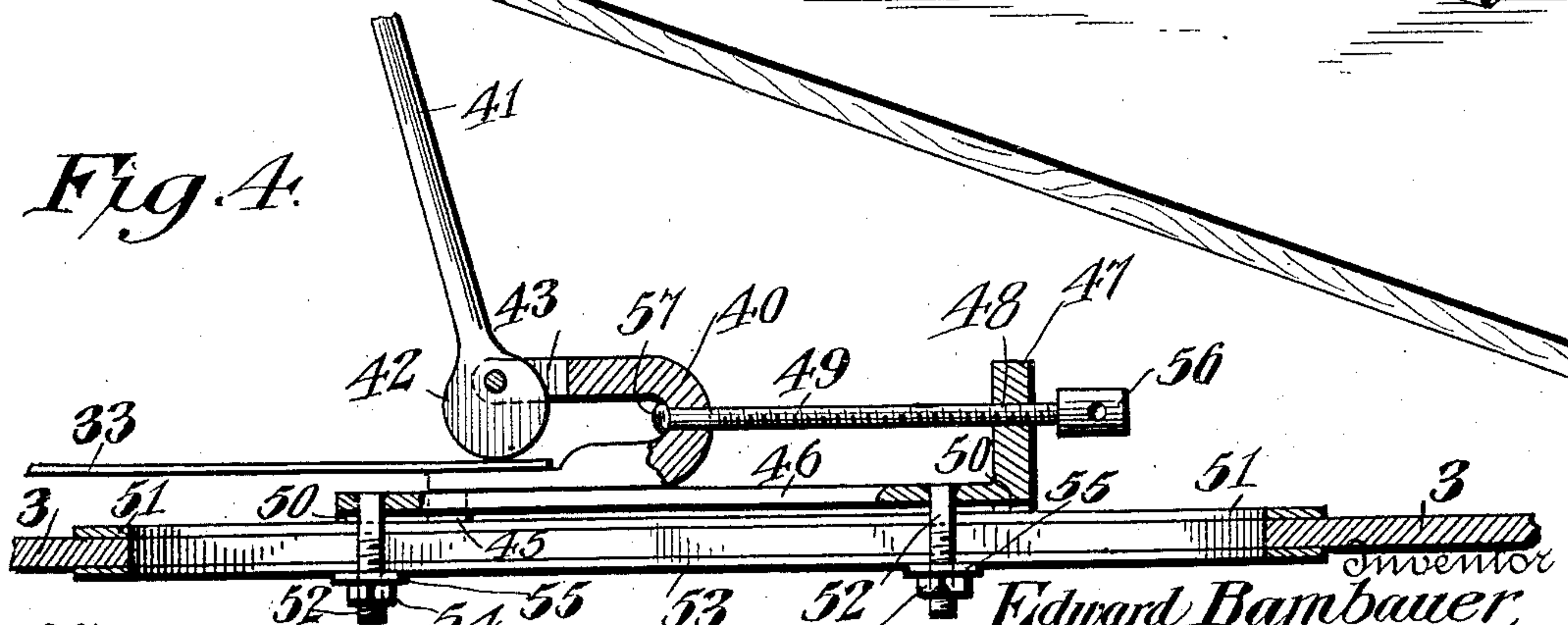


Fig. 4.

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Fig. 2.

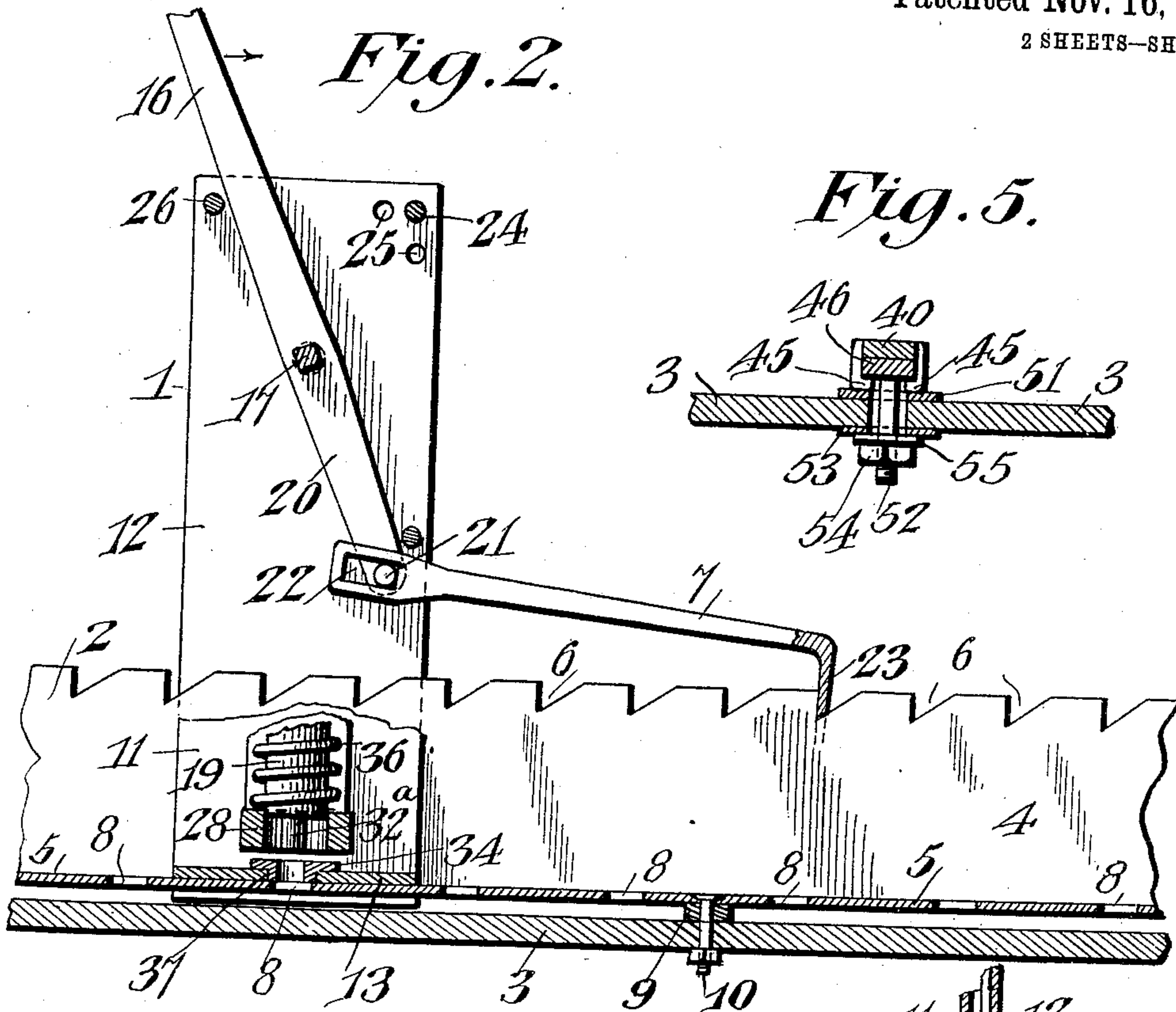


Fig. 5.

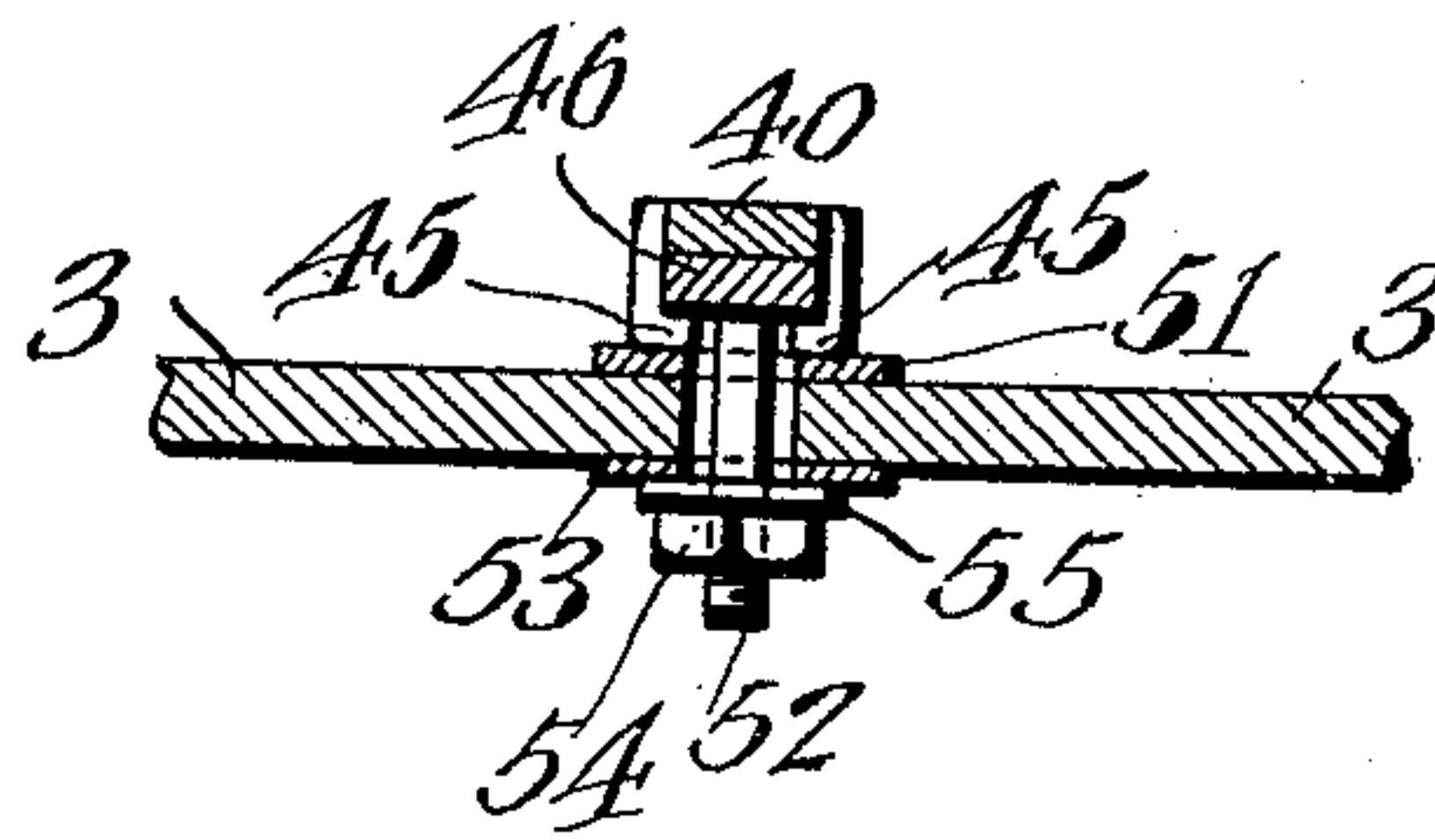
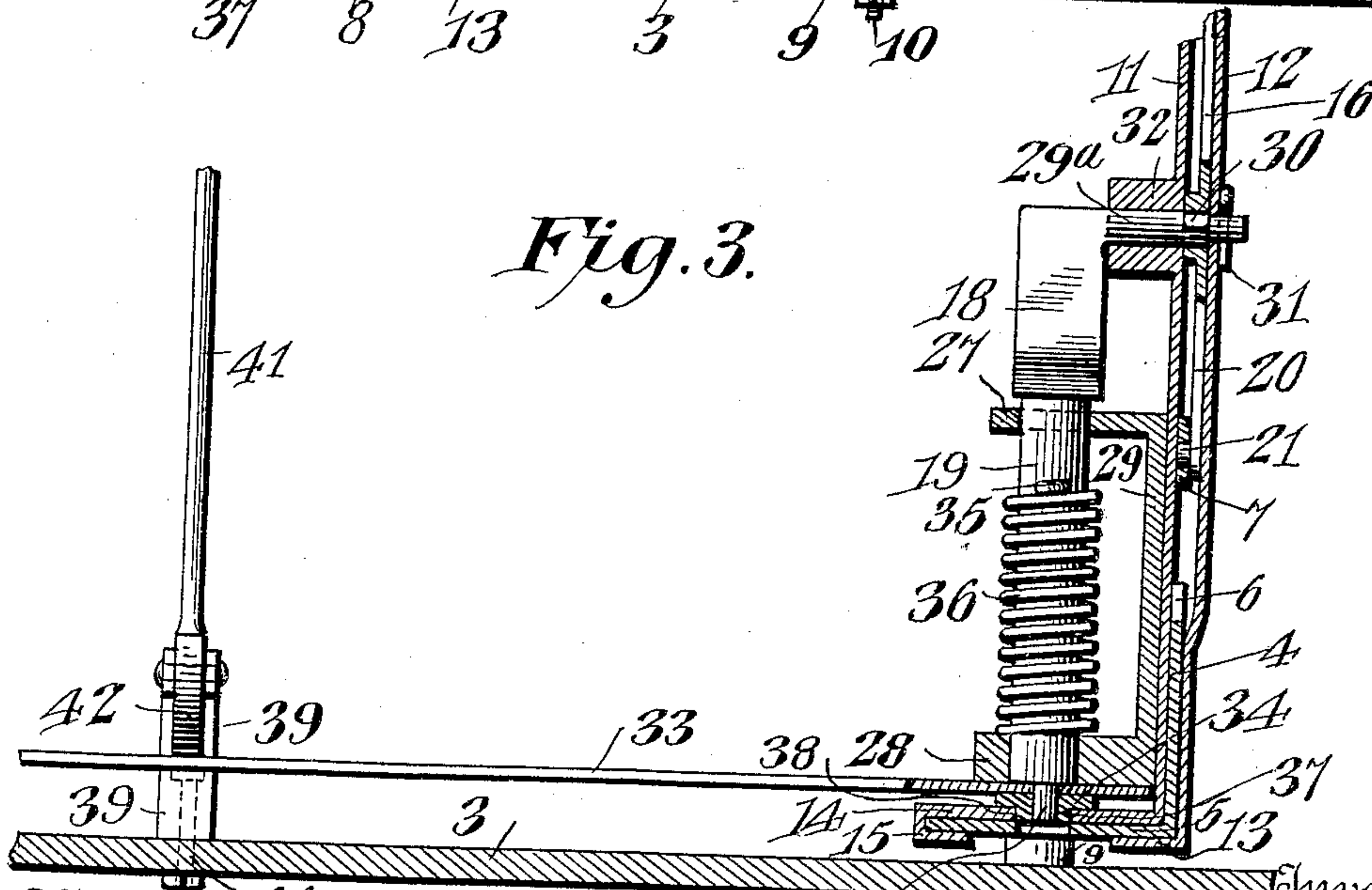


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD BAMBAUER, OF VOLTA, CALIFORNIA.

PUNCHING-MACHINE.

940,575.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed May 26, 1909. Serial No. 498,482.

To all whom it may concern:

Be it known that I, EDWARD BAMBAUER, a citizen of the United States, residing at Volta, in the county of Merced and State of California, have invented a new and useful Punching-Machine, of which the following is a specification.

The invention relates to improvements in punching machines.

10 The object of the present invention is to improve the construction of punching machines, and to provide a simple, inexpensive and efficient machine of this character, capable of rapid operation, and adapted to 15 punch holes of various sizes and at different intervals with absolute accuracy in various kinds of sheet metal, boiler iron and analogous material.

With these and other objects in view, the 20 invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that 25 various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention. 30

In the drawings:—Figure 1 is a perspective view of a punching machine, constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view of the 35 same. Fig. 3 is a transverse sectional view. Fig. 4 is a longitudinal sectional view of the adjustable clamp. Fig. 5 is a detail sectional view, illustrating the manner of slidably connecting the adjustable clamp with 40 the adjustable member.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

45 The punching machine comprises in its construction a slidable frame 1, and a track 2, suitably secured to the top 3 of a bench, or other suitable support, and designed to be of a length to accommodate the work to be operated on. The track, which may be of 50 any length desired, consists of a vertical flange 4 and a horizontal supporting flange 5, the vertical flange being provided in its upper edge at regular intervals with notches 6, forming teeth and having inclined edges 55 and vertical shoulders, adapted to be engaged by a dog 7 of feeding means herein-

after described. The horizontal flange, which forms a support for the slidable frame 1, is provided at intervals with openings 8, which may be any distance apart and 60 which are designed to permit the metal punched from the material to fall through the machine. The horizontal flange may be spaced from the upper face of the top 3 of the bench by washers 9, arranged on the 65 fastening devices 10, which secure the track to the bench.

The slidable frame, which may be constructed of any suitable material, includes front and rear spaced plates 11 and 12, arranged vertically and receiving the vertical 70 flange 4 between their lower portions. The rear plate 12 is provided at its lower end with a forwardly extending horizontal flange 13, which engages beneath the horizontal 75 flange of the track at the back thereof. The front plate 11 is provided at its lower end with a horizontal base 14, arranged upon the horizontal supporting portion of the track and provided at the outer 80 edge thereof with the depending rearwardly extending L-shaped flange 15, engaging beneath the horizontal flange of the track, as clearly illustrated in Fig. 3 of the drawings. By this construction the frame of the punch 85 is slidably interlocked with and is adapted to move along the track.

The slidable frame is actuated by an oscillatory operating lever 16, fulcrumed at an intermediate point in the slidable frame by 90 a pivot 17 of a cam 18, which engages a vertically movable punch 19. The lower arm 20 of the oscillatory lever 16 is provided with a pin or pivot 21, which engages with a longitudinal slot 22 of the dog 7. The slot 22 95 is arranged at the rear end of the dog 7, which is provided at its front or outer end with a depending bifurcated engaging portion or tooth 23, which straddles the upper ends of the vertical flange of the track and 100 successively engages the shoulders formed by the notches 6. When the lever is oscillated forwardly in the direction of the arrow in Fig. 2 of the drawings, the slidable frame is advanced along the track, the distance being 105 regulated by an adjustable pin or key 24 and a plurality of perforations 25, which permit the pin to be arranged different distances from a fixed stop 26 for limiting the backward movement of the operating lever. 110 The backward movement of the handle portion of the operating lever swings its lower

arm 20 forward and advances on the dog 7 along the track.

The punch 19 is mounted in vertically alined guide openings of upper and lower arms 27 and 28 of a bracket 29, and the cam 18, which is preferably provided with an integral pivot 29^a, engages the upper end of the punch and thrusts the latter downward when the operating lever is swung backward. The pivot 29^a has a squared portion 30, which engages a rectangular opening of the operating lever, and the rear end of the pivot receives a key 31, or other suitable fastening device for retaining it in the bearings of the slidable frame. The pivot is rounded in advance and in rear of the squared portion 30, and the front plate is preferably provided with an enlarged bearing portion 32. The punch is provided at its lower end with a reduced portion 32^a, which pierces the sheet metal 33, or other work placed in the machine. The forwardly extending base of the frame is equipped with a die 34, having an opening to receive the lower reduced engaging portion of the punch. The punch is removable from the bearing bracket, being detachably retained in place by a split key 35, or other suitable fastening device, located at the upper portion of the punch and arranged to engage the lower face of the upper arm 27 and engaged by a coiled spring 36, disposed on the punch and interposed between the fastening device 35 and the lower arm 28 of the bracket. The die 34 is provided with a reduced portion 37, which is detachably fitted in an opening 38 of the base of the slidable frame and the upper portion of the die extends beyond the opening 38 and rests upon the base 14. The punch may be detached by simply removing the key 35, and the slidable frame may be easily slipped off the track for greater ease in changing the die. When the handle portion of the operating lever is thrown forward, the pin or pivot moves the distance of the slot 22 before actuating the slidable frame, this independent movement of the operating lever being sufficient to carry the cam from the upper end of the punch to permit the latter to clear the work before the machine is advanced along the same.

The punching machine is adapted to operate on sheet metal of any width or length within its capacity, and it is equipped with stationary and adjustable clamps 39 and 40, arranged to engage a piece of sheet metal at opposite sides or ends thereof, and the adjustable one being movable outwardly by means hereinafter described to enable any kinks in the sheet metal to be readily taken out of the same, so that the holes will be punched with absolute accuracy. Also any creases or bends in the sheet metal will not interfere with the rapid and free operation of the punching machine. Each of the

clamps comprises a substantially U-shaped body portion, arranged horizontally and having its upper side bifurcated for the reception of a cam lever 41, provided at its lower end with a cam head 42. The cam head 42 is pivoted in the bifurcation 43 and is adapted to clamp the sheet metal firmly against the lower side of the U-shaped body portion. The U-shaped body portion of the stationary clamp is equipped with threaded shanks 44, which pierce the bench and are secured to the same by nuts. The adjustable clamp is provided at the lower side of its U-shaped portion with depending approximately L-shaped lugs 45, slidably embracing an adjustable member 46, which is provided at its outer end with an upwardly extending arm 47, having a threaded perforation 48 for an adjusting screw 49. The adjustable member 46 is provided at its ends with lugs or feet 50, which rest upon a metallic face plate 51 and supports the adjustable member in spaced relation with the bench to enable the adjustable clamp to slide freely on it. The bench is slotted to receive threaded stems 52 of the adjustable member, and the face plate 51 is provided with a corresponding slot and extends around the slot of the bench, which is also preferably provided at the lower face of its top with a metal plate 53. The threaded stems 52 are provided with nuts 54 for securing the member 46 in its adjustment, washers 55 being preferably interposed between the nuts and the lower face plate 53. The adjustable member, however, may be slidably mounted in any other preferred manner. The screw 49 is provided at its outer end with a suitable operating head 56, and its inner end 57 is swiveled to the U-shaped body portion of the adjustable clamp at the connecting portion or bend thereof. The work to be operated on by the punching machine is gripped by the two clamps, and should there be any kinks or bends in the metal, the screw 49 is operated to straighten the sheet metal. The head 56 is preferably provided with openings adapted to receive a bar or lever for enabling the necessary strength to be exerted on the sheet metal for straightening the same. When the work is secured to the bench by the clamps in position to be operated on by the punching machine and the latter is set to punch the material at the desired intervals, the operating lever may be rapidly oscillated to operate the punch and feed the machine.

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

1. A punching machine including a fixed track, a frame slidable along the same, a punch carried by the frame, an operating lever, means actuated by the operating lever for feeding the frame along the track dur-

ing one movement of the lever, and means actuated by the lever for operating the punch during the movement of the said lever in the opposite direction.

5 2. A punching machine including a track, a slidable frame mounted on the track, a punch carried by the slidable frame, an operating lever, a dog pivotally connected to the operating lever and engaging the
10 track and arranged to advance the frame along the track during the movement of the lever in one direction, and means actuated by the lever for actuating the punch when the said lever is moved in the opposite direc-
15 tion.

3. A punching machine including a track, a slidable frame mounted on the track, a punch carried by the slidable frame, an operating lever, a dog pivotally connected to the
20 operating lever and engaging the track and arranged to advance the frame along the track during the movement of the lever in one direction, and a cam connected with the lever and arranged to operate the punch
25 when the lever is moved in the opposite direction.

4. A punching machine comprising a track provided with teeth, a frame slidable along the track, an oscillatory operating lever, a dog pivoted to the lever and having a tooth
30 for engaging the teeth of the track, a punch carried by the frame, and a cam connected with the lever and arranged to engage the punch.

35 5. A punching machine comprising a track provided with teeth, a frame slidable along the track, an oscillatory operating lever, a dog pivoted to the lever and having a tooth for engaging the teeth of the track,
40 a punch carried by the frame, a cam connected with the lever and arranged to engage the punch, and means for limiting the oscillatory movement of the lever for controlling the teeth of the frame.

45 6. A punching machine including a fixed track, a frame slidable along the track, a punch carried by the frame, a lever pivoted to the frame, a cam connected with the pivot of the lever and arranged to engage the
50 punch, and a dog connected with the lever and engaging the track for feeding the frame along the same.

7. A punching machine including a fixed track, a frame slidable along the track, a
55 punch carried by the frame, an oscillatory lever pivoted at an intermediate point in the frame and having upper and lower arms, a punch carried by the frame, a dog pivoted to the lower arm of the lever and engaging
60 the frame, and a cam connected with the pivot of the lever and arranged to operate the punch.

8. A punching machine including a track, a frame slidable along the track, an oscilla-
65 tory lever pivoted to the frame, a dog engag-

ing the track and connected with the lever, a punch carried by the frame, and a cam connected with the lever and arranged to engage the punch, said lever having a limited movement independent of the dog to permit
70 the cam to release the punch before the frame is moved along the track by the dog.

9. A punching machine comprising a track consisting of a vertical flange provided at its upper edge with teeth, and a horizontal
75 supporting flange, a frame including spaced plates receiving the vertical flange of the track and provided with means for slidably engaging the horizontal flange, a punch carried by the frame, an oscillatory lever piv-
80 oted between the members of the frame, a dog connected with the lever and engaging the teeth of the track, and a cam connected with the pivot of the lever for operating the punch.

10. A punching machine comprising a track composed of vertical and horizontal flanges, a slidable frame including spaced members receiving the vertical flange of the track, one of the members being provided
85 with a base arranged upon the horizontal flange of the track, and each of the said members being provided with means for slidably engaging the track.

11. A punching machine including a track
95 composed of vertical and horizontal flanges, the horizontal flange being provided at intervals with openings, a frame slidable along the track and having a base arranged upon the horizontal flange and provided with an
100 opening, a die removably fitted in the opening of the base, a punch carried by the frame and cooperating with the die, an operating lever, feeding mechanism actuated by the operating lever and engaging the vertical
105 flange of the track, and means also actuated by the lever for operating the punch.

12. A punching machine including a track composed of vertical and horizontal flanges, the vertical flange being provided with teeth
110 and the horizontal flange being spaced from the supporting surface and having openings arranged at intervals, a frame slidably mounted on the track and provided with means for engaging beneath the bottom
115 flange of the same, a punch carried by the frame, a lever pivoted to the frame, a cam connected with the pivot of the lever and arranged to engage the punch, and a dog pivoted to the lever and engaging the teeth
120 of the vertical flange.

13. A punching machine including a track, a frame movable along the track and provided with a punch, means for feeding the frame along the track and for operating the
125 punch, stationary and movable clamps for holding the work, and means for adjusting the movable clamp to remove the kinks and bends from the material.

14. A punching machine including a track, 130

a frame movable along the track and provided with a punch, means for feeding the frame along the track and for operating the punch, stationary and movable clamps for
5 holding the work, an adjustable member receiving the movable clamp, and a screw mounted on the adjustable member and connected with the movable clamp for stretching the material.

10 15. A punching machine including a track, a frame movable along the track, punching mechanism carried by the frame, fixed and movable clamps, the movable clamp being provided with depending lugs, an adjustable
15 member supporting the movable clamp and embraced by the lugs thereof, and means carried by the adjustable member and connected with the movable clamp for moving the same outward to stretch the material.

20 16. A punching machine including a track, a frame movable along the track, punching mechanism carried by the frame, fixed and movable clamps, the movable clamp being provided with depending lugs, an adjustable

member provided with depending lugs and
25 receiving the adjustable clamp and slidably embraced by the lugs thereof, said member being also provided with an upwardly extending arm, and a screw mounted on the
30 arm and connected with the movable member for drawing the same outward to stretch the material.

17. A punching machine comprising a track, a frame slidable along the track, punching mechanism carried by the frame,
35 fixed and movable clamps, each including an approximately U-shaped body portion, and a cam lever, an adjustable member supporting the movable clamp, and means for
40 adjusting the movable clamp along the said member.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD BAMBAUER.

Witnesses:

W. T. CHEATHAM,
FULTON POLLOCK.