

J. RANZ.

WORK HOLDER OR CLAMP.

(Application filed Nov. 13, 1899.)

(No Model.)

Fig. 1.

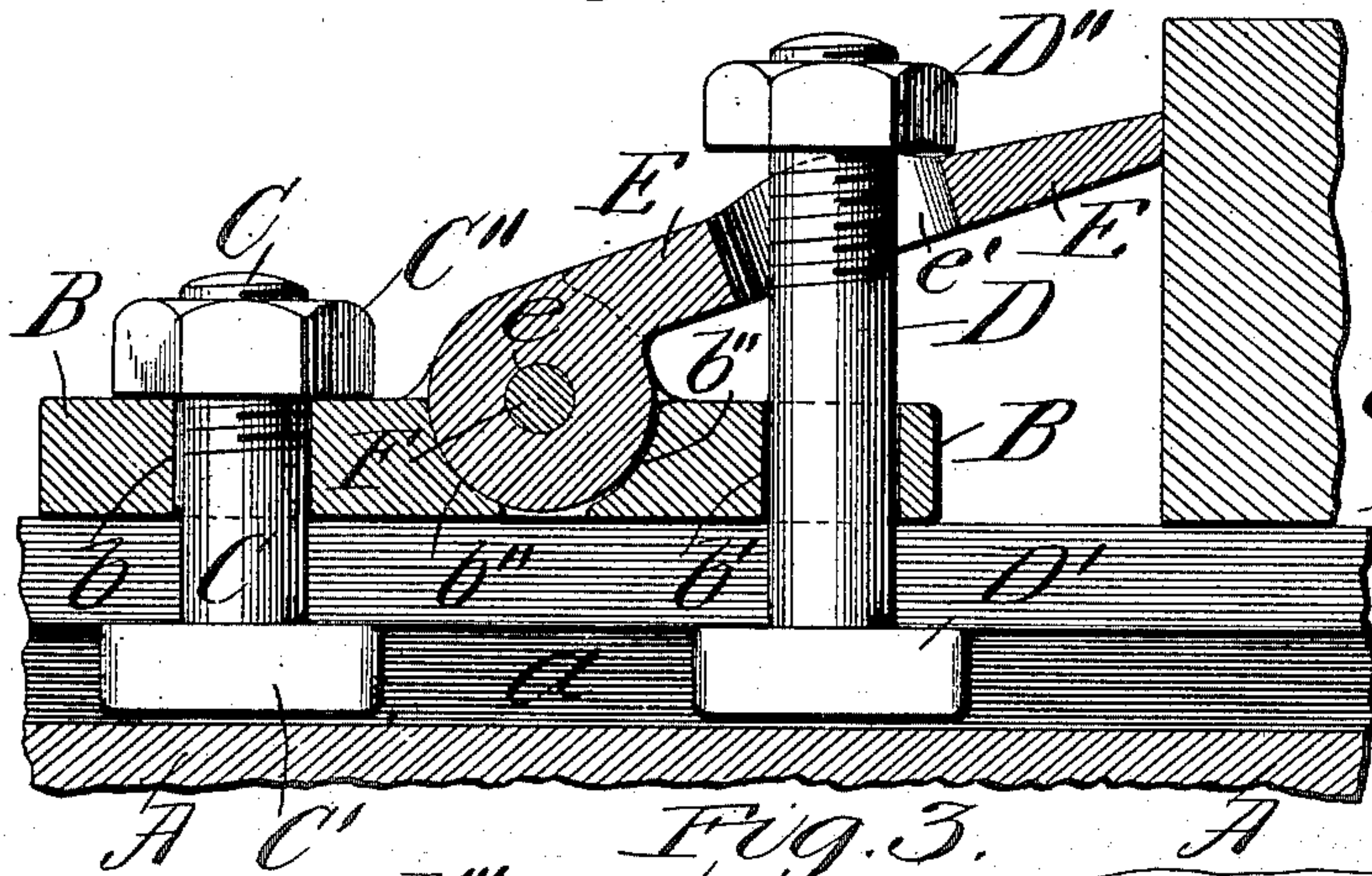


Fig. 2.

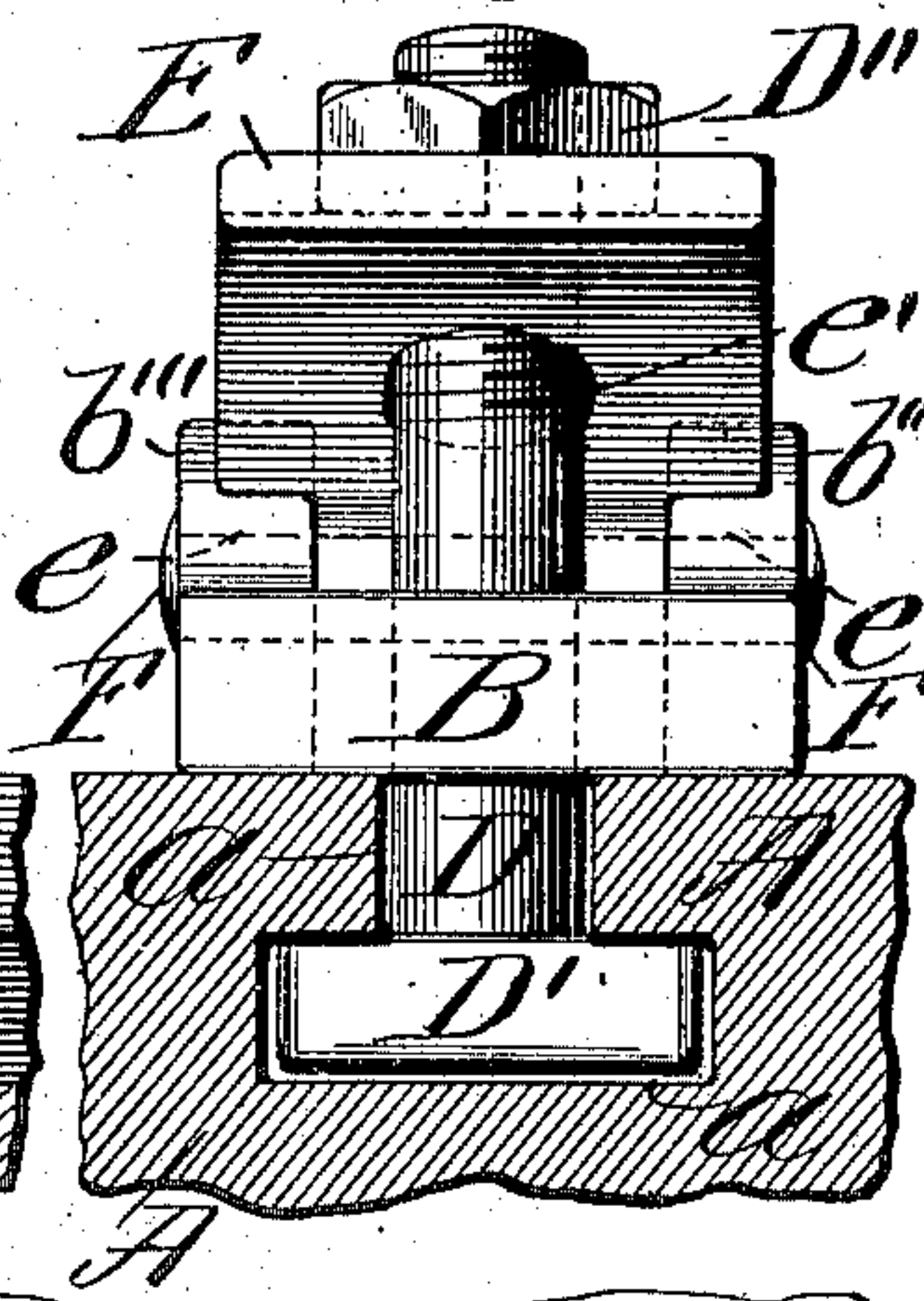


Fig. 3.

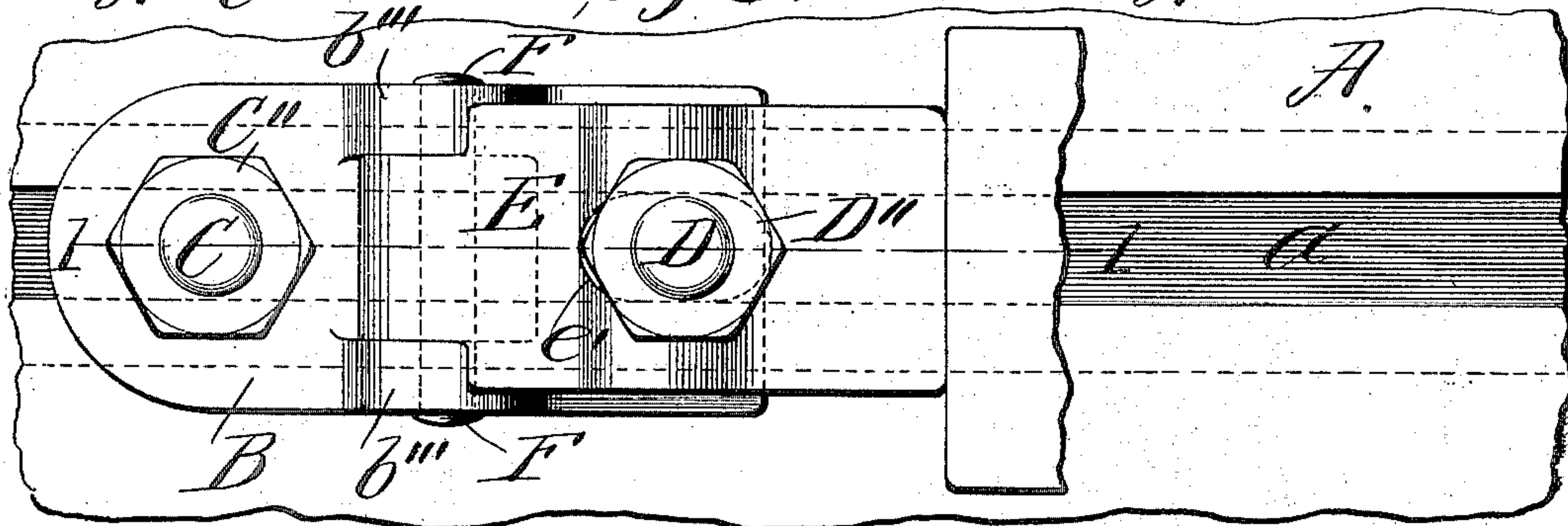


Fig. 4.

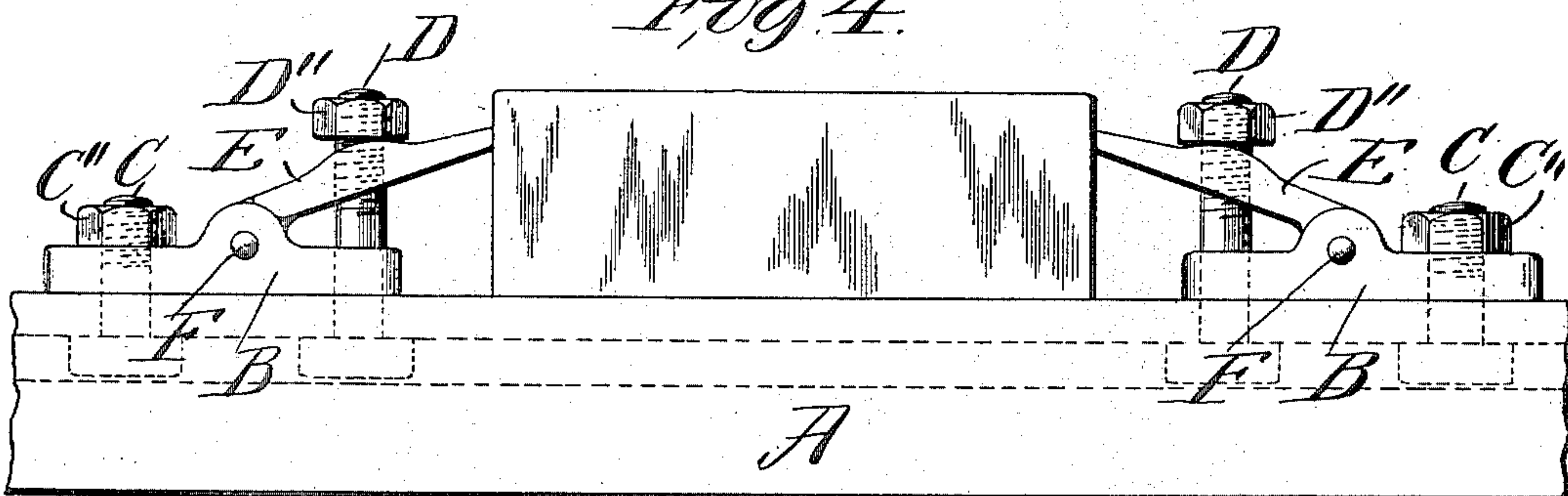
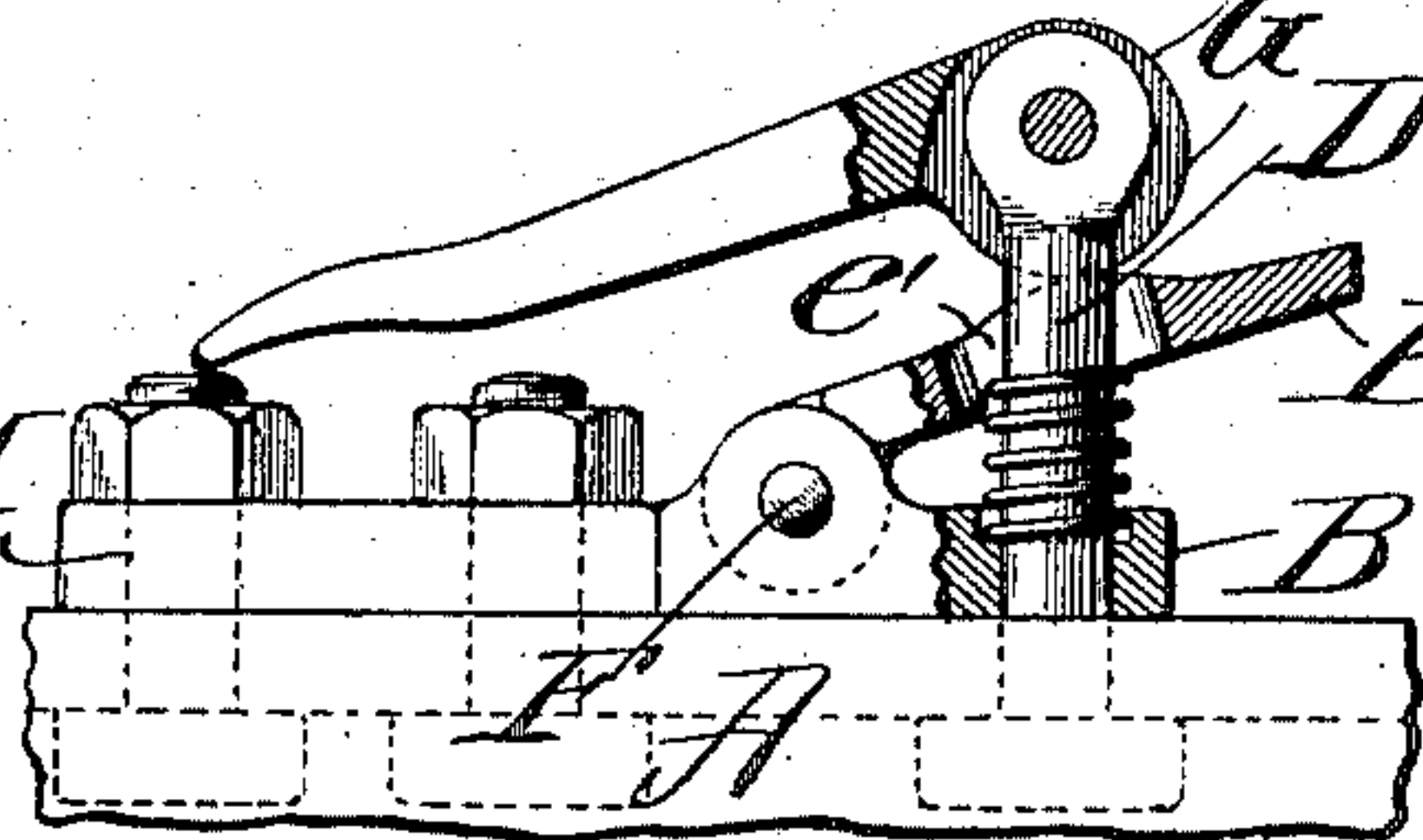


Fig. 5.



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# UNITED STATES PATENT OFFICE.

JACOB RANZ, OF ST. LOUIS, MISSOURI.

## WORK HOLDER OR CLAMP.

SPECIFICATION forming part of Letters Patent No. 661,322, dated November 6, 1900.

Application filed November 13, 1899. Serial No. 736,789. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB RANZ, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Work Holders or Clamps, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful improvement in a work holder or clamp to be used particularly in clamping material to be worked upon metal-working machines, although it is obvious that it can be used equally as well in woodworking or other machines.

One object of this invention is to provide a simple, practical, and inexpensive clamp or dog to be used upon planer-beds, milling-machines, drill-presses, and the like, wherein suitable inverted-T grooves are arranged and with which my said improved clamp or dog coöperates.

Another object of this invention is to so construct the same that the "work" can be clamped between two of these clamps in such manner that the entire upper surface of said work will be presented to the cutting-tool of the machine, the same being accomplished by causing that portion of the clamp which contacts with the work to impinge against the sides thereof.

With these objects in view this invention consists in the novel arrangement, construction, and combination of the several parts, all as will hereinafter be described, and afterward pointed out in the claims.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view on the line 1 1 of Fig. 3 of my improved clamp or dog, illustrating the same in a clamped position upon the bed of a planer or other machine. Fig. 2 is an end view of the same, a portion of the planer-bed or other machine being shown in section. Fig. 3 is a plan view of the same. Fig. 4 is a side elevational view, on a reduced scale, of a portion of a planer-bed or other machine, illustrating

thereon a piece of material to be worked, the same being clamped in proper position by two of my improved clamps or dogs; and Fig. 5 is a side elevational view, partly in section, of a portion of a planer-bed or other machine, illustrating in clamped position thereon a slightly-modified form of my improved clamp.

Similar characters refer to similar parts throughout the several views.

In the drawings, A represents a portion of the bed of a machine which is designed to receive and have clamped thereto any material to be planed, milled, or otherwise worked upon, said bed being provided, as is usual, with inverted-T-shaped grooves *a*.

B represents the base-block of my improved clamp or dog, which is preferably provided with two perforations *b b'*, through which clamping-bolts C and D, respectively, pass, said clamping-bolts being provided upon the lower ends with rectangular heads C' and D', respectively, which heads are designed when the clamp as an entirety is properly arranged on the bed of the machine to hold the work to fit in the horizontal member of the inverted-T-shaped groove *a*.

C'' and D'' represent nuts arranged on the upper or screw-threaded ends of the bolts C and D, respectively, and are designed to perform functions hereinafter described.

*b''* represents an approximately semicylindrical recess formed in the upper face of and about centrally located in the block B, and at the ends of said semicircular recess and rising from said block are lugs *b'''*, which are provided with perforations axially in line with each other.

E represents a pivoted dog or lever whose inner end is somewhat enlarged and practically cylindrical in shape and is designed to snugly fit the semicylindrical recess *b''* and pass between the perforated lugs *b'''*, in which position a perforation *e*, formed in said dog or lever, is in proper alinement with the perforations in the lugs *b'''*. These perforations formed in the lugs *b'''* and the inner end of the dog or lever E are designed to receive a short bar or shaft F, which is preferably secured against lateral movement by riveting or battering its ends, after which the dog or lever E is free to move or swing on said shaft



F, as is obvious. This dog or lever E has formed in it a slot or opening  $e'$ , and when the parts of the clamp as an entirety are assembled the bolt D is designed to pass through  
 5 said slot, and the upper threaded end of said bolt D is fitted with the nut D'', before mentioned. The bolt D is of sufficient length to enable the dog or lever E when the nut D'' is at its extreme end to have considerable  
 10 vertical movement—say twenty degrees, more or less.

In order that the nut D'' may have a more even bearing face on the dog or lever E, I crown or form convex that portion of said dog  
 15 or lever which coöperates with the nut D'', as is clearly illustrated in Fig. 1 of the drawings.

The method of using my improved work holder or clamp is as follows: When it is de-  
 20 sired to use my improved work holder or clamp for holding a piece of work in place upon a planer or other suitable machine, the device is so placed at the edge of the bed that the shanks of the bolts C and D will slide  
 25 through the vertical member of the inverted-T-shaped groove  $a$ , while the rectangular heads of said bolts will slide into the horizontal member of said T-groove. The device is then slid along the bed to a proper position,  
 30 where it is then clamped to the bed by tightening the nut on the bolt C. Another one of my improved work holders or clamps, which is precisely the same as the one just mentioned, is introduced in like manner into a  
 35 T-groove on the opposite side of the work, the free ends of the dogs or levers E facing each other. The material to be worked is now placed upon the bed of the machine between the two holders, and the dogs or levers  
 40 E, having been previously lifted to a desired angle—such, for instance, as that illustrated in Figs. 1 and 4—are caused to rest upon the edges of the material, after which the holders are clamped to the bed of the machine by  
 45 tightening the nuts on the bolts C. The nuts on the bolts D are now tightened, which operation performs a double function—first, in assisting the bolts C to clamp the work-holders to the bed of the machine, and, second,  
 50 in firmly clamping the material to be worked to the bed of the machine. This latter is accomplished by reason of the fact that the dogs, having been elevated previous to the body of the clamp being secured in position, will  
 55 when the nuts on the bolts D are turned down move in an arc of a circle toward each other and in such action contact with the side face of the work which intersects the arc described by the free end of the dogs. This action is  
 60 somewhat on the order of a toggle-joint in that the leverage exerted through the engagement of the free end of the dogs on the work is directed inwardly and downwardly. The nuts on the backs of the devices prevent them  
 65 from being kicked back when the dogs are exerting their pressure on the work, and, fur-

ther, as the ends of the dogs are clamped in position the body portions of the devices will be held more firmly to the bed of the machine. It will of course be obvious that in a single  
 70 device more than one bolt can be employed to force the dog down to engagement with the work to be operated upon and more than one bolt can be employed to secure the body portion of the device to the bed of the machine,  
 75 a plurality of bolts so employed being previously arranged in tandem, so as to coöperate in the same slot in the bed. This means of clamping the material to be worked to the bed of the machine is most effective and powerful,  
 80 as the great leverage exerted upon the pivoted dog or lever by the nut D'' will securely hold the material to be worked in place. It will also be observed that by arranging the dog or lever E at an angle relative to the bed  
 85 with its free end contacting with the material to be worked and causing said lever to move in an arc of a circle when forced downwardly by its coöperating nut D'' the work is not only firmly held against lateral and longitudinal  
 90 movement, but against vertical movement. Another advantageous feature in connection with the above is that the bar or shaft F, upon which the dog or lever E swings, is not  
 95 subjected to the enormous strain or back pressure of said dog or lever E for the reason that, as before stated, the inner cylindrical portion of the dog E snugly fits into the semi-cylindrical recess  $b''$  of the base-block B and one portion of this recess receives the strain.  
 100

In Fig. 5 I have illustrated a slightly-modified form of clamping means for coöperation with the pivoted dog or lever E, wherein I have made use of a cam or eccentric G, provided with a suitable operating-lever, said  
 105 cam or eccentric being pivotally connected to the upper end of the bolt D, as will be clearly understood. In this figure of the drawings I have also shown an expansible coiled spring arranged around the bolt D and interposed  
 110 between the upper face of the block A and the lower face of dog or lever E, the object of which is to obviate the necessity of having to manually raise the dog or lever when the device is ready to be used. It will also be  
 115 observed from a glance at this figure that, if desirable, the bolt C and its nut may be dispensed with and that portion of the base-block which carried said bolt can be omitted, in which event the bolt D alone is relied upon  
 120 to clamp said base-block and its carried parts to its support. It might also be desirable when using a work-holder of the construction just described to make use of a block H, provided with one or more clamping-bolts,  
 125 said block H being clamped in such position adjacent to the work-holder as to assist the bolt D in holding the same against longitudinal movement.

I am aware that minor changes in the arrangement, construction, and combination of  
 130 several parts of my device can be made and



substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In a clamping device, the combination with an adjustable body portion, of means for locking the same in position, a dog mounted on said body portion, and means independent of said locking device for the body portion for adjusting the position of said dog relative to said body portion, said means also serving to clamp the dog and body portion in position; substantially as described.

2. In a clamping device, the combination with a body portion, of means for locking the same in position, a dog pivoted thereon, and means coöperating with the support for the body portion and the dog, for moving said dog to, and locking the same in, an operative position, said means also serving to clamp the body portion in position on its support; substantially as described.

3. In a clamping device, the combination with a recessed body portion, of a dog formed with an eye fitting in said recess which affords an abutment therefor, means for fastening the body portion in position, and an independently-operable device for exerting pressure on the dog to move the same in an arc of a circle, said independently-operable device also holding the body portion in position; substantially as described.

4. In a clamping device, the combination with a body portion, of means for fastening the same in position, a pivoted dog mounted on said body portion, said dog being provided with a slot, and a crown-face on each side of said slot, and a bolt which passes through said body portion through the slot and dog, clamping the device in position and forcing the dog into engagement with the material to be operated upon; substantially as described.

5. The combination with a grooved machine-bed, of a clamping device arranged thereon and comprising the body portion, a plurality of bolts whose heads fit and slide in said grooves, nuts for clamping said body portion in position on the bed, a dog pivoted to said body portion, and a nut on one of said securing-bolts for coöperation with the upper face of said dog; substantially as described.

6. In combination with a machine-bed having formed therein inverted - T - shaped grooves, of a base-block, a pivoted dog or lever mounted thereon, means for clamping the base-block and its carried parts to the machine-bed, and independent means for clamping the dog or lever to the material to be "worked," said last-mentioned means also clamping the base-block and its carried parts to the machine-bed; substantially as described.

7. In a work-holder of the character described, the combination with a base-block, of a pivoted dog or lever mounted thereon, said dog or lever being provided with a slot, a bolt which passes through a suitable perforation in the base-plate and the slot in the pivoted dog or lever, means arranged on said bolt for coöperation with the pivoted dog or lever to move it in the proper direction to cause it to impinge against the material to be held, and at the same time, provide means whereby the work-holder as an entirety is, when said work-holder is in proper position upon a bed of a machine, clamped to the bed of a machine, and additional means arranged on said work-holder for clamping the same upon the bed of a machine; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 11th day of November, 1899.

JACOB RANZ.

Witnesses:

WM. H. SCOTT,  
A. S. GRAY.