

No. 651,060.

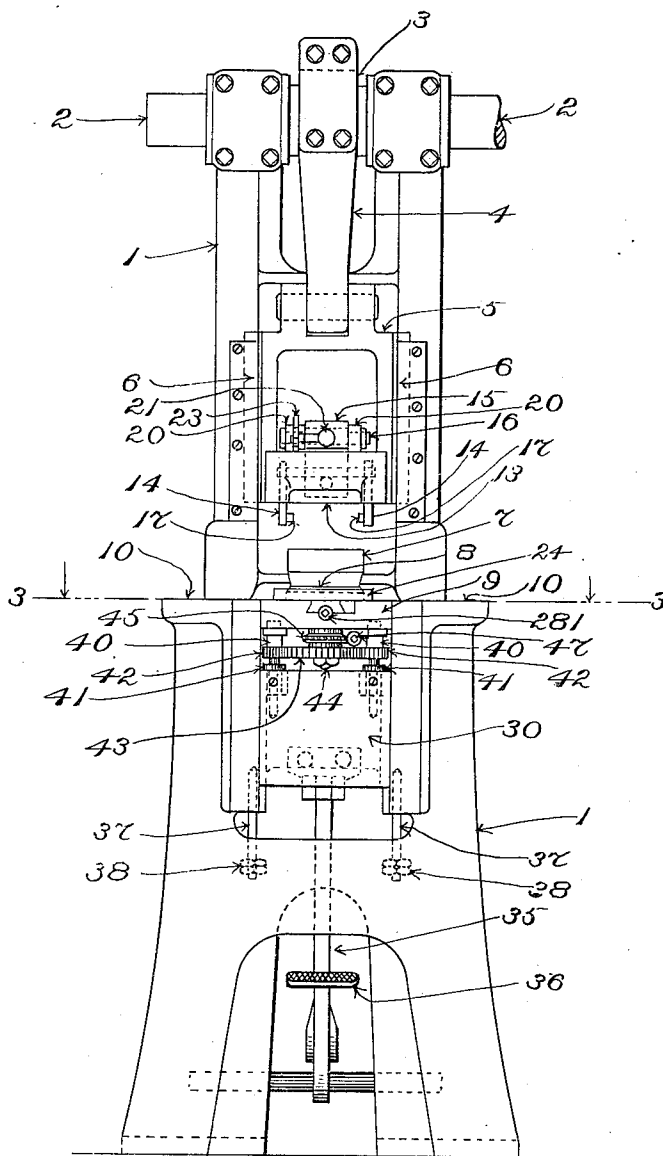
Patented June 5, 1900.

J. B. TOUGAS.
POWER PRESS.

(Application filed Mar. 28, 1899.)

(No Model.)

6 Sheets--Sheet 1.



Witnesses:

Fig. 1.

Inventor:

Oscar F. Hill

John B. Tougas

Edith J. Anderson.

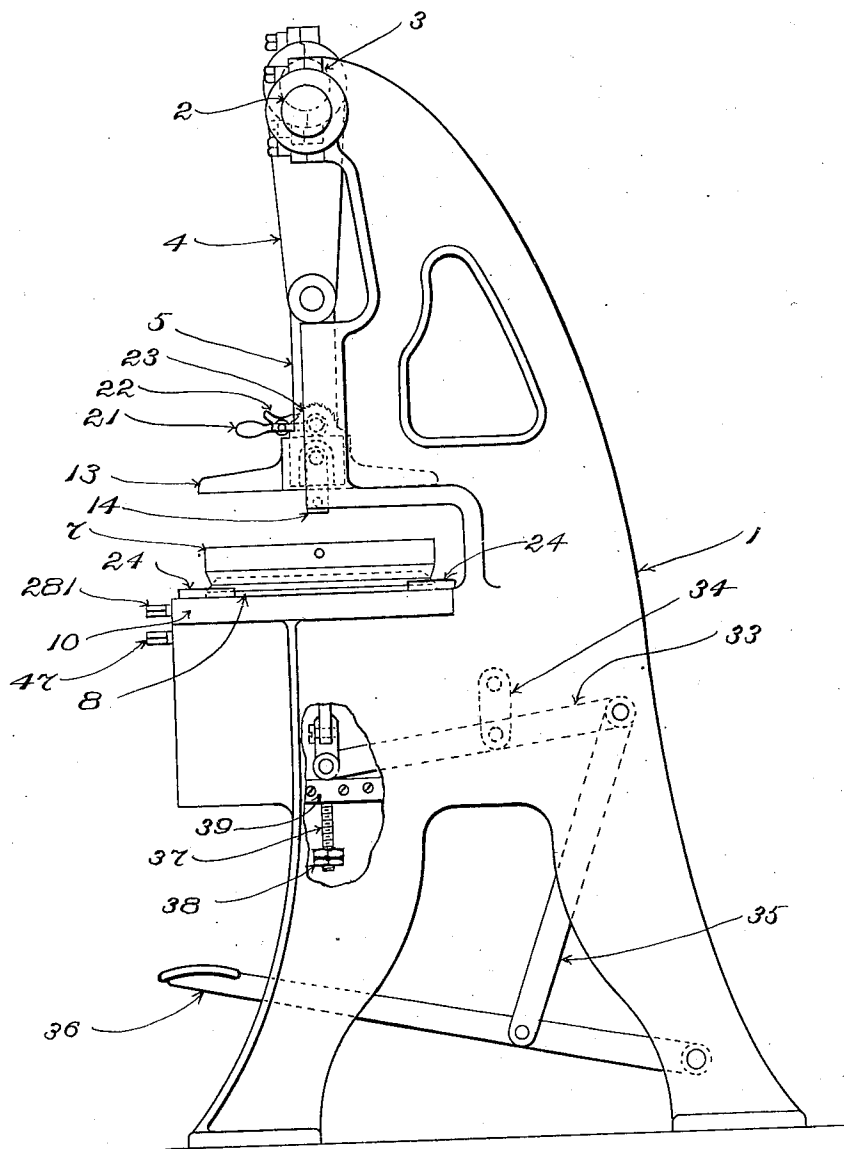
by Maceo Balver Randall

his Attorneys:

(No Model.)

(Application filed Mar. 28, 1899.)

6 Sheets—Sheet 2.



Oscar F. Bill
Edith J. Anderson.

Fig. 2.

Inventor:

John B. Tongas

By Macleod Calver & Randall

his Attorneys.

No. 651,060.

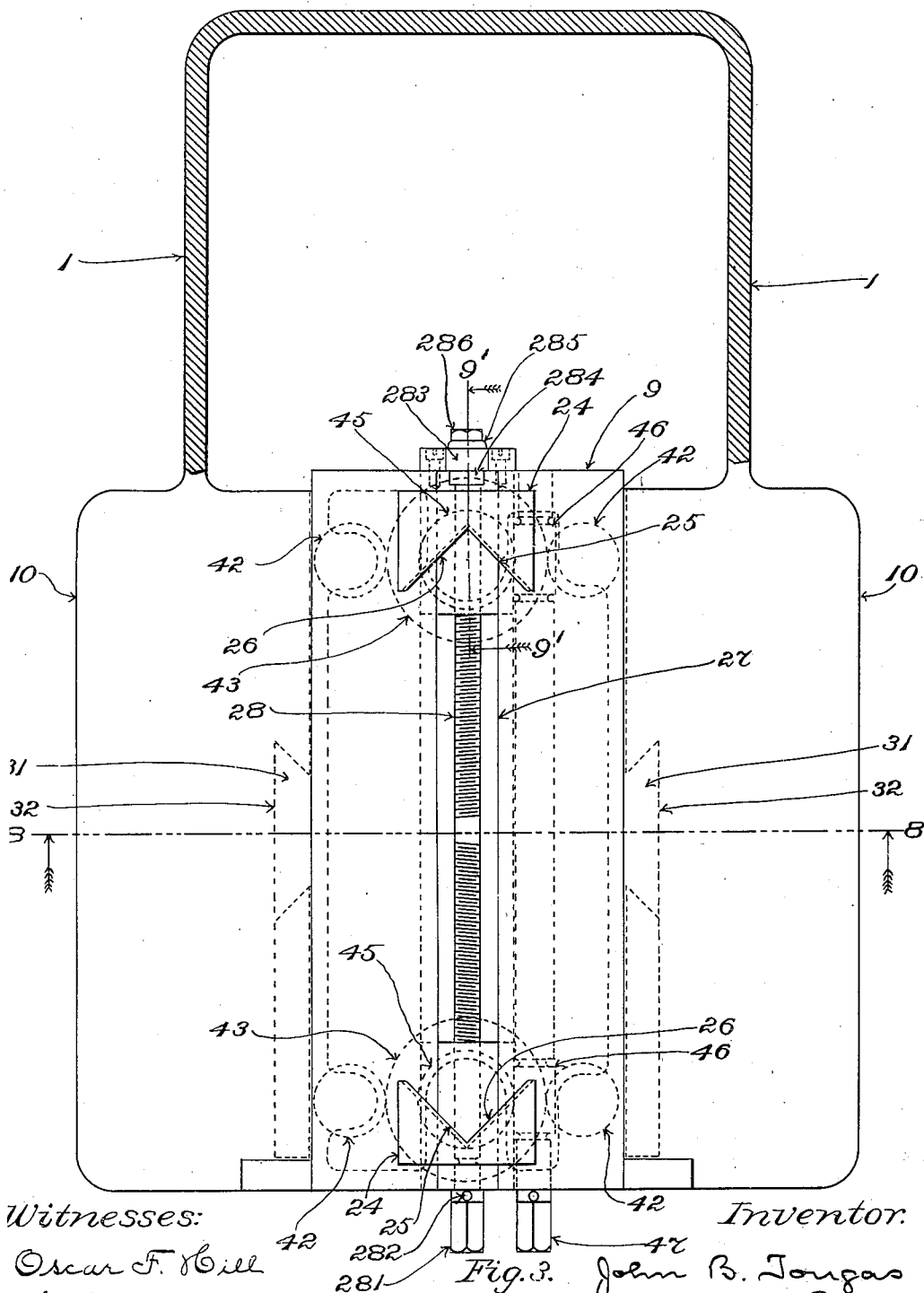
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(Application filed Mar. 28, 1899.)

(No Model.)

6 Sheets—Sheet 3.



Witnesses:

Oscar F. Bell

Edith J. Anderson.

Inventor:

John B. Tougas

By Maceo Balver & Randall
his Attorneys.

No. 651,060.

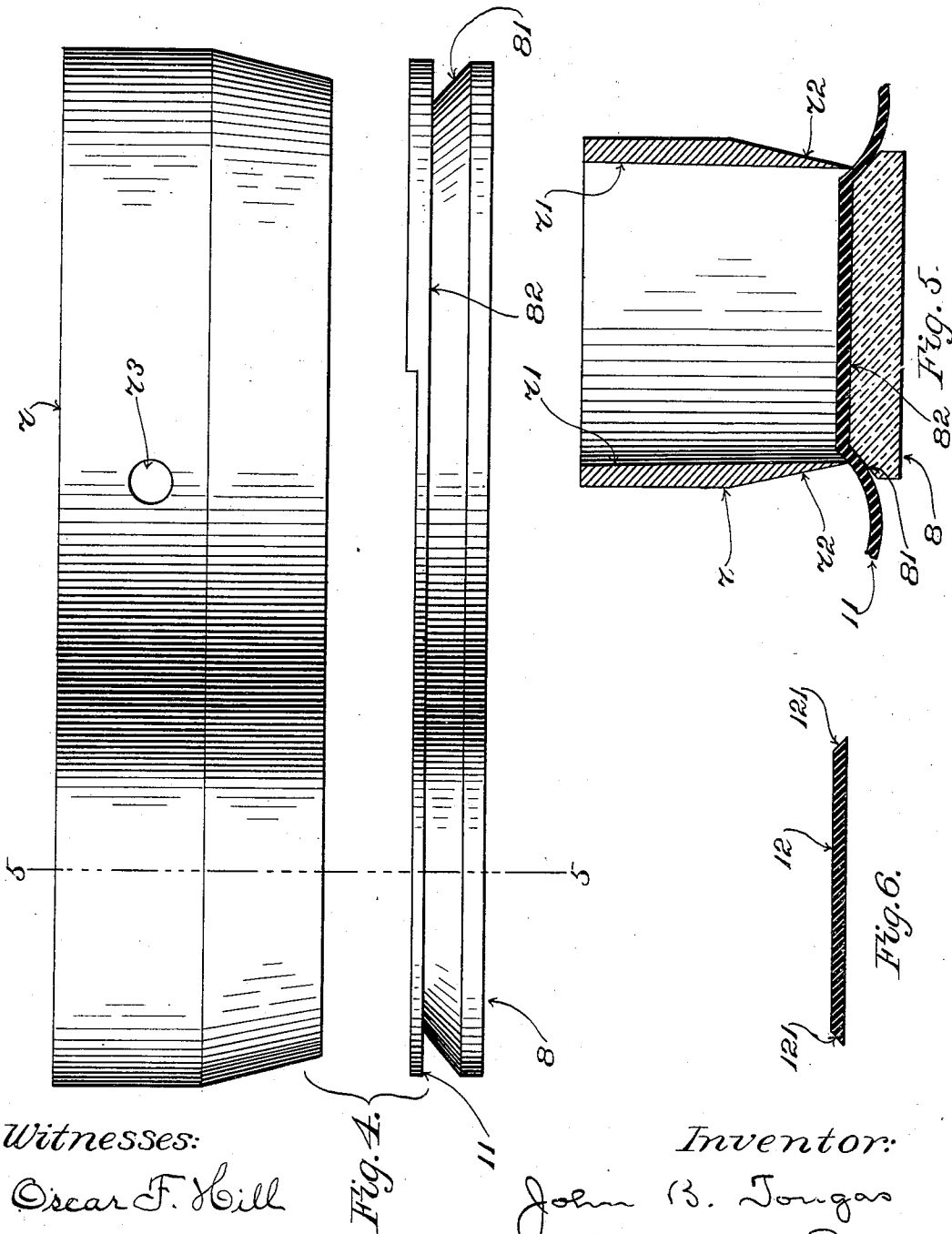
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(No Model.)

6 Sheets—Sheet 4.



Witnesses:

Oscar F. Hill

Lepine & Hall Rice

Fig. 4.

Inventor:

John B. Tougas
by Maceo Calver & Randall

his Attorneys

No. 651,060.

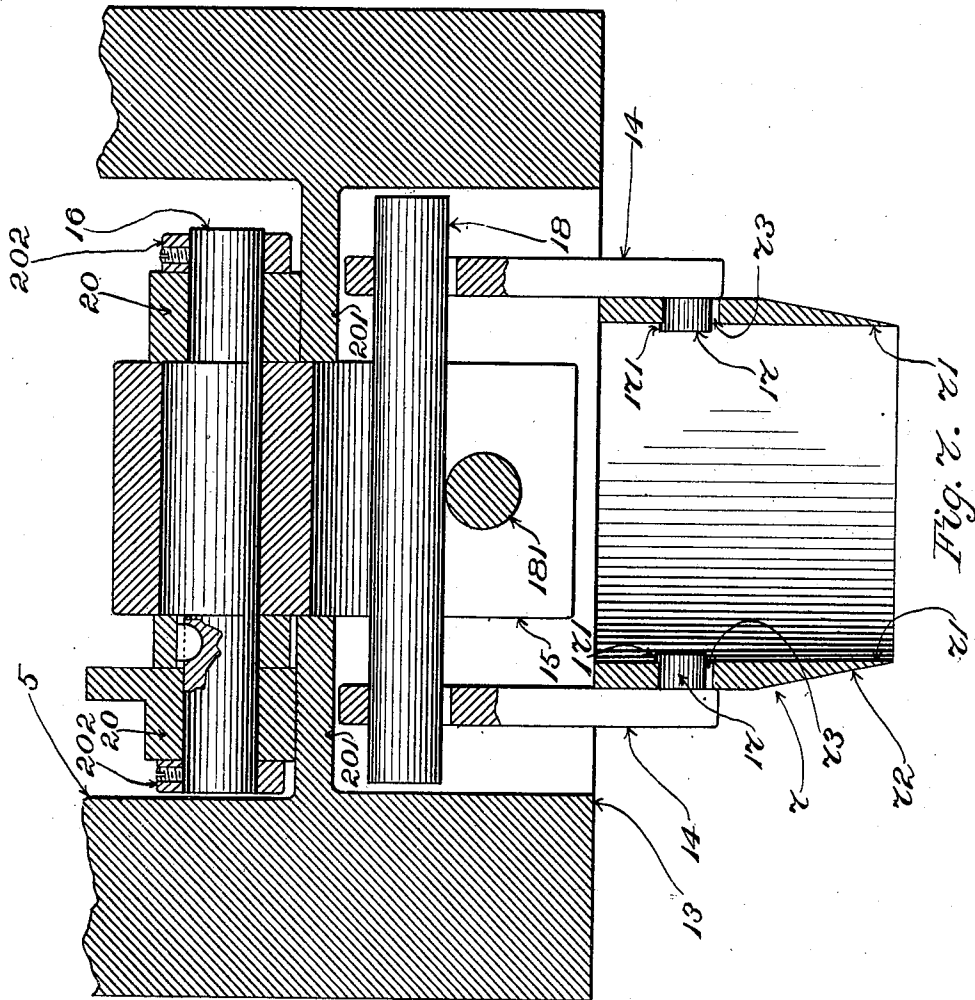
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J. B. TOUGAS.
POWER PRESS.

(Application filed Mar. 28, 1899.)

(No Model.)

6 Sheets—Sheet 5.



Witnesses:

Oscar F. Hill

Lepinett Hall Rice

Inventor:

John B. Tougas
by Maxced Salver & Randall

his Attorneys:

No. 651,060.

Patented June 5, 1900.

J. B. TOUGAS.
POWER PRESS.

(Application filed Mar. 28, 1899.)

(No Model.)

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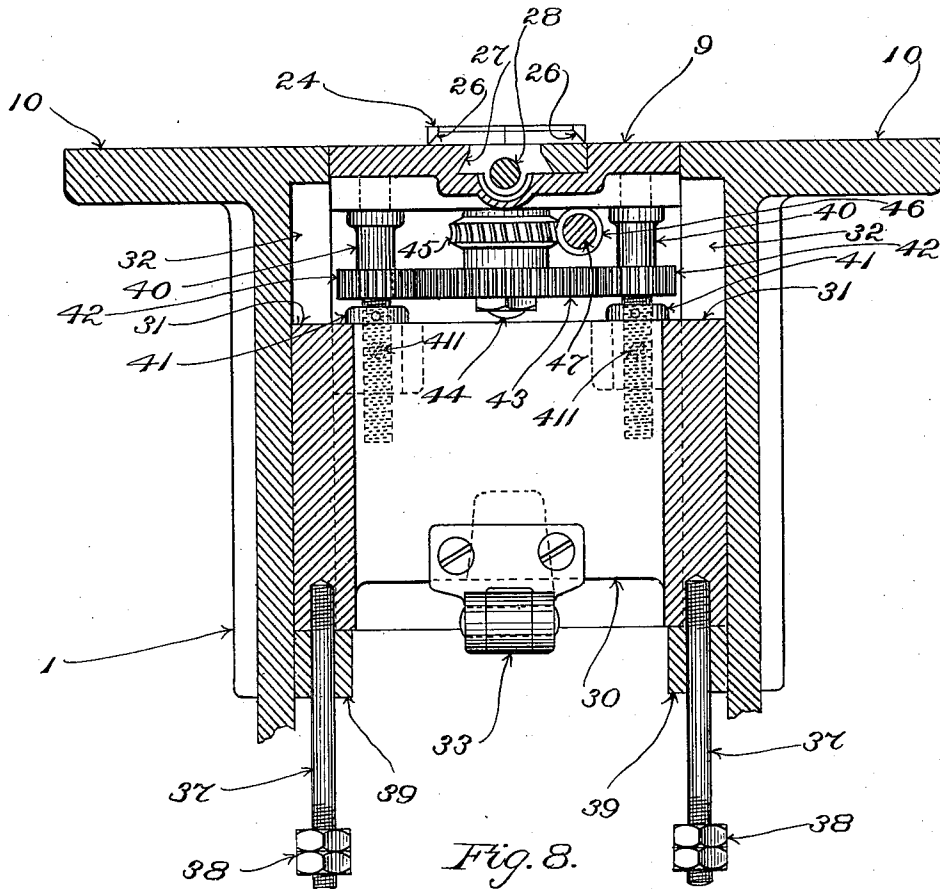


Fig. 8.

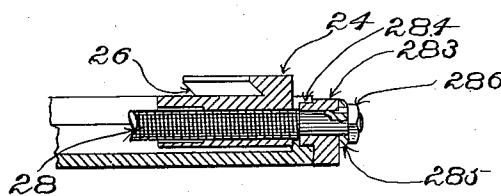


Fig. 9.

Witnesses:

Oscar F. Gill
Edith J. Anderson.

Inventor:

John B. Tougas
by Maceo Calver & Randall
his Attorneys.

UNITED STATES PATENT OFFICE.

JOHN B. TOUGAS, OF WORCESTER, MASSACHUSETTS.

POWER-PRESS.

SPECIFICATION forming part of Letters Patent No. 651,060, dated June 5, 1900.

Application filed March 28, 1899. Serial No. 710,791. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. TOUGAS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Power-Presses, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is in part in the nature of an improvement upon that which is presented in United States Letters Patent to Louis T. Tougas, No. 277,085, granted May 8, 1883. The said patent presents devices for cutting from sheets of elastic material, such as india-rubber, blanks with bevel edges—such, for instance, as the soles of rubber boots and shoes. In the said patent there are shown and described a cutting-die and a plunger or cutting-block, the latter having a portion of its face beveled or bulged outwardly, whereby when the two are compressed against each other, with a sheet of elastic material between them, the central portion of the plunger or cutting-block enters the die and forces into the central opening of the die the material which is to be severed, and then the said material is severed, leaving a bevel edge upon the article thereby cut out.

My invention has for its general object to provide an improved form of machine which shall be adapted especially to operate automatically the cutting-die and cutting-block aforesaid for the attainment of the results which have been set forth. More particularly, certain objects of the invention are to provide means for enabling the cutting-die and cutting-block to be quickly and conveniently applied and secured in place in the machine in such positions that the edge of the cutting-die shall make proper contact with the working surface of the cutting-block, as well as for enabling either or both of the said parts to be as quickly and conveniently removed and one or both of them to be replaced by others when desired, and to provide means for enabling adjustment to be made to compensate for wear and for variations in height when a substitution of different parts is made.

My said invention will now be described with reference to the accompanying draw-

ings, in which latter I have represented an embodiment thereof.

In the drawings, Figure 1 is a view showing in front elevation, with a small portion broken out, a machine constituting the said embodiment of the present invention. Fig. 2 is a side elevation of the said machine, with a small portion broken out. Fig. 3 is a view on a somewhat-larger scale, showing the table in plan, the upper portion of the framework being in horizontal section on line 3 3 of Fig. 1. Fig. 4 is a representation in side elevation of a cutting-die and cutting-block with a sheet of rubber between them, the parts being separated. Fig. 5 is a view in vertical transverse section on line 5 5 of Fig. 4, showing the cutting-die pressed down toward the cutting-block. Fig. 6 is a view in cross-section of a blank produced by the action of the cutting-die and cutting-block of Figs. 4 and 5. Fig. 7 is a view in transverse vertical section of the lower portion of the upper slide, its die-clamping devices, and the cutting-die held in place by the said devices. Fig. 8 is a view in similar section on the line 8 8 of Fig. 3 looking in the direction indicated by the arrows at the end of such line. Fig. 9 is a detail view in section on the plane indicated by the line 9' in Fig. 3 looking in the direction indicated by the arrow in such figure.

Referring to the drawings, 1 designates the framing of the machine in which the present invention is embodied, and 2 designates the operating-shaft of the said machine. In practice the said shaft will have combined therewith power-driving connections comprising a continuously-driven band-pulley or the like, a normally-open or inoperative clutch, devices whereby the said clutch may be shipped at the will of the operator, so as to rotate the said shaft, and devices to unship the clutch automatically and arrest the rotation of the shaft at the end of a single revolution thereof, all as usual in connection with various kinds of power-presses and the like machines. The said connections, &c., are or may be of any well-known or approved character, and as they are not immediately concerned or involved in the invention and as various forms thereof are in extensive use further description or illustration thereof is unnecessary,

and hence has been omitted. The said shaft 2 transmits movement through a crank or eccentric thereon at 3 and a connecting-rod 4 to the slide 5, the latter moving in ways or guides 6 6 at the opposite sides of the upper portion of the machine-framework 1. The said slide carries the cutting-die 7, by means of which and the coacting cutting-block 8 the cutting is effected. The said cutting-block is mounted upon the block-support 9, the latter being located at the middle of the table 10. Reference may be had to the detailed showing of the cutting-die and cutting-block which is made in Figs. 4 and 5. The said cutting-die 7 in practice will correspond in the contour of its cutting edge with the contour of the blank or article which it is designed to produce. Usually it is what is known as a "straight-edged" die, as shown clearly in Fig. 5—that is to say, the inner surface 71 of the blade or shell thereof is without transverse slant or obliquity at and adjacent to the cutting edge or is without any material slant or obliquity, the opposite surfaces 71 71 in Fig. 5 being parallel, or substantially so, while the outer surface 72 is the slanting or oblique one. The working portion of the cutting-block 8—that is to say, the portion of the said cutting-block which supports against the pressure of the cutting edge of the cutting-die the sheet 11 of elastic material that is to be cut and coacts with the said cutting edge in effecting the cut—is designated 81. This working portion in plan corresponds substantially in contour with the cutting edge of the cutting-die, as will be understood. The upper surface of the cutting-block, on which the sheet 11 is laid preliminary to being cut, is designated 82 and is or may be horizontal, or substantially so. The surface of the working portion 81 is transversely inclined or oblique, so as to stand in an oblique position with respect to the edge of the cutting-die, as shown clearly in Figs. 4 and 5. When, therefore, a sheet 11 of rubber is placed on top of the cutting-block, as in Fig. 4, and the cutting-die is moved toward the cutting-block, the central portion of the latter is received within the central opening of the cutting-die, while the outer portion of the said sheet is borne down by the edge of the cutting-die against the inclined or oblique working portion 81 of cutting-block 8, as indicated in Fig. 5. The particular portion of the sheet which thus is carried into contact with the said working portion 81 of the cutting-block assumes the same obliquity as the latter, which will be obvious, and consequently the cut which is made by the vertically-descending edge of cutting-die through the said portion of the sheet will be oblique with relation to the surfaces of the sheet. (See Fig. 5.) The blank or article 12, Fig. 6, which is produced by the closing of the cutting-die against the cutting-block will have its edges beveled off, as at 121 121, Fig. 6.

For the purpose of supporting the cutting-die the lower end of the slide 5 is furnished with the head 13 and with means of clamping the cutting-die against the under surface of the said head. The clamping devices shown herein comprise, essentially, the clamping-bars 14 14, to extend on opposite sides of the body of the cutting-die, the carrier 15, with which the said clamping-bars are connected loosely, the carrier-actuating shaft 16, and means of rocking the said shaft and holding it locked in the position that serves to cause the cutting-die to be clamped to its seat at the undersurface of the head 13. The clamping-bars 14 occupy vertical positions, their lower ends projecting below the under surface of the head 13 and being provided with means to engage with the body of the cutting-die. Herein the said clamping-bars are provided on their lower ends with inwardly-projecting pins or the like, as at 17 17, which enter and fit loosely in holes, as 73 73, that are formed in the opposite sides of the body of the cutting-die. The said clamping-bars have holes in their upper ends to enable them to be hung loosely upon the opposite ends of a round cross-bar 18. The said cross-bar in turn rests at its middle upon a pin 181, that is passed from front to rear through the lower end of the carrier 15. The looseness with which the clamping-bars are connected with the said cross-bar enables them to be adjusted freely toward and from each other on the cross-bar and transversely of the head 13, and thereby facilitates the operations of applying a cutting-die to the die-seat and engaging the said clamping-arms therewith, as well as the reverse operations of disengaging the clamping-arms from a cutting-die previously secured in position and removing the said cutting-die. The rocking of the cross-bar vertically upon pin 181 enables the respective clamping-bars to adapt themselves to the heights of the holes in the opposite sides of the cutting-die and enables both of said sides to be held with equal force. The carrier-actuating shaft 16 is journaled in bearings 20 20 at the upper part of head 13 and between the said bearings is formed with an eccentric portion fitting within a transverse bore in the upper part of the carrier 15. The shaft 16 is furnished also with means of rocking the same, herein constituted by an arm or handle 21, affixed to the said shaft. When the shaft is rocked in one direction or the other, the carrier and clamping-bars are raised or lowered. After the cutting-die has been placed between the lower ends of the clamping-bars and the pins 17 17 have been entered into the holes 73 73 in the cutting-die pressure exerted upon the handle 21 in the proper direction will partially rotate the shaft 16 and through the action of the eccentric portion thereof will draw the carrier upwardly, raising the cutting-die until its body is pressed firmly against the die-seat constituted by the under surface of the head 13. For the purpose of holding the cut-

ting-die firmly clamped against the said die-seat I apply to the handle 21 a pawl or catch 22, which takes into a toothed or ratchet segment 23 on one of the bearings 20. This pawl or catch is disengaged by pressure of the thumb of the operator of the machine thereupon when it is desired to lower the carrier to release the cutting-die.

For the purpose of conveniently connecting the cutting-block 8 to the block-support 9 with capacity for ready removal and replacing thereof the said block-support is furnished with block-clamps 24 24. The upper portions of these block-clamps are constructed with V-shaped recesses 25 25 to receive the rounded ends of the cutting-block, this shape of the said recesses enabling them to fit and hold properly any size of block. These recesses have undercut edges 26 26, under which the projecting lower edge of the cutting-block fits, the said edges fitting against the sloping or oblique working portion 81 of the cutting-block, and thereby provision is made for holding the cutting-block down against the surface of the block-support. The under portions of the block-clamps 24 24 are dovetailed to fit a slideway 27, that is provided in the block-support 9, and for the purpose of moving the said block-clamps simultaneously either toward or from each other, as may be required, I combine therewith a right-and-left screw 28, which is suitably journaled in bearings provided on the block-support, the reduced forward end of the said screw projecting at the front of the machine and having screwed thereon an externally-squared sleeve 281 to permit of the application thereto of a tool for turning the screw, and thereby adjusting or operating the block-clamps. The said sleeve is locked by a screw 282 to prevent it from turning on the end of screw 28.

Normally during the working of the machine the block-support 9 stands stationary, with the cutting-block affixed to the upper surface thereof, while the slide 5 and its head 13, with the cutting-die affixed to the latter, reciprocate vertically. In my machine herein presented the said block-support is supported upon a slide 30, the latter being furnished at its opposite sides with dovetails 31 31, (shown in dotted lines in Fig. 3,) fitting correspondingly-shaped guideways 32 32 on the machine-framing. For the purpose of enabling the operator at will to occasion a vertical movement of the slide 30 and block-support 9, mounted thereon, I connect with the said slide the forward arm of a lever 33, (see Figs. 2 and 8,) the latter being suspended by a pivoted link 34 from the framing 1 and having its rear arm connected by a link 35 with a treadle 36. Pressure of the operator's foot upon the said treadle raises the slide 30, while when the pressure is relaxed the slide descends to its normal position again. To limit the ascent of the slide, bolts 37 37 are applied to the opposite sides of its lower end,

the depending portions of the said bolts having thereon adjustable stops, constituted herein by nuts 38 38. In the ascent of the slide, occasioned by pressure of the operator's foot upon the treadle 36, these nuts come in contact with fixed portions 39 39 of the machine, and thereby prevent the slide from rising too far. The said nuts are set so as to make the stroke of the slide and parts which are carried thereby when actuated by the treadle exactly equal to the throw of the actuating crank-shaft and stroke of the head 13, which carries the cutting-die. In this way I provide against injury to the cutting-block or cutting edge of the die such as would result if the slide and block-support, with the cutting-block and cutting-die resting thereon, were pushed up too far by the action of the treadle. The described capacity of the slide for having vertical movement communicated thereto at the will of the operator is intended to facilitate the operation of setting the cutting-die and cutting-block in the machine in proper register with each other for working. It enables a very great economy of time to be effected in setting the said parts properly for engagement with each other. I first place the cutting-block 8 upon the block-support 9, securing it in position thereon by adjusting the block-clamps 24 24 so that they engage firmly with the opposite ends thereof. I then place the cutting-die 7 upon the said cutting-block, resting its cutting edge upon the oblique working portion 81 of the cutting-block. (See Figs. 1 and 2.) This causes the cutting-die to register accurately with the cutting-block. I then by pressure exerted upon treadle 36 cause the slide to rise, so as to carry the block-support 9 upward, together with the cutting-block secured thereto and cutting-die resting on the cutting-block, until the upper part of the body of the cutting-die is pressed firmly against the die-seat on the under part of the head 13 of the slide 5. While still holding the body of the cutting-die pressed against the said die-seat I introduce into the holes 73 73 in the body of the cutting-die the pins 17 17 on the clamping-bars 14 14, after which, through pressure exerted upon handle 21, I turn the carrier-actuating shaft 16 until the clamping-bars have been drawn up as far as the engagement of their pins with the cutting-die will permit, thereby clamping the cutting-die to the head 13. The engagement of the pawl or catch 22 on handle 21 with the ratchet-segment 23 will now hold the clamping-bars in place, so that when the pressure upon treadle 36 is relaxed and the slide is permitted to descend to its normal position the machine will be in readiness for being operated to cut out soles or the like.

In order to adapt the machine to the heights of the particular cutting-block and cutting-die which are employed therein at any given time and to permit of the use of different cutting-dies or cutting-blocks varying in height from one another, as well as to com-

5 compensate for the reduction in the height of a
 cutting-die which results from repeated
 sharpening thereof during use, I render the
 block-support 9 vertically adjustable upon
 10 the slide 30. Thus I employ four screws 40
 40, upon the upper ends of which the block-
 support 9 rests. Each of these screws is fitted
 to a nut 41, that is affixed to the slide, and
 each screw also has made fast thereto a pin-
 15 ion 42. The two pinions 42 42 at the front
 end of the block-support are in mesh with op-
 posite sides of an intermediate gear 43, while
 the two pinions at the rear end of the said
 20 block-support are in mesh with a like interme-
 15 diate gear 43. These gears 43 43 are mounted
 on studs 44 44, depending from the block-sup-
 port, while mounted to turn in unison with
 each gear is a worm-gear 45. The two worm-
 20 gears are engaged with worms 46 46 on a shaft
 47, that is journaled in bearings on the un-
 der part of the block-support, one end of the
 said worm-shaft projecting at the front of the
 machine and being suitably squared to re-
 25 ceive a tool for turning the same. By rotat-
 ing the said worm-shaft by means of such
 tool the height of the block-support is ad-
 justed, as required. The nuts 41 41 are ca-
 30 pable of being turned independently of one
 another for the purpose of leveling up the
 block-support and also of effecting adjust-
 ment of the various portions of the said block-
 support to compensate for any variation of
 height or the like in the different portions of
 35 the cutting-die or cutting-block, and after ad-
 justment thereof they are locked by clamp-
 ing-screws 411 411.

The upper sides of the pins 17 17 on the
 lower ends of the clamping-bars 14 14 are re-
 40 cessed to receive the edges of the holes 73 73,
 as shown in Fig. 7, the raised portions 171
 171 at the inner ends of the said pins pre-
 venting accidental disengagement of the
 clamping-bars from the cutting-die. The
 45 supporting cross-bar 18 for the said clamping-
 bars is free to move bodily backward and for-
 ward on the pin 181, applied to carrier 15, so
 as to enable the said clamping-bars and cross-
 bar to be adjusted forwardly or rearwardly
 of the head 13 to suit the position of the holes
 50 73 73 after the cutting-die has been placed in
 proper register with the cutting-block and,
 while resting upon the latter, has been raised
 up against the die-seat upon the under sur-
 face of head 13 by means of pressure exerted
 55 against the treadle 36. The cross-bar 18 also
 is free to swing or shift horizontally on the
 pin 181 to enable the clamping-bars to ac-
 commodate themselves to the position of the
 holes 73 73 in case the latter have not been
 60 made exactly opposite each other in the sides
 of the cutting-die. The construction of the
 die-clamp, as will be perceived, renders the
 same adjustable universally in different di-
 65 rections to enable it to conform to the size
 and width of the cutting-die, to the position
 of the cutting-die as mounted on the cutting-
 block and presented to the die-clamp by the

lifting of the block-support and its support-
 ing slide through the action of treadle 36, and
 to variations in the positions of the holes 73 70
 73. The bearings 20 20 are provided in blocks
 that rest loosely upon the upper portions 201
 201 of the head 13, the said blocks sliding for-
 wardly and backwardly on the said portions
 as the eccentric shaft 16 is rocked. Collars 75
 202 202 are secured upon the outer ends of
 shaft 16 to keep the bearings, handle 21, and
 carrier 15 in place on the said shaft.

The rear end of screw-shaft 28 is fitted to
 a bearing 283, (see Figs. 3 and 9,) which is 80
 made fast to the rear end of the block-sup-
 port 9. Between the said bearing and the
 adjacent end of the threaded portion of the
 said screw-shaft is placed the loose collar 284,
 while on the opposite side of the said bearing 85
 is placed the washer 285, keyed to the screw-
 shaft, nut 286 being applied to the threaded
 extremity of the screw-shaft. By these de-
 vices the requisite end bearings are provided
 for the screw-shaft. 90

I claim as my invention—

1. In a die-press, in combination, the recip-
 rocating head, die-securing devices applied to
 the said reciprocating head which admit of the
 ready attachment and removal of cutting-dies 95
 of different shapes and sizes, the cutting-die
 engaged by the said devices and thereby held
 to the said head, the cutting-block corre-
 sponding in contour with the blank to be pro-
 duced, the block-support, a movable carrier 100
 on which the said block-support is mounted,
 and means connected to said movable carrier
 and operable at the will of the operator to
 move the block-support toward the said re-
 ciprocating head for the purpose of applying 105
 to the die-securing devices on the latter a cut-
 ting-die resting on its cutting-block on the
 said block-support, substantially as described.

2. In a die-press, in combination, the recip-
 rocating head, die-clamping devices applied 110
 to the said head which admit of the ready at-
 tachment and removal of cutting-dies of dif-
 ferent shapes and sizes, the cutting-die en-
 gaged by the said devices and thereby held
 to the said head, the cutting-block correspond- 115
 ing in contour with the blank to be produced,
 the block-support, the slide on which the
 said block-support is mounted, and a treadle
 connected with the said slide and operable at
 the will of the operator to move the block- 120
 support toward the said reciprocating head
 for the purpose of applying to the die-clamp-
 ing devices on the latter a cutting-die resting
 on its cutting-block on the said block-sup-
 port, substantially as described. 125

3. In a die-press, the combination with a re-
 ciprocating head carrying a cutting-die, of a
 vertically-movable slide, a block-support car-
 ried by said slide, and means for adjusting
 said block-support relative to said slide, said 130
 means consisting of opposite pairs of screws
 beneath the ends of the said block-support,
 nuts fitted to said screws, pinions on said
 screws, gears intermediate the pinions of the

respective pairs of screws, worm-wheels connected with the said intermediate gears, and a worm-shaft engaging with the said worm-wheels.

5 4. The combination with the block-support having a guideway, of the block-clamps fitted to the said guideway and provided with V-shaped recesses for the reception of the opposite ends of the cutting-block, the said recesses having undercut edges to fit over the said ends and hold them down upon the block-support, and the right-and-left screw-shaft for adjusting the said block-clamps, substantially as described.

15 5. The combination with the head having a die-seat, of the clamping-bars, the cross-bar on which the said clamping-bars are loosely mounted, the carrier on which the said cross-bar is loosely hung, the eccentric shaft mounted on the said head and having the carrier fitted thereto, and means to turn and lock the said eccentric shaft, substantially as described.

25 6. The combination with the head having a die-seat, of the clamping-bars, the cross-bar on which the said clamping-bars are loosely mounted, the carrier on which the said cross-bar is loosely hung, the eccentric shaft mounted on the said head and having the carrier

fitted thereto, the handle fixed on the said eccentric shaft and provided with the catch or pawl, and the fixed toothed segment on the said head, substantially as described.

7. The combination with the head having a die-seat, of the clamping-bars, the cross-bar on which the said clamping-bars are loosely mounted, the carrier, the cross-pin on which the said cross-bar rests and on which it is free to move both vertically and horizontally, and means to raise and lower the said carrier relatively to the head, substantially as described.

8. The combination with the head having a die-seat, of the clamping-bars, the cross-bar on which the said clamping-bars are loosely mounted, the carrier by which the said cross-bar is supported, the eccentric shaft, means of actuating the said shaft, and bearing-blocks for the said shaft mounted on the head with capacity to move back and forth horizontally as the shaft is rocked, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. TOUGAS.

Witnesses:

CHAS. F. RANDALL,
W. A. MACLEOD.