

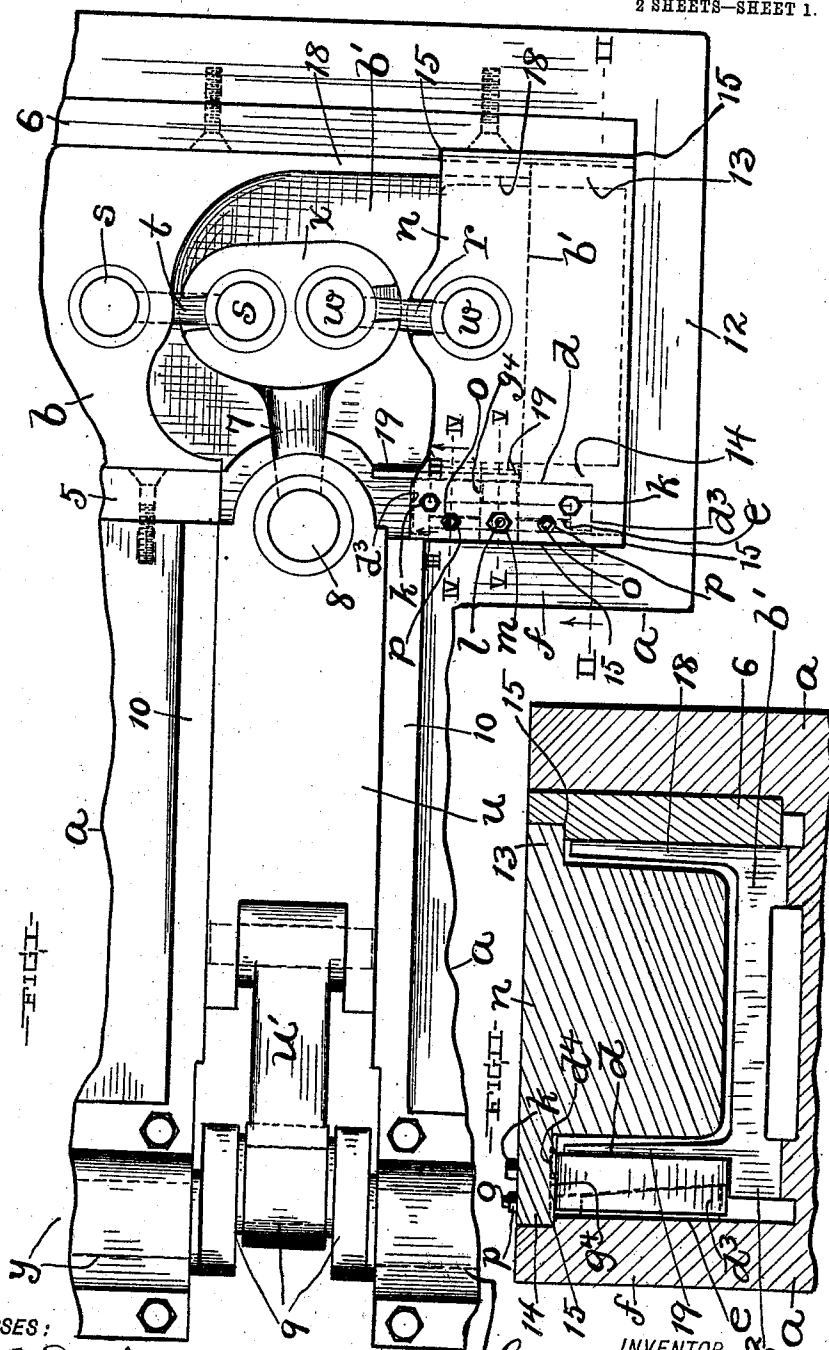
No. 814,955.

PATENTED MAR. 13, 1906.

G. W. GREENWOOD.
PRESSURE EXERTING MACHINE.

APPLICATION FILED OCT. 22, 1902

2 SHEETS—SHEET 1.



WITNESSES:

Daniel E. Daly,
Victor C. Lynch.

INVENTOR

George W. Greenwood

BY

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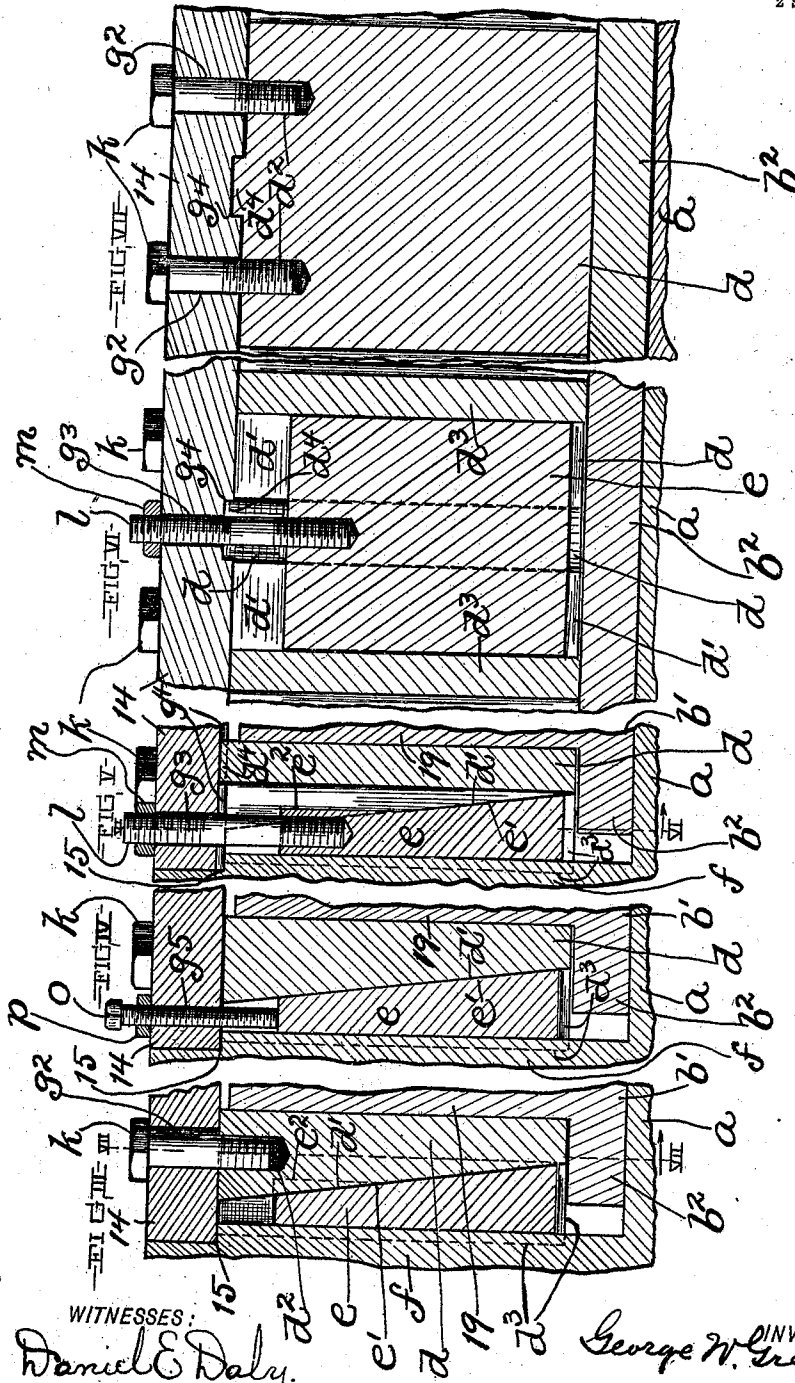
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UNITED STATES PATENT OFFICE.

GEORGE W. GREENWOOD, OF CLEVELAND, OHIO.

PRESSURE-EXERTING MACHINE.

No. 814,955.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed October 22, 1902. Serial No. 128,227.

To all whom it may concern:

Be it known that I, GEORGE W. GREENWOOD, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pressure-Exerting Machines; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in pressure-exerting machines suitable for use in gripping, pressing, and forging operations—as, for instance, in gripping or exerting pressure against a blank or stock which is to be converted or formed into a predetermined article of manufacture; and the invention pertains more especially to a machine of the character indicated which comprises a suitably-guided pressure-exerting block capable of reciprocation and actuated by a suitably-operated toggle-joint.

The primary object of this invention is to distribute the strain upon the pressure-exerting block over a large portion of the stationary framework or bed of the machine and to effectually prevent twisting or wobbling or displacement of the said block and to provide a simple, durable, and convenient laterally-adjustable side bearing for an upwardly-projecting flange with which an extension of the aforesaid block is provided.

With this object in view and to the end of realizing other advantages hereinafter appearing the invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claim.

In the accompanying drawings, Figure I is a top plan of a portion of a pressure-exerting machine embodying my invention. Fig. II is a vertical section on line II II, Fig. I, looking in the direction indicated by the arrow. Fig. III is a vertical section on line III III, Fig. I, looking in the direction indicated by the arrow. Fig. IV is a vertical section on line IV IV, Fig. I, looking inwardly. Fig. V is a vertical section on line V V, Fig. I, looking inwardly. Fig. VI is a vertical section on line VI VI, Fig. V, looking in the direction indicated by the arrow. Fig. VII is a vertical section on line VII VII, Fig. III, looking in the direction indicated by the arrow. Figs. I and II are drawn on a smaller scale than the remaining figures.

Referring to Fig. I of the drawings, *a* designates the stationary horizontally-arranged bed of the machine, and *y* a suitably-driven crank-shaft, which is arranged horizontally at one end of and supported from the bed *a*. A pressure-exerting block *b* is arranged at and supported from the opposite end of the bed *a*. The block *b* is capable of reciprocation and has its line of travel arranged parallel with and a suitable distance from the shaft *y*. The block *b* is arranged to operate between two guide-forming walls 5 and 6, provided upon the bed *a* and arranged at the inner side and outer side, respectively, of the path of the said block. The walls 5 and 6 are formed by bars rigidly secured to the body portion of the bed *a*. The block *b* is operated by a toggle-joint arranged at one end of the said block between the latter and a thrust-block *n*. The said toggle-joint has its knuckle *x* provided with a shank or arm 7, which extends toward the slide *u* and is pivoted vertically, as at 8, to the said slide. The slide *u* is capable of reciprocation and arranged to operate between the shaft *y* and the block *b*. The path of the slide *u* is arranged at a right angle to the path of the block *b*. The toggle-joint is therefore operatively connected at its knuckle *x* with a slide *u*, which is operatively connected by a pitman *u'* with the crank 9 of the shaft *y*, and the bed *a* is provided with walls 10, arranged to form guides for the said slide.

The two links *r* and *t* of the toggle-joint connect the toggle-knuckle *x* with the blocks *n* and *b*, respectively. The toggle-joint is applied in the usual manner, having opposite ends of its link *t* pivoted vertically, as at *s*, to the toggle-knuckle *x* and to the block *b*, respectively, and having opposite ends of its other link *r* pivoted vertically, as at *w*, to the toggle-knuckle *x* and to the thrust-block *n*, respectively.

The pivotal attachment of toggle mechanism to the toggle-mechanism-operating slide, pressure-exerting block, and thrust-block of a pressure-exerting machine, is already so well known in the art that further description or illustration thereof in this application is not considered necessary.

The block *b* is provided at the bottom and at its toggle-joint-connecting end with a flat horizontally-arranged extension *b'*, which projects and extends in under the toggle-joint to and a suitable distance in under the thrust-block *n*.

The guide-bar 6, which, as already indicated, extends along the outer side of the travel of the block *b*, is extended toward and to the outer end of the thrust-block *n*.

- 5 The bed *a* is provided at the outer end of the thrust-block with a wall 12, against which the said end of the thrust-block abuts.

- The thrust-block *n* is provided at its upper end with two horizontally-arranged laterally-projecting flanges 13 and 14, which extend along the outer side and inner side, respectively, of the said block. The block extension *b'* extends to and in under the thrust-block *n* between the guide-bar 6 at the outer side of the thrust-block and a vertically-arranged wall *f*, with which the bed *a* is provided at the opposite or inner side of the thrust-block. The bar 6 and the wall *f* are recessed at the top, as at 15, to receive the flanges 13 and 14 of the thrust-block, which flanges rest upon the bottoms of the said recesses, so that the thrust-block is supported at its said flanges 13 and 14 from the bar 6 and the wall *f*.

- 25 The block extension *b'* is provided at its outer side edge with an upwardly-projecting flange 18, extending along and engaging the inner side of the outer guide-bar 6. The said extension *b'* adjacent its inner side edge is provided with an upwardly-projecting flange 19, arranged to extend along and have lateral bearing against a laterally-adjustable plate *d*. The flange 19 does not extend inwardly in the direction of the toggle-joint far enough to interfere with the location and operation of the said joint. The block extension *b'* and its flanges 18 and 19 obviously enlarge the bearing-forming and wearing surfaces of the block *b*, so as to avoid twisting or wobbling of the said block during the operation of the toggle-joint, and any strain upon the block *b* is more widely distributed over the bed *a*.

- The thrust-block *n* does not engage the block extension *b'* and flanges 18 and 19, so as to avoid interference with the operation of the pressure-exerting block *b*. The bed *a* next below the block extension *b'* forms the bottom of the slideway which is formed in the bed and engaged by the said member *b'*. The bar 6 forms the outer side wall of the said slideway and, as already indicated, the plate *d* forms the opposite side wall of the said slideway. The lateral adjustability of the plate *d* renders the said plate capable of being readjusted to take up any wear occasioned between the said plate and the slide, and suitable means, as will hereinafter appear, is provided for securing the said plate in the desired adjustment. A vertically-adjustable plate *e* is arranged at the back side of the laterally-adjustable plate *d*, between the latter and the upright wall *f* of the bed *a*. The block extension *b'* is provided at the bottom with a flange *b''*, which extends

in under the plates *d* and *e*. The flange 14 of the thrust-block *n* extends over and completely covers the plates *d* and *e*. The flange 14 forms, therefore, a guard arranged to exclude dust, dirt, &c., from between the plates *d* and *e*, from between the plate *e* and the wall *f*, and from between the plate *d* and the flange 19.

The vertically-adjustable plate *e* (see Figs. III, IV, and V) is provided upon its slide-facing side with a surface *e'*, which slopes downwardly toward and faces the path of the block extension *b'*. The laterally-adjustable plate *d* (see also Fig. IV) is provided on its back side with two surfaces *d''*, which slope downwardly toward the said path and are arranged a suitable distance apart longitudinally of the said plate. The slope of the surfaces *d''* correspond with and face and are engaged by the sloping surface *e'* of the plate *e*. It will be observed, therefore, that the plate *e*, having the sloping surface *e'*, forms a wedge which is arranged with its thicker portion lowermost and is interposed between the sloping surfaces of the plate *d* and the fixed wall *f*, and that an elevation of the wedge-forming plate *e*, when the plate *d* is free to be readjusted laterally, results in an actuation of the said plate *d* laterally toward the path of the block extension *b'*, and the plate *d*, when it has been properly adjusted relative to the said path, is secured in the desired adjustment.

The means employed for securing the laterally-adjustable plate *d* in the desired adjustment comprises not only the plate *e* and means which secure the said plate *e* in the desired adjustment, but also two vertically-arranged bolts *k*, which extend loosely through holes *g''*, formed in and extending vertically through the flange 14, (see Figs. III and VII,) into correspondingly-threaded holes *d''*, formed in the upper portion of the said plate *d*. The holes *g''* are elongated toward the path of the member *b'*, as shown very clearly in Fig. III, to accommodate a readjustment of the plate *d* relative to the said path. Obviously, therefore, the side-bearing forming-plate *d* is rendered free to be readjusted or secured in the desired adjustment, according as the bolts *k* are loosened or tightened relative to the flange 14, and the said plate *d* is drawn tightly against the under side of the said flange or loosened relative to the said flange, according as the bolts *k* are operated to tighten or loosen them relative to the said flange.

The laterally-adjustable plate *d* is provided at its ends or a suitable distance apart longitudinally of the plate with two laterally-projecting flanges *d''*, which are arranged, preferably, at right angles to the plate and extend across opposite ends, respectively, of the wedge-forming plate *e*.

The laterally-adjustable plate *d* is provided

at its upper edge and centrally between its ends with an upwardly-projecting tongue d^4 , which extends transversely of the said edge at right angles to the path of the block extension b' and engages a correspondingly-arranged recess g^4 , which is formed in the under side of the flange 14 and extends the full width of the said flange. The mutually-engaging tongue d^4 and recess g^4 are instrumental in preventing displacement of the plate d longitudinally.

The wedge-forming plate e is provided centrally between its ends, as shown more clearly in Figs. V and VI, with a vertically-arranged stud l , which is screwed into or otherwise fixed to the upper edge or top of the said plate. The stud l extends upwardly and loosely through a correspondingly-arranged hole g^3 , formed in the flange 14. A nut m is mounted on the stud l at the top of the flange 14, and obviously the stud l and consequently the plate e are elevated or lowered, according as the nut is turned in the one direction or the other, and the plate e is tightened or loosened relative to the flange 14, according as the said plate e is raised or lowered.

Two vertical screws o extend into engagement with the top of the wedge-forming plate e and are arranged a suitable distance apart longitudinally of the said plate at opposite sides, respectively, of the stud l . Each screw o extends into engagement with the upper edge of the plate e through a correspondingly-threaded vertical hole g^5 , formed in the flange 14, as shown in Fig. IV, and a lock-nut p is mounted on the said screw at and contiguous to the upper side of the said flange.

By the construction hereinbefore described it will be observed that withdrawal of the screws o upon loosening the lock-nuts p accommodates a lifting or raising of the plate e by properly manipulating the nut m to readjust the plate d when the latter is rendered free to be readjusted relative to the path of the block extension b' . The upper portion of the wedge-forming plate e is enlarged in thickness, as at e^2 , toward the plate d between the sloping surfaces d' of the said plate d to accommodate the provision of the stud l , as shown in Fig. V.

Reference is hereby made to Letters Pat-

ent No. 728,224, granted to me May 19, 1903, which Letters Patent disclose and cover a laterally-adjustable side bearing for slides or reciprocating members, regardless of the location of the bearing. My present application discloses the application of the said side bearing adjacent the thrust-block of a pressure-exerting machine, and the subject-matter of this application comprises, essentially, the provision on the thrust-block of a flange which overlaps the laterally-adjustable bearing-affording plate of the side bearing, with a tongue-and-groove connection between the under side of the flange and the said plate and with the said tongue-and-groove connection arranged transversely of the upper edge of the said plate to accommodate the lateral adjustment of the plate without displacement of the plate endwise relative to the thrust-block.

What I claim is—

The combination, with a toggle-joint, means for operating the toggle-joint; a stationary thrust-block connected with one link of the toggle-joint; a pressure-exerting block operatively connected with the other link of the toggle-joint; means for guiding the pressure-exerting block, and the said pressure-exerting block having an extension which extends in under the said joint to and in under the thrust-block and has an upwardly-projecting flange formed thereon adjacent to the inner side edge of the said extension, of a laterally-adjustable plate affording bearing to the outer side of the said flange; means for shifting or adjusting the said plate laterally relative to the aforesaid flange and holding the said plate in the desired adjustment; there being a flange formed upon the thrust-block at the top and inner side of the block and overhanging the aforesaid plate, and means for preventing displacement of the aforesaid plate endwise independently of the flange of the thrust-block without interfering with the lateral adjustability of the plate.

In testimony whereof I sign the foregoing specification, in the presence of two witnesses, this 29th day of September, 1902, at Cleveland, Ohio.

GEORGE W. GREENWOOD.

Witnesses:

CHAS. H. DORER,
TELSA SCHWARTZ.