

No. 684,058.

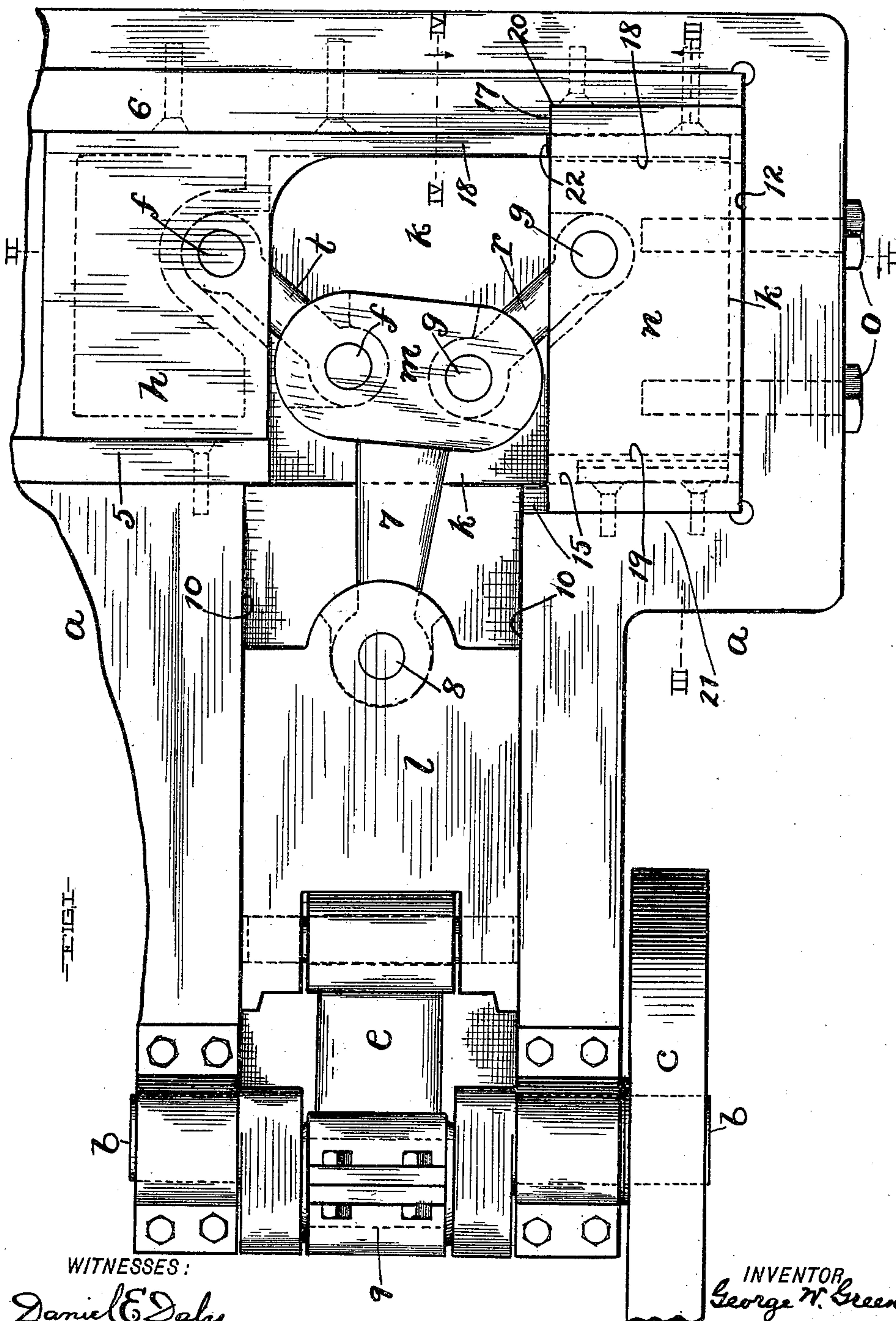
Patented Oct. 8, 1901.

G. W. GREENWOOD.
PRESSURE EXERTING MACHINE.

(Application filed July 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Daniel E. Daly.
A. H. Parratt

INVENTOR

George W. Greenwood

BY

Lyndell W. Wares
his ATTORNEYS

No. 684,058.

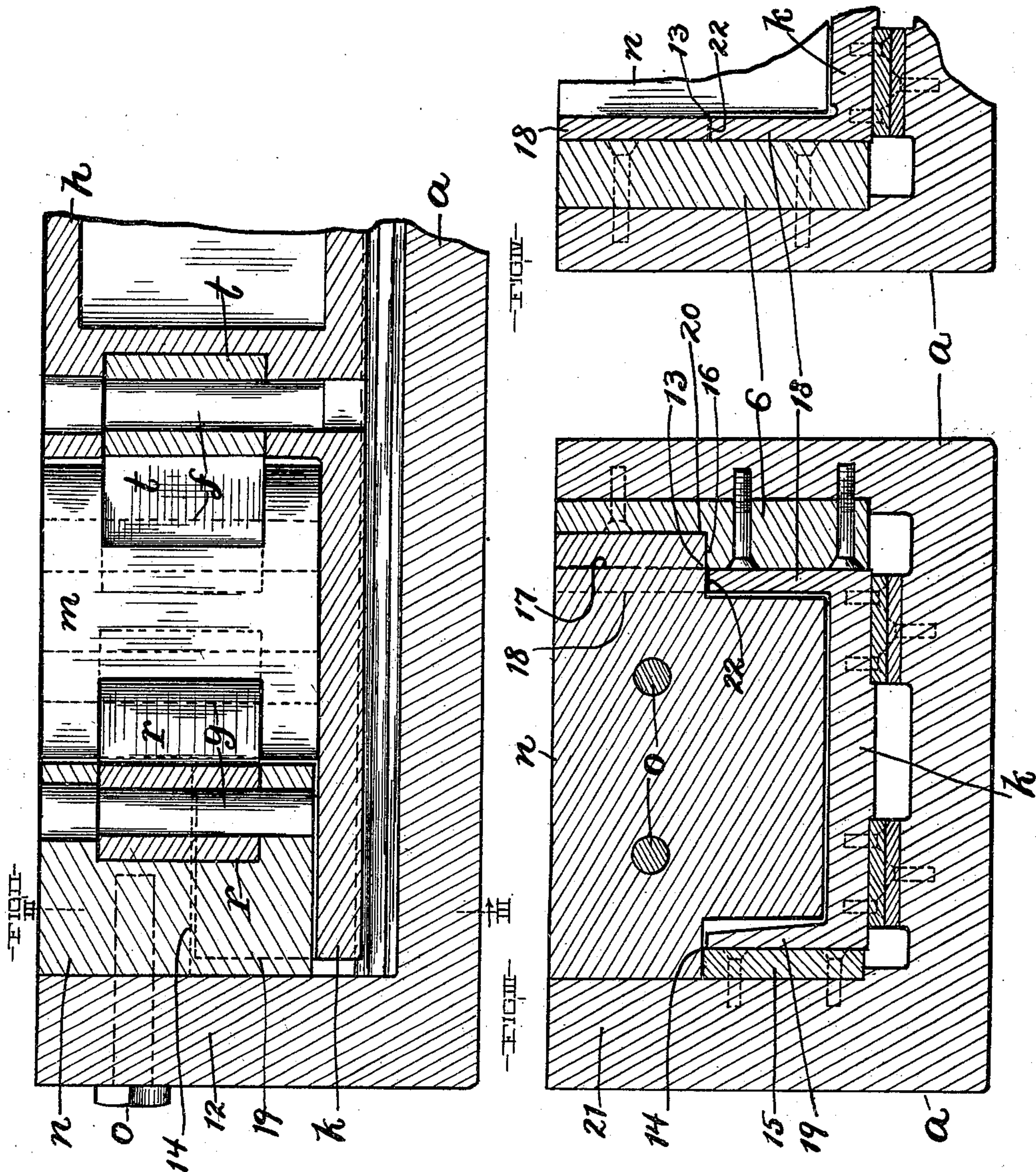
Patented Oct. 8, 1901.

G. W. GREENWOOD.
PRESSURE EXERTING MACHINE.

(Application filed July 8, 1901.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

Daniel E. Daly

A. H. Parratt

INVENTOR

George W. Greenwood

BY

Symonds & Co.
his ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE W. GREENWOOD, OF CLEVELAND, OHIO.

PRESSURE-EXERTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 684,058, dated October 8, 1901.

Application filed July 8, 1901. Serial No. 67,456. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. GREENWOOD, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pressure-Exerting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it pertains to make and use the same.

My 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 the blank or stock which is to be converted or formed into bolts, rivets, and similar articles; 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 said pressure-exerting block over a greater portion of the stationary framework or bed of the machine and to more effectually prevent twisting or wobbling or displacement of the said block.

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

In the accompanying drawings, Figure I is a top plan of a pressure-exerting machine embodying my invention. Fig. II is a vertical section on line II II, Fig. I, looking inwardly. Fig. III is a vertical section on lines III III, Figs. I and II, looking in the direction indicated by the arrow. Fig. IV is a vertical section on line IV IV, Fig. I, looking in the direction indicated by the arrow.

Referring to the drawings, *a* designates the stationary horizontally-arranged bed of the machine, and *b* a crank-shaft, which is arranged horizontally at one end of and supported from the bed *a*. The shaft *b* is provided at one end with a driving-pulley *c*.

A pressure-exerting block *h* is arranged at and supported from the opposite end of the

bed *a*. The block *h* is capable of reciprocation and has its line of travel arranged parallel with the shaft *b*. The shaft *b* and the block *h* are arranged, therefore, parallel and a suitable distance apart longitudinally of the bed *a*.

The block *h* is arranged to operate between two guide-forming walls 5 and 6, provided upon the bed *a* and arranged at the inner side and outside, respectively, of the said block. The walls 5 and 6 are formed, preferably, by bars rigidly secured to the body portion of the bed *a* in any approved manner.

The block *h* is operated by a toggle-joint arranged at one end of the said block *h* between the said block *h* and a thrust-block *n*. The said toggle-joint has its knuckle *m* provided with a shank or arm 7, which extends toward and is pivoted vertically, as at 8, to a slide *l*, which is capable of reciprocation and arranged to operate between the shaft *b* and the travel of the block *h*. The toggle-joint is therefore operatively connected at its knuckle *m* with the slide *l*, which is operatively connected by a pitman *e* with the crank 9 of the shaft *b*, 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 *m* with the blocks *n* and *h*, respectively. The toggle-joint is applied in the usual manner, having opposite ends of its link *t* pivoted vertically, as at *f*, to the toggle-knuckle and to the block *h*, respectively, and having opposite ends of its other link *r* pivoted vertically, as at *g*, to the toggle-knuckle *m* and to the thrust-block *n*, respectively.

The block *h* is provided at the bottom and at its toggle-joint-connecting end with a flat horizontally-arranged extension *k*, which projects and extends in under the toggle-joint and is arranged to extend in under and approximately to the outer extremity of the thrust-block *n* in the normal and non-pressing position of the toggle-joint, as shown in Figs. I and II.

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, and the said block is rigidly secured to the said wall by suitably-applied bolts *o*.

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

5 The thrust-block *n* has its lower portion narrower than its upper portion, as shown very clearly in Fig. III, so as to form two downwardly-facing shoulders 13 and 14 at the outer side and inner side, respectively, of the said block. The block extension *k* extends to and in under the thrust-block *n* between the guide-bar 6 at the outer side of the thrust-block and another guide-bar 15 at the opposite or inner side of the lower and narrower portion of the thrust-block. The guide-bar 15 is rigidly secured to the bed *a* in any approved manner and extends along the inner side of the lower and narrower portion of the thrust-block. Of course the guide-bars 20 6 and 15 are parallel.

The thrust-block *n* is seated at its shoulder 14 upon the inner guide-bar 15 and is seated at its shoulder 13 upon a ledge 16, formed upon the inner side of the guide-bar 6 by cutting away, as at 20, a portion of the inner side of the said bar 6 at the outer side of the thrust-block, and thereby reducing the thickness of the said bar 6 at the said outer side of the thrust-block above the shoulder 13. The 30 ledge 16 extends to the inner end of the thrust-block, where the formation of the said ledge, by cutting away the inner side of the bar 6, results in the formation of a vertically-arranged shoulder 17 upon the said bar, and the thrust-block has its inner end abutting against the said shoulder 17. It will be observed, therefore, that the thrust-block *n* is snugly confined between the shoulder 17 and the wall 12, and consequently strain upon 40 the bolts *o* during the operation of the toggle-joint is avoided.

The block extension *k* is provided at its outer side edge with an upwardly-projecting flange 18, extending along and engaging the 45 inner side of the outer guide-bar 6. The said extension *k* at its inner side edge is provided with an upwardly-projecting flange 19, arranged to extend along and engage the inner side of the inner guide-bar 15; but the last-mentioned guide-bar 15 and the adjacent flange 19 do not extend inwardly in the direction of the toggle-joint far enough to interfere with the location and operation of the said joint.

55 It will be observed that the guide-bars 6 and 15 extend to the upper edges of the flanges 18 and 19 and form adequate side bearings for the outer sides of the said flanges. The block extension *k* and its flanges 18 and 19 materially enlarge the bearing-forming and wearing surfaces of the block *h*, and consequently twisting or wobbling of the said block during the operation of the toggle-joint is positively and effectually avoided. 60 It will be observed, also, that the extension *k* and its flanges 18 and 19 are important, because thereby the strain upon the block *h*

during the operation of the toggle-joint is more widely distributed over the bed *a*.

The thrust-block *n* has its upper and wider 70 portion closely confined laterally between the upper thinner portion of the outer guide-bar 6 and a wall 21, formed upon the bed *a* at the inner side of the said upper and wider portion of the block, and consequently lateral 75 strain upon the said block during the operation of the toggle-joint cannot result in strain upon the bolts *o*.

The flange 18 has the upper portion of its outer end cut away, as at 22, to accommodate the extension of the said flange in under the upper and wider portion of the thrust-block *n*, adjacent to the shoulder 13 of the said block; but the said flange 18 extends from end to end of the block extension *k* and 85 next to the block *h* extends upwardly to and flush with the top surfaces of the guide-bar 6 and thrust-block *n*.

What I claim is—

1. In a machine of the character indicated, 90 the combination, with a suitably-operated toggle-joint, a stationary thrust-block to which one link of the said joint is attached, a pressure-exerting block operatively connected with the other link of the toggle-joint and 95 capable of reciprocation, and means for guiding the last-mentioned block, of an extension formed upon the pressure-exerting block and extending in under the toggle-joint and in under the thrust-block in the non-pressing position of the said joint, and side bearings for the said extension, which side bearings extend along the sides of the thrust-block, substantially as and for the purpose set forth.

2. In a machine of the character indicated, 105 the combination, with a suitably-operated toggle-joint, a stationary thrust-block connected with one link of the said joint, a pressure-exerting block operatively connected with the other link of the toggle-joint, and 110 means for guiding the last-mentioned block, of an extension formed upon the pressure-exerting block and projecting or extending, in the non-pressing position of the toggle-joint, in under the said joint to and in under the 115 thrust-block, and having two upwardly-projecting flanges formed thereon along opposite side edges, respectively, of the said extension, and side bearings for the outer sides of the said flanges, substantially as and for 120 the purpose set forth.

3. In a machine of the character indicated, the combination, with a suitably-operated toggle-joint, a stationary thrust-block having one link of the toggle-joint attached thereto 125 and having its lower portion narrower than its upper portion, a pressure-exerting block operatively connected with the other link of the toggle-joint, and means for guiding the last-mentioned block, of an extension formed 130 upon the pressure-exerting block and projecting and extending in under the toggle-joint to and in under the thrust-block, and provided with two upwardly-projecting

flanges arranged at opposite sides, respectively, of the lower and narrower portion of the thrust-block, and side bearings for the said flanges, substantially as and for the purpose set forth.

4. In a machine of the character indicated, the combination, with a suitably-operated toggle-joint, a stationary thrust-block having one link of the toggle-joint attached thereto and having its lower portion narrower than its upper portion, a pressure-exerting block operatively connected with the other link of the toggle-joint, and means for guiding the last-mentioned block, of an extension formed upon the pressure-exerting block and projecting and extending, in the non-pressing position of the toggle-joint, in under the said joint to and in under the thrust-block and having two upwardly-projecting flanges arranged at opposite sides, respectively, of the lower and narrower portion of the thrust-block, with the outer of the said flanges extending upwardly above the lower and narrower portion of the thrust-block, and side bearings for the said flanges and extending to the upper edges of the flanges.

5. In a machine of the character indicated, the combination, with a toggle-joint, means for operating the said joint, a stationary thrust-block connected with one link of the toggle-joint and having its lower portion narrower than its upper portion so as to form two downwardly-facing shoulders 13 and 14 at the outer side and inner side, respectively, of the said block, a pressure-exerting block operatively connected with the other link of the toggle-joint, and means for guiding the last-mentioned block, of an extension formed upon the pressure-exerting block and normally projecting or extending in under the toggle-joint to and in under the thrust-block and having two upwardly-projecting flanges arranged at opposite sides, respectively, of the lower and narrower portion of the thrust-block, and stationary guide-bars forming side bearings for the outer sides of the said

flanges and having seats engaged by the aforesaid shoulders.

6. A machine of the character indicated, comprising a toggle-joint; means for operating the said joint; a stationary thrust-block having one link of the toggle-joint attached thereto and having its lower portion narrower than its upper portion so as to form two downwardly-facing shoulders 13 and 14 at the outer side and inner side, respectively, of the said block; the bed *a* having a wall 12 against which the outer end of the thrust-block abuts; bolts securing the thrust-block to the said wall 12; a pressure-exerting block operatively connected with the other link of the toggle-joint and provided, at the bottom, with an extension normally projecting or extending in under the toggle-joint to and in under the thrust-block and having two upwardly-projecting flanges 18 and 19 arranged at the outer side and inner side, respectively, of the lower and narrower portion of the thrust-block; the side bearing forming guide-bar 5 arranged at the inner side of the pressure-exerting block; the side bearing forming guide-bar 15 arranged at the outer side of the flange 19 and having its upper edge forming a seat engaged by the shoulder 14, and the side bearing forming guide-bar 6 extending along the outer side of the travel of the pressure-exerting block to and along the outer side of the thrust-block and along the outer side of the aforesaid flange 18, and the said bar 6 having its inner side cut away at the outer side of the thrust-block to form a ledge 16 which is engaged by the aforesaid shoulder 13, and to form, also, an upright shoulder 17 at the inner end of the thrust-block, substantially as shown, for the purposes specified.

Signed by me at Cleveland, Ohio, this 17th day of June, 1901.

GEORGE W. GREENWOOD.

Witnesses:

C. H. DORER,
A. H. PARRATT.