

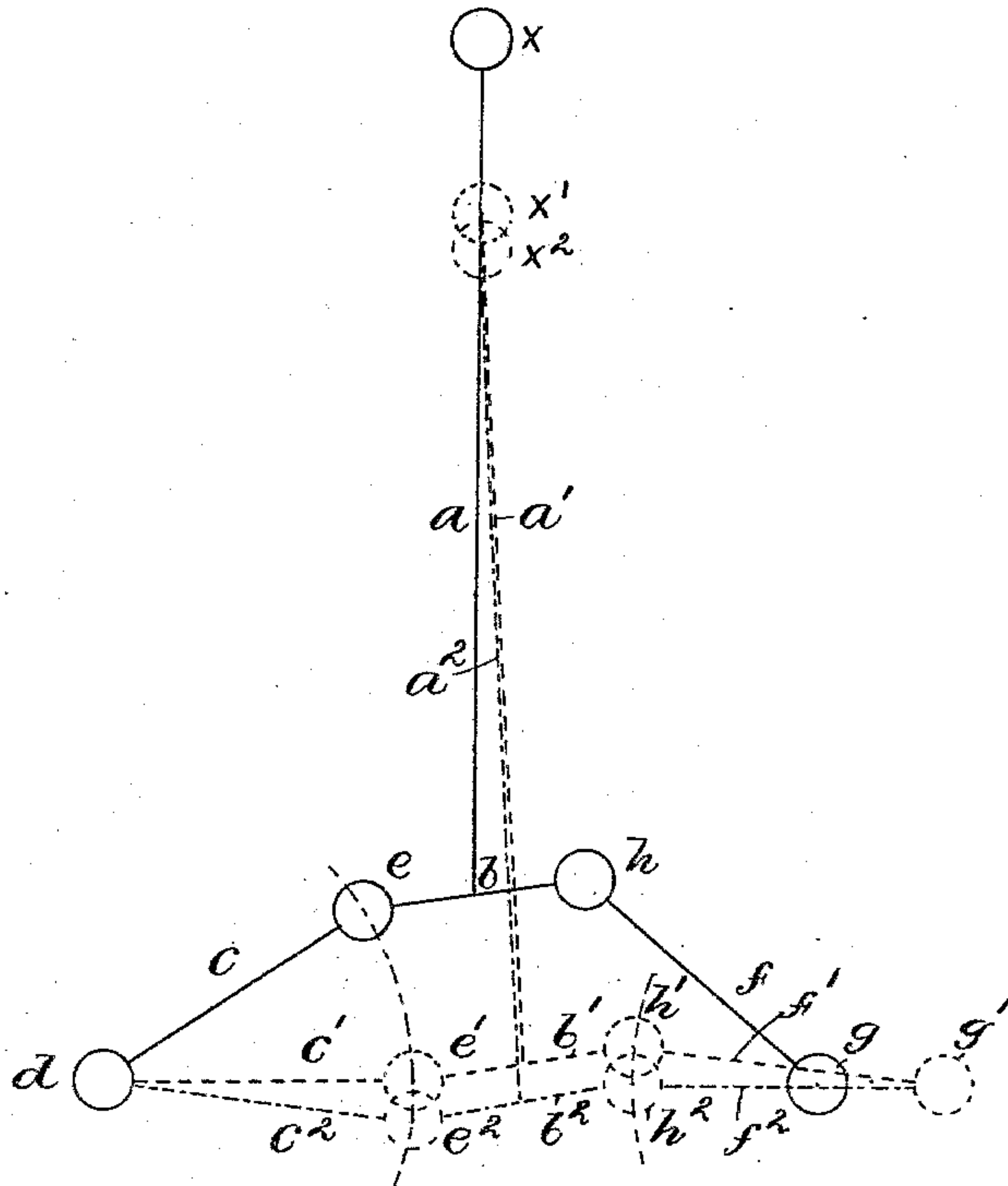
(No Model.)

H. P. EILERS.
MECHANICAL MOVEMENT.

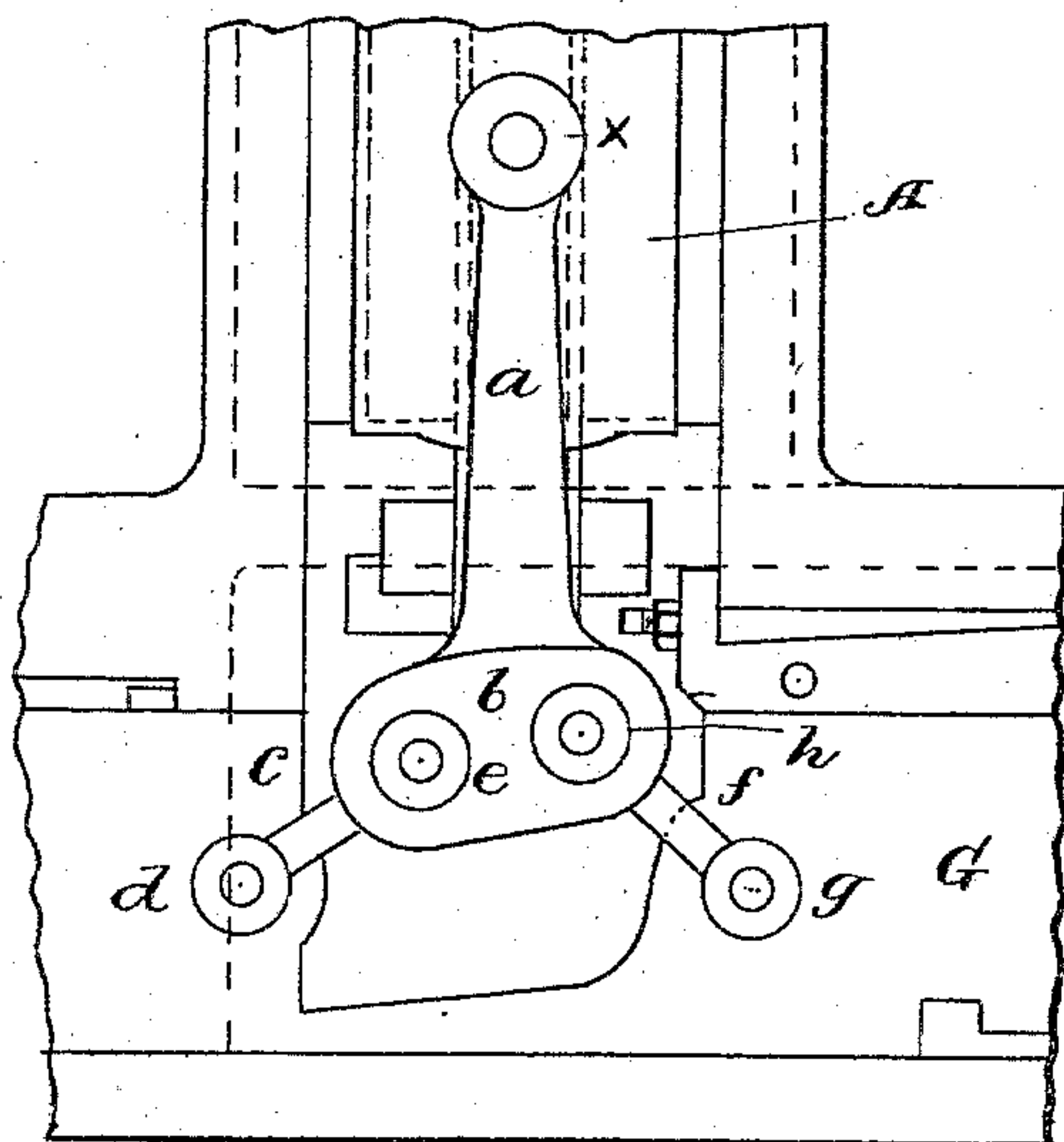
No. 553,113.

Patented Jan. 14, 1896.

- FIG. I -



- FIG. II -



WITNESSES,

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UNITED STATES PATENT OFFICE.

HIO P. EILERS, OF CLEVELAND, OHIO.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 553,113, dated January 14, 1896.

Application filed September 27, 1895. Serial No. 563,856. (No model.)

To all whom it may concern:

Be it known that I, HIO P. EILERS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In the annexed drawings, Figure I represents a diagram of three positions of the elements of my improved mechanical movement, and Fig. II a plan view of as much of a bolt heading or upsetting machine as will illustrate the application of such movement to such a machine.

In various machines and mechanical devices it is of advantage to obtain a movement in which the increased force of toggle-arms can be applied, and the moved element may be held stationary for a space of time while the element from which motion is derived continues its motion. For example, in bolt-heading machines and similar machines for upsetting metal rods or bolts the movable die of the pair of dies which hold the bolt or rod while it is upset is usually actuated by means of a pair of toggle-arms, one of which is pivoted to the die-slide and the other to a rigid point, and both of which are pivoted to a link-arm which is pivoted to a reciprocating slide. Said latter slide is reciprocated by suitable mechanism in the machine, but is continually moved, so that when the movable die is moved to grip the bolt or rod it almost immediately releases the same again. This is because the pivotal points of the toggle-arms upon the reciprocating link-arm are either concentric and coincident or in a line at right angles to the axial line of the link-arm. By staggering the pivotal points, so that the pivotal points of the toggle-arms upon the link-arm are in a line at an angle to the axial line of said arm other than a right

angle, the die-slide will reach its gripping position when the pivotal point of one arm comes into a straight line with the rigid pivotal point and the reciprocating pivotal point upon the die-slide, and the die-slide will remain in such position until the other arm comes into such straight line with said points, so that the die-slide will remain stationary for a certain space of time, dependent upon the angle of stagger of the pivot-points, while the actuating-slide, to which the link-arm is pivoted, continues to reciprocate and exert pressure.

The link-arm *a* is illustrated in Fig. II of the drawings as pivoted at a point *x* to a slide *A*, which receives reciprocating motion from suitable connection to moving parts of the machine. Said arm has a cross-head *b*, set at an oblique angle to the axial line of the arm, and a toggle-arm *c* is pivoted to a rigid point *d* and to a point *e* upon the cross-head. Another toggle-arm *f* is pivoted to a movable point *g* upon a movable die-slide *G* in Fig II and to a point *h* upon the cross-head.

The movement of the point *x*, which I shall term the "reciprocating actuating-point," as the actuating power is exerted thereon, is in a straight line, perpendicular to the line in which the point *g*, which I shall term the "reciprocating actuated point," is moved. The three successive positions in which the moving parts of the device are illustrated are respectively illustrated in full lines and two kinds of dotted lines and are respectively indicated by the same letters without potentials and with the potentials 1 and 2, such as *a b c*, &c., *a' b' c'*, &c., and *a² b² c²*, &c. The plain letters indicate the first position of the parts when the toggles are flexed. When the actuating-point has moved from *x* to *x'*, the fixedly-pivoted toggle-arm *c* will be in position *c'* in the line of reciprocation of the actuated point *g*. Said point has then reached the extreme, *g'*, of its stroke and will move no farther. As the actuating-point *x* moves to the position *x²*, the fixedly-pivoted toggle-arm *c* will move beyond the line of reciprocation, and the toggle-arm *f* of the actuated point will move into the line of reciprocation. As the pivot-point *e* moves to the left of the perpendicular line to *e²* and draws

the link-arm and the point h with it to h^2 , in the same direction, this latter part of the movement will have no effect in moving the actuated point, as the distances traveled toward the left by said points are the same. Upon the back stroke of the actuating-point the movement of the latter from x^2 to x' will likewise have no moving effect upon the actuated point, which will not move back until the fixedly-pivoted arm passes the line of reciprocation of the actuated point.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth respectively in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a mechanical movement, the combination of an actuating element pivoted at a point which receives rectilinear reciprocating motion, an actuated element arranged to reciprocate in a line at right angles to the line of movement of the actuating point, a toggle arm pivoted to said actuated element and to the actuating element, and a toggle arm pivoted to a fixed point in an extension of the line of reciprocation of the actuated point and to the actuating element,—the pivotal points of said toggle arms being arranged at an oblique angle to the axial line of the actuating element, substantially as set forth.

2. In a mechanical movement, the combination of a fixedly pivoted toggle arm, a toggle arm pivoted to a movable actuated element, and an actuating element to which the toggle arms are pivoted in a line oblique to the line of movement of the actuated element, substantially as set forth.

3. In a mechanical movement, the combination of a fixedly pivoted toggle arm, a toggle arm pivoted to a movable actuated element, and an actuating element to which the toggle arms are pivoted,—the fixed pivot point of the one toggle arm, the movable pivot point of the other toggle arm, and the pivot points upon the actuating element being staggered, *i. e.*, so arranged that they will not be in a straight line at any time, substantially as set forth.

4. In a mechanical movement, a link arm pivoted at a point which receives rectilinear reciprocating motion, an actuated element having reciprocating movement in a line at right angles to the movement of the pivotal point of the link arm, a toggle arm pivoted to said element and to the link arm, and a toggle arm pivoted to a fixed point and to the link arm,—the pivotal points of the toggle arms upon the link arm being in a line at an oblique angle to the axial line of the link arm, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 24th day of September, A. D. 1895.

H. P. EILERS.

Witnesses:

WM. SECHER,

DAVID T. DAVIES.