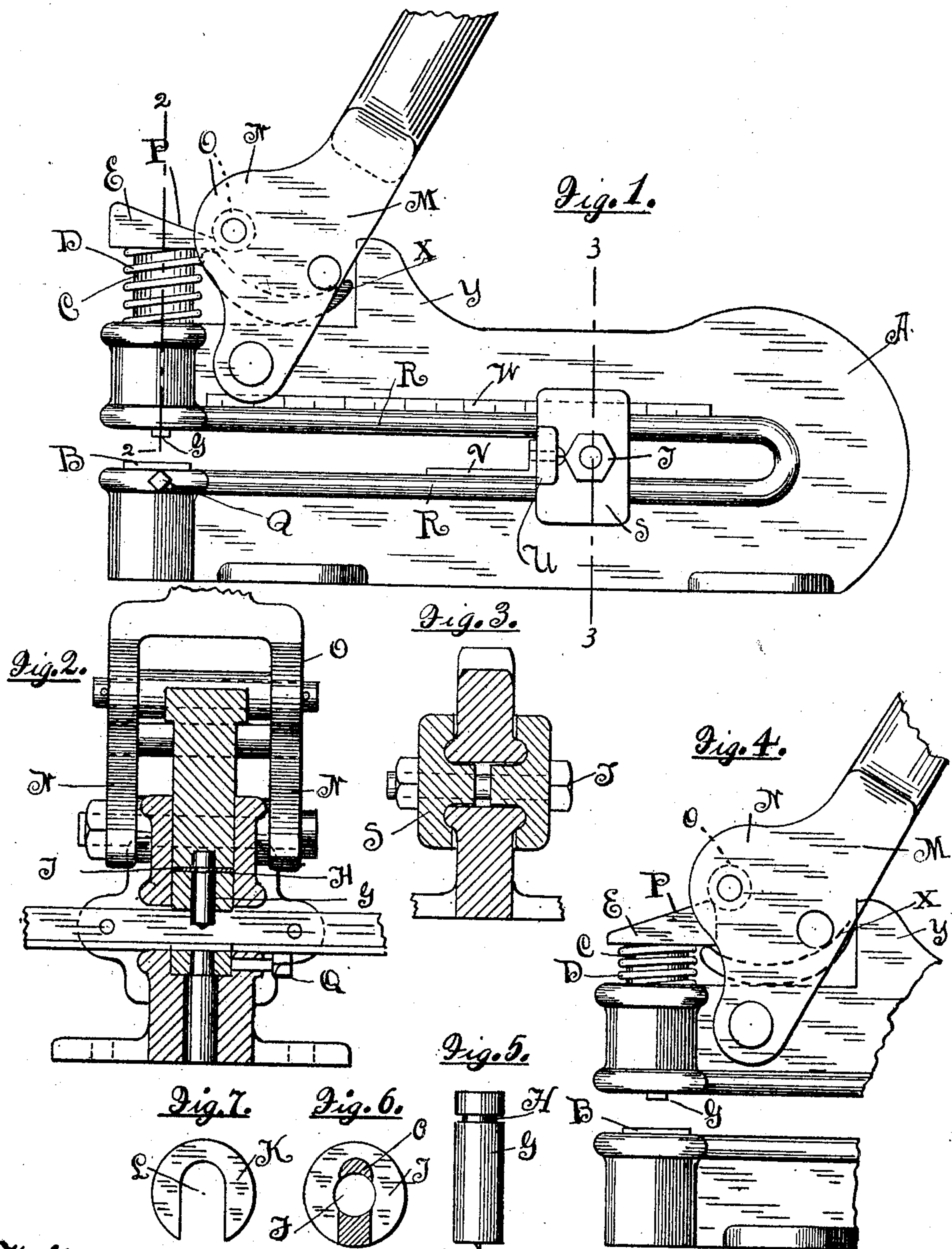


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PATENTED MAR. 6, 1906.

F. SCHULZ.
PUNCH PRESS.

APPLICATION FILED APR 10, 1905.



Witnesses
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PUNCH-PRESS.

No. 814,167.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRITZ SCHULZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Punch-Presses; and I do 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 appertains to make and use the same.

My invention relates to a novel construction in a punch-press, the object being to provide a device of this character of great strength, durability, and power, and in which the punches and dies for punching walls of various sizes can be readily interchanged, and in which the work or metal to be punched can be very easily adjusted and maintained in proper position; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of a punch-press constructed in accordance with my invention. Fig. 2 is a vertical transverse section of same on the line 2 2 of Fig. 1. Fig. 3 is a similar section on the line 3 3 of Fig. 1. Fig. 4 is a fragmentary detail side elevation showing the plunger for depressing the male member of the punch reversed in position to shorten its stroke and increase the relative leverage. Fig. 5 is a view in elevation of the male member of the punch. Fig. 6 is a horizontal section of the punch. Fig. 7 is a top plan view of a key-plate employed for securing the punch in the plunger.

My said punch-press consists of the horizontally-disposed U-shaped frame A, in the free end of the lower arm of which the female member B of the punch or die is adapted to be received. In the free end of the upper arm of said frame A a plunger C is vertically movable, which is held normally at the upper limit of its movement by means of a spiral compression-spring D, disposed between the head E thereof and the upper face of said upper arm. The said plunger C is provided in its lower end with a central opening F, in which the male member G of the punch or die is adapted to be received, the latter being provided with a peripheral groove H between its ends. Said punch C is provided between its ends with a recess J, extending almost completely around the same

and in which a key-plate K, having a U-shaped recess L of less width than the diameter of the member G and opening F, is adapted to be received, said plate being adapted to project into said recess H of the punch to hold same against longitudinal movement relatively to said plunger in one direction, said punch bearing at its upper end against the bottom wall of said central opening F of said plunger. Pivotaly secured to said upper arm, adjacent the free end thereof, is a lever M, having a bifurcated lower edge, the arms of which are provided with projections N, between which an antifriction-roller O is revolvably mounted, the latter being adapted to engage and bear upon the upper inclined face P of said plunger C when said lever is turned on its pivot in one direction to depress said plunger in an obvious manner. When said inclined face P of said plunger extends toward the pivot of said lever M, then the stroke of said plunger will become relatively long by reason of the fact that when said lever is swung forward and downwardly the roller O travels through an arc downwardly from its highest position, and therefore forces said plunger downwardly substantially twice as fast as its own travel; but when said inclined face P is oppositely disposed, as shown in Fig. 4, said plunger C will normally be held about midway between the upper and lower limits of its movement by its primary engagement with said roller O, and the latter when said lever is swung forward will travel downwardly through an arc only slightly greater than the incline of said face P, thereby depressing said plunger C only a short distance but with relatively enormous power, as will be obvious. For heavier work said plunger is so reversed. The width of the bifurcated lower end of said lever M is greater than the greatest width of said head E of said plunger, so that by turning the latter through an arc of ninety degrees the same will be thrown out of engagement with said roller O and can be removed by withdrawing same from its bearing in the free end of said upper arm in order to enable the male member of the punch or die to be removed and replaced by another member of different size or shape. The female member of the die is held in a socket provided therefor in the free end of the lower arm of the frame and is held in place by means of a set-screw Q. The said

arms of the frame A are provided with short flanges R on their adjacent edges and said flanges are adapted to be received in the recesses in the T-shaped members S, disposed on both sides of the frame A and held in engagement therewith by means of a bolt T, by means of which said members are clamped in position. The said members S are longitudinally movable in the recess between the upper and lower arms of said frame A and are provided on their outer faces with flanges U, to which a gage V is adapted to be secured, the said gage being adapted to determine the position of the blank to be punched in one direction, said gage being adapted to be moved to any desired position with said members S, and such position being determined by the scale W, mounted or otherwise provided on said upper arm of said frame. In punching heavier metal difficulty is frequently experienced in stripping the blank punched from the male member of the die, and as it is not generally practicable to provide a sufficiently heavy spring to insure stripping by reason of the fact that if spring of sufficient strength is not sufficiently compressible and, furthermore, reduces the maximum power which can be obtained by said lever M, I provide positive means, independent of the spring D, for stripping said male member, and to this end I provide a grooved plate X, which is adapted to rest upon the upper arm of said frame A, with its convex side only in travel being disposed in the path of a projecting portion of said head E of the plunger and its other end being disposed in the path of a member Y, mounted in the bifurcated lower end of the lever M adjacent the rear edge thereof. When said plunger is depressed, the inner end of the head thereof will engage and depress the forward end of said plate X, and in the event that the said plunger shall be held at the lower limit of its movement by friction the rear end of said plate will be maintained in a raised position in the path of said member Y, so that in raising the lever M to its primary position the rear end of said plate will be engaged and depressed by said member Y, thereby raising its forward end and said plunger in an obvious manner. The said plate may be loosely mounted or may be held in position by any suitable means.

It will be obvious that the members S are serving as a means for retaining suitable gages V in place, also serve, unless the blank be of great width, to reinforce the frame A between its ends in an obvious manner.

My said punch-press is exceedingly efficient and is particularly adapted to the needs of tinsmiths and cornice-makers and similar sheet-metal workers, particularly by reason of the little room occupied thereby and ease and rapidity with which the punches and dies can be removed and replaced to punch walls of various shapes and sizes.

The punch herein illustrated and described is adapted to be operated by hand; but it will be obvious that the same may be connected in a suitable manner to a source of power to be actuated thereby.

I claim as my invention—

1. A punch-press comprising a U-shaped frame having flanges bordering the recess therein and provided at its free ends with devices for retaining and operating dies, and reinforcing members comprising blocks having flanges adapted to engage the flanges of the frame between the ends of the recess.

2. A punch-press comprising a U-shaped frame having flanges bordering the recess therein and provided at its free ends with devices for retaining and operating dies, and reinforcing members comprising blocks having flanges adapted to engage the flanges of the frame between the ends of the recess, and means carried by said blocks for securing gages thereto by means of which the position of the blank to be punched is adjusted.

3. A punch-press comprising a U-shaped frame having flanges bordering the recess therein, clamping members adapted to engage said flanges between the ends of said recess and hold the arms against springing, means carried by said clamping members for securing gages thereto, a socket for a die in the free end of one arm, a plunger adapted to carry the punch in the free end of the other arm, and a lever pivotally secured to the last-named arm and adapted to engage and actuate said plunger.

4. A punch-press comprising a U-shaped frame having flanges bordering the recess therein, clamping members adapted to engage said flanges between the ends of said recess and hold the arms against springing, means carried by said clamping members for securing gages thereto, a socket for a die in the free end of one arm, a plunger adapted to carry the punch in the free end of the other arm, a head on said plunger having an inclined upper face, a lever pivotally mounted on said last-named arm and carrying a member adapted to ride over said inclined face and actuate said plunger in one direction, a member disposed in the path of said head and moved thereby in one direction and engaged by said lever to be moved in the opposite direction to return said plunger to the upper limit of its movement.

5. In a punch-press, the combination with a plunger and means for actuating same, of devices for removably retaining a punch therein comprising an opening in said plunger to receive the shank of the punch, an annular groove in the latter, a lateral recess in said plunger communicating with the opening therein, and a U-shaped plate adapted to enter said recess and project into said opening therein and into the annular groove in the shank of said punch to hold the latter

against longitudinal movement relatively to said plunger.

6. In a punch-press, a removable plunger having a central recess adapted to receive the shank of the punch and provided between the ends with a lateral recess communicating with said central recess between the ends of the latter, a punch having a shank adapted to enter said central recess and abut at one end against the bottom of the latter, said shank of said punch being provided with an annular groove between its ends adapted to register with said lateral recess in said plunger and project into said annular groove in the contained shank of the punch to hold the latter against longitudinal movement relatively to said plunger.

7. A punch-press comprising a U-shaped frame provided in the free end of one of its arms with a longitudinally-movable plunger provided with an enlarged head having an upper inclined face, a lever having a bifurcated lower end pivotally secured to said arm carrying said plunger adjacent the free end thereof, projections on said bifurcated end, and an antifriction-roller revolvably mounted between said projections and adapt-

ed to engage said inclined upper face of said head to depress said plunger when said lever is swung.

8. A punch-press comprising a horizontally-disposed U-shaped frame provided in the free end of its upper arm with a vertically-movable plunger having an enlarged head, the latter having an inclined upper face, an upwardly-extending lever pivotally secured to said upper arm adjacent the free end thereof and adapted to be swung forward and back, an antifriction-roller carried by said lever and adapted to ride over said inclined upper face of the head of said plunger to depress the latter, said roller traveling in an arc beginning at substantially the upper limit of its movement and intersecting the plane of said inclined upper face of said plunger.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

FRITZ SCHULZ.

Witnesses:

RUDOLPH WM. LOTZ,
F. SCHLOTFELD.