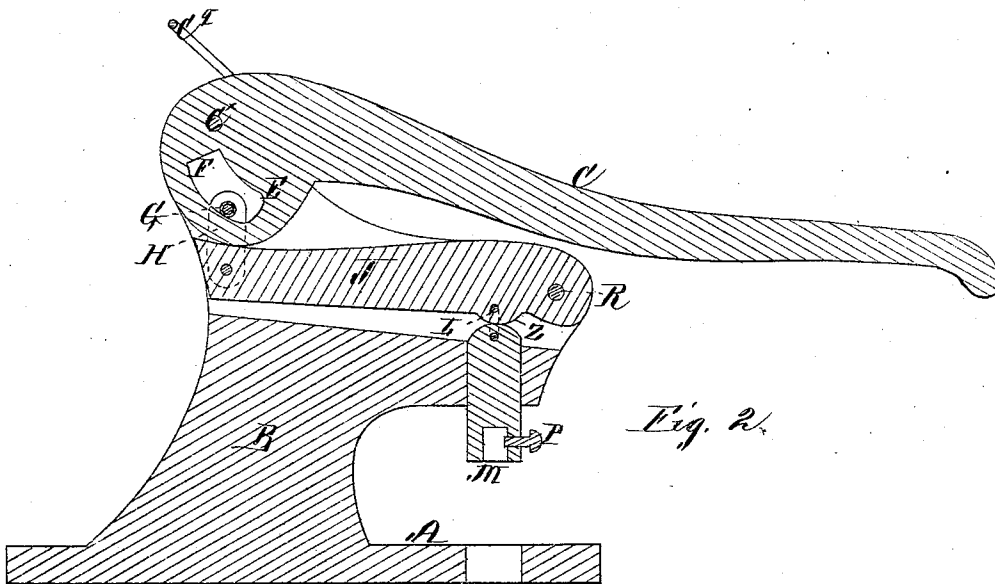
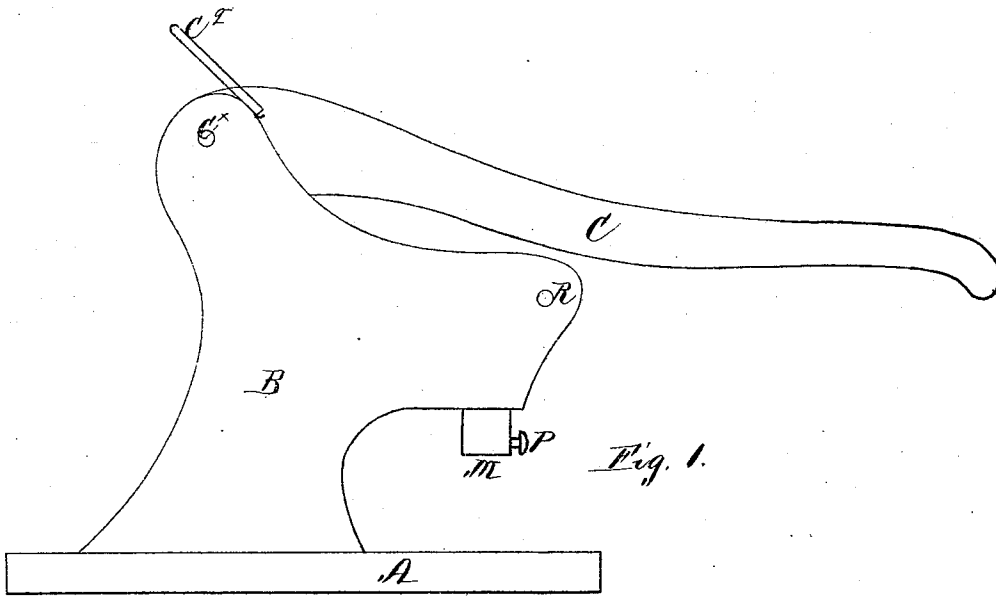


S. F. LEACH.
Hand-Punches for Metals.

No. 145,578.

Patented Dec. 16, 1873.



Witnesses,
 Lemuel P. Hanks
 Howard M. Bowers.

Inventor,
 Samuel Frederick Leach

UNITED STATES PATENT OFFICE

SAMUEL FREDERICK LEACH, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN HAND-PUNCHES FOR METAL.

Specification forming part of Letters Patent No. **145,578**, dated December 16, 1873; application filed December 2, 1873.

To all whom it may concern:

Be it known that I, SAMUEL FREDERICK LEACH, of Chelsea, Suffolk county, State of Massachusetts, have invented a new and Improved Double-Lever Hand-Press, of which the following is a specification:

This invention relates to that class of presses which are used for punching holes in steel, iron, and other metals; also for cutting saw-teeth; also for cutting out pieces of leather for boot and shoe soles and heels, and for pressing them into shape; and for numerous other purposes where great force is to be exerted by compact and powerful machinery. The object of my invention is sufficiently defined by the above explanation.

Figure 1 is a side view of my invention. Fig. 2 is a vertical section of the same.

The whole device is made of steel and iron, though I do not limit myself to these metals, or to any particular substance suiting the purpose.

In the drawings, A, Figs. 1 and 2, is a platform, which is supposed to be screwed to a bench or table. B is the standard, which is cast upon the platform, and is of the shape as seen in the drawing, and is solid at its lower portion, but in its upper half bears a perpendicular channel or groove, which effects the formation of two strong walls, of shape as seen in the drawing. C is the handle of my device, being the first of my pair of double levers. At its left-hand end it bears a cam, E, cast upon it, which cam passes into the groove mentioned, between the walls of the upper part of the standard B. At the point *c*^{*} a hinge-rivet passes horizontally through this cam and through the two walls of the standard, by which hinge-rivet the cam and handle are suspended. C^o is a loop of iron passing over the left-hand end of the handle C, and fastened by its lower ends, respectively, to the edge (the right-hand edge in the drawing) of the walls of the standard B. F is a curved slot cut in the lower portion of the cam, and bears a small steel roller, G, which roller is borne by a cylindrical horizontal projection from the upper end of the upper connector or loop, H, which is a strip of metal, oblong, with its ends rounded, passing perpendicularly down by the side of the cam (which cam is, at that point,

cut away to permit this) till it reaches across the side of my second lever, J, Fig. 2, (which lever lies between the walls of the upper part of the standard B,) to which lever this upper connector H is held by means of a hinge rivet or pin passing horizontally through both. (See Fig. 2.) Upon the left-hand end of the lever J, Fig. 2, the lower portion of the cam impinges. The right-hand end of this second lever J is borne by the pin or hinge-rivet R, which passes through it and the standard-walls. The lower edge of the lever J bears, at the point Z, a boss or curved swelling, and bears, also, just above this point, the lower connector or loop, L, (which is a strip of metal of the same shape and size as the upper connector H) at one side of the lever J, (which lever is cut away at the side to permit this,) and this loop L is hung by a rivet from the second lever J, and is connected, in the same manner, near its lower end, with the plunger M. This plunger M passes perpendicularly down through a portion of the standard B, (see drawings,) and has a cavity bored in its lower portion to hold the upper end of a male die, whose function of perforating, or cutting, or pressing is caused to be effected by the pulling down of the handle C. The plunger is provided with the set-screw P (common with all punch-plungers) to hold, by its stem, the male die in place. The female-die plate is placed beneath.

The right-hand end of the handle C is lifted to its highest point, being prevented from rising higher than it should by the loop C^o. A steel plate, say, is to be punched. It is placed in the female-die plate, (not seen,) and accurately adjusted and firmly held. The handle C is then brought down. The cam E is then partially rotated, and, the semi-rotation being completed, the left-hand end of the second lever J is found to be depressed, when the boss Z is also depressed. This action presses downward the plunger M with the male die which it bears. The steel plate under operation is then punched in the usual manner, and the plate is to be liberated. The handle C is then raised, when the roller G, rolling upon the lower side of the slot E, is, by means of the curved form of this slot, raised, which action raises also the upper connector or loop H, thus raising the second lever J and

the boss Z. (The roller G rises, it is to be observed, because the center from which the arc forming the lower side of the curved slot is described is not coincident with the center of the pin e^x , upon which the cam E moves.) This action also raises the lower connector or loop L, which lifts the plunger M and the male die, (not shown,) thus detaching the latter from the steel plate operated on, when the plate is removed, and my device is ready for another operation.

It is to be noticed that I use a boss of solid metal on my second lever J to communicate compressive action to my plunger and male die. Further, that I have a solid body of metal in my standard; and that, while the resistance of the substance operated on is encountered by masses of solid metal, the simple raising of the male die is all that I effect by means of my connecting-loops; and that the friction, otherwise consequent on the action of my primary moving lever, is obviated by my arrangement of the roller and the curved groove. It is to be noticed, also, that the boss

Z, on the second lever J, whose impact drives the plunger down, is between the fulcrum R and the point where the cam E strikes the lever J. I thus avoid a prejudicial trembling common with other presses in which the fulcrum of the second lever is differently located.

I sometimes use my device of the curved slot F, roller G, and loop H with a single lever, C, the cam E thus acting directly on the plunger.

I do not claim a double lever and plunger connected by loops to actuate a male die.

I claim—

The combination and arrangement of the standard B and platform A, the cam-lever C E, and the second lever J, with the connecting-loops H and L, and the plunger M, all when constructed and arranged substantially as described.

SAMUEL FREDERICK LEACH.

Witnesses:

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