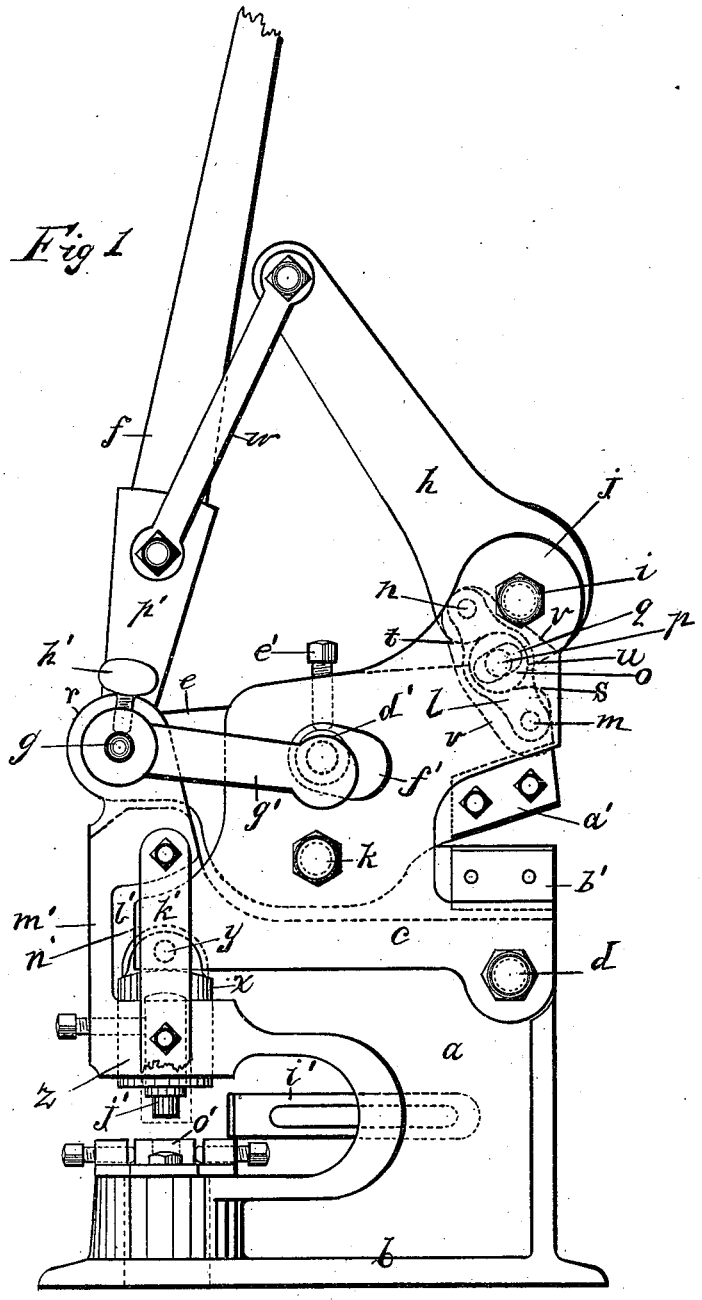
(No Model.) 3 Sheets—Sheet 1.

P. BROADBOOKS.

MECHANICAL MOVEMENT.

No. 303,416. Patented Aug. 12, 1884.

Fig 1



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ATTORNEYS.

(No Model.) 3 Sheets—Sheet 2.

P. BROADBOOKS.

MECHANICAL MOVEMENT.

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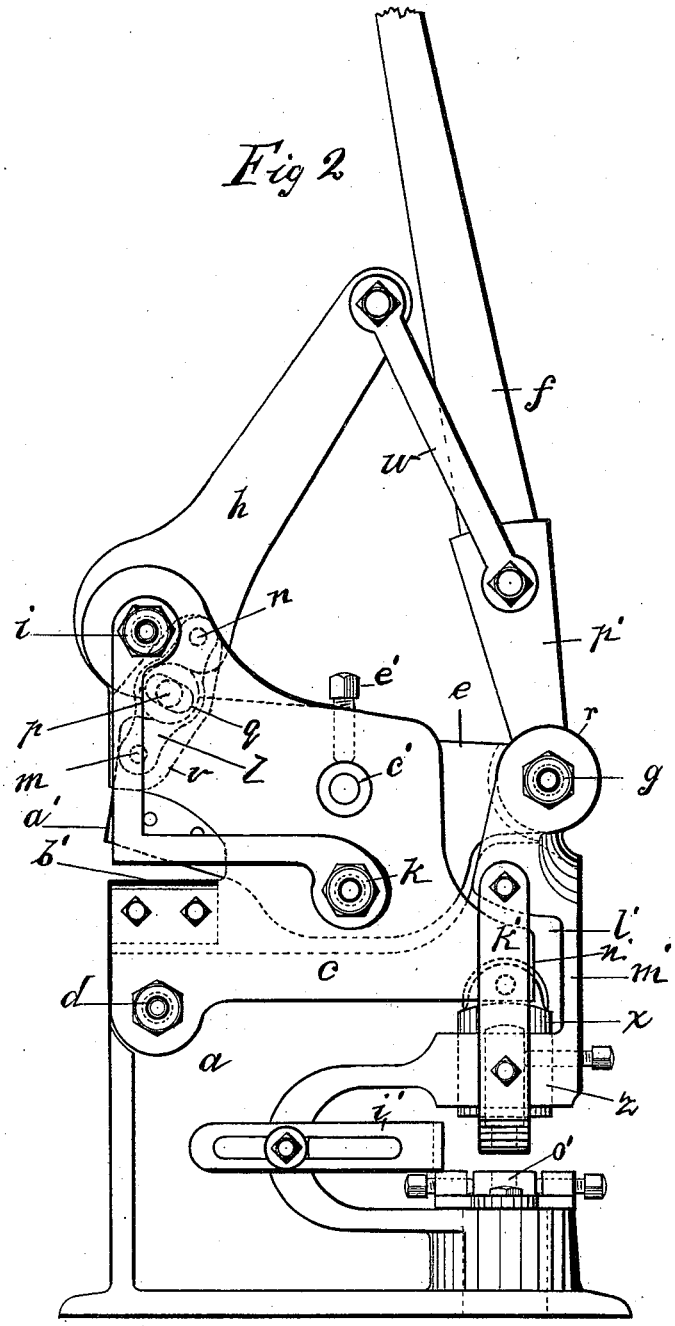
Fig 2.



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(No Model.) 3 Sheets—Sheet 3.

P. BROADBOOKS.

MECHANICAL MOVEMENT.

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Fig 3

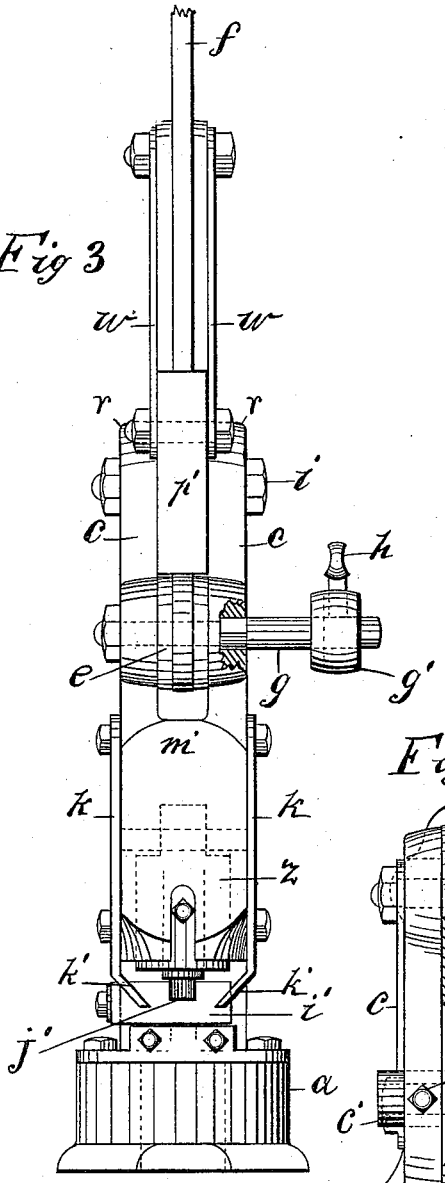


Fig 4

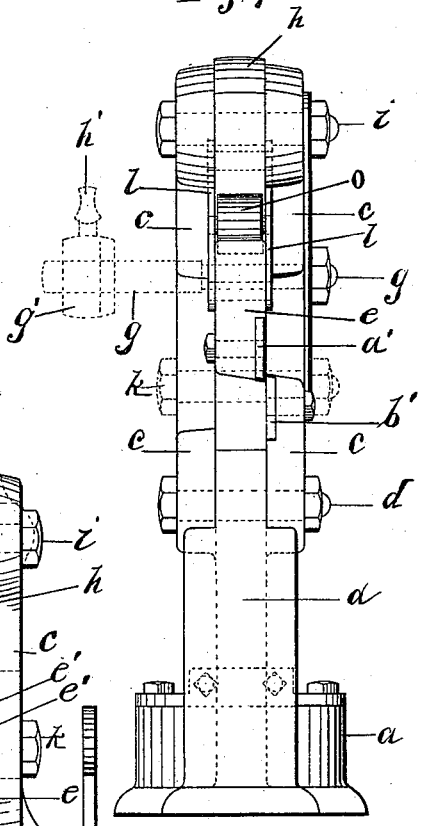
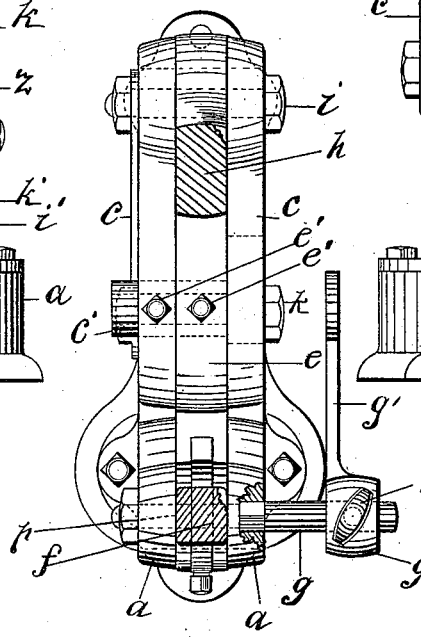


Fig 5



WITNESSES:

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UNITED STATES PATENT OFFICE.

PETER BROADBOOKS, OF BATAVIA, NEW YORK.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 303,416, dated August 12, 1884.

Application filed May 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, PETER BROADBOOKS, of Batavia, in the county of Genesee and State of New York, have invented a new and Improved Mechanical Movement, of which the following is a full, clear, and exact description.

My invention consists of improved contrivances of compound lever mechanisms for operating combined shearing and punching or other equivalent devices, the said improved contrivances being designed to provide more practical and efficient means of utilizing compound levers for working such devices, in an arrangement enabling the weight of the operating parts to serve in re-enforcement of the power of the operator applied to the working-lever to force the cutters, punches, or other devices down in the performance of their work, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improved machine. Fig. 2 is a side elevation in reverse of Fig. 1. Fig. 3 is a front elevation of the punching end of the machine. Fig. 4 is a front elevation of the shearing side. Fig. 5 is a top view with the working-levers cut off.

On the strong vertical extension-plate *a*, of a suitable base, *b*, I pivot a supporting-frame consisting of two strong plates, *c*, at *d*, near one end of said extension *a*, and on the other end of said vertical plate *a*, and at about double the height of pivot *d* from the base *b*, I also pivot a lever, *e*, and the working-lever *f* at the center *g* between two projecting arms, *r*, which extend vertically from said plate for receiving the pivot end of lever *e*. The said two plates *c* constituting the supporting-frame, are placed side by wide on the opposite sides of the upper edge of the plate *a* with the lever *e*, which consists of a wide plate between them above plate *a*, and with the cam-lever *h* forming the second lever, pivoted between them over lever *e* at *i*, where said frame-plates *c* have ears *j* extending above lever *e* for receiving the pivot end of the cam-lever. The lever *e* is also pivoted to these frame-plates at *k*, and at the end which is under the pivot end of cam-lever *h* said lever *e* is connected to the cam-lever by a pair of links, *l*, one on each side of said lever, and also of the cam-lever, and pivoted to lever *e* at *m*, and to the cam-lever at *n*. These links, which are for the purpose of raising lever *e* by the cam-lever when it is raised, I now propose to utilize also for the control of a friction-roller, *o*, fitted between the top of lever *e* and the cam-lever to diminish the friction of the pressure of the cam-lever *h* on lever *e*, by means of journals *p* on said roller, and slots *q* in the connecting-links, which guide the roller and keep it in position as it rolls forward along the incline *s* by the effect of the cam-projection *t* when lever *h* is forced down and backward along said incline by the effect of the projection *u* of the cam-lever when said lever is raised. The slots guide the roller by its journals so as to prevent the roller from turning sidewise and cramping or binding, and said slots may be fitted more accurately to the journals and to their line of travel than when made in the sides of frame-plates *c*, as they have been heretofore arranged. The frame-plates are recessed for reception of the connecting-links, as indicated by the dotted lines *v*. The lever *e* has a slot in the end that is mounted on the fulcrum-pivot *g*, in which the end of lever *f* fits like a rule-joint, to mount both levers on one fulcrum-pivot. The hand-lever *f* is connected a short distance above the fulcrum-pivot *g* to the free end of cam-lever *h* by the strap-links *w* for a powerful effect on lever *e*, which, besides being forced down by the cam-lever is also depressed by the weight of frame *c* or most of it which becomes suspended from said lever at *k* when lever *h* is being forced down so that frame *c* swings on its fulcrum-pivot *d*, and besides re enforcing the lever power by its weight, it becomes a working-arm for operating a sliding stock, *x*, for a punch or shear suspended from it at *y*, and fitted in a suitable guideway, *z*, of the plate *a*, to which the weight of said frame and also of levers *e* and *h* are added when the power is to be applied to it. Lever *e* has a shear-cutter, *a'*, attached to its end under the cam-lever *h*, and one of frame-plates *c* has the cutter *b'* for conjoint

action with cutter a', both of said plates being suitably notched for the arrangement of cutters adapted for cutting bar metal.

For a simple and efficient round-bar cutter attached to this machine I insert a cutter, c', in a hole through one of the plates c, and another cutter, d', in a corresponding hole through lever e at such distance above the pivot k as will give the necessary range of one cutter past the other by the vibration of the lever and plates c for effecting the cutting of the rods which are to be inserted through the cutter-holes, when the lever e and plates c are raised up, at which time the holes coincide with each other to allow the bars to be inserted; and for making the edges of these cutters more lasting I propose to construct them in the form of tubular dies and fit them in round holes, in which they can be turned readily to shift the cutting-points of the edges which are continuous around the bore, and enable the dies to be used much longer without regrinding than dies that cut at one place only. The said dies are secured in the plate c and lever e by set-screws e' that bind them fast in the holes. The plate c on the opposite side to the one having the cutter c' has a larger hole, f', through it than the die-hole of the other plate, to allow clearance for the lateral movements of the pieces cut off, and on the same side of the machine I arrange a gage-stop, g', by which to set the bars for the lengths to be cut off. This gage g' is mounted on an extension of the pivot-bolt, g, whereon it may be shifted along from one position to another according to the desired length of the pieces to be cut, and is fixed in position by the set-screw h'. I have also provided a back stop-gage, i', to the punch j' set in the sliding stock x, operated by the pivoted frame-plates c, also stripper-stops k'. These stripper-stops are arranged across the notches l' in the sides of the widened front end m', of the bed a in which the ends n' of the frame-plates c work, and serve to some extent for guides to control the frame-plates. In this case I have represented a punch, j', fitted to the sliding stock x with a corresponding punching-die, o', in the bed below; but I desire it to be understood that I may substitute cutters or any other form of devices adapted to be worked with a stationary bed and sliding stock.

The hand-lever is preferably made to consist of a wood bar, f, and a socket, p', to facilitate the packing of the machine for shipment by detaching the hand-bar from the socket for economy of space.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lever mechanism consisting of cam-lever h, having a fulcrum-pivot, i, and being connected by links l to the lever e to be worked by said cam-lever with an intermediate friction-roller, o, the said links l, having guide-slots q for the journals of the roller o, substantially as described.

2. The compound lever mechanism consisting of supporting frame-plates c, having a fulcrum-pivot, d, on the bed a, and pivoted at k to the lever e, having a fulcrum-pivot on the bed a at g, and having the cam-lever pivoted to it at i, said cam-lever being connected to the lever e, with an intermediate friction-roller, o, substantially as described.

3. In a compound lever mechanism, the hand-lever f, and the lever e, pivoted to the bed a on pivot g, in combination with cam-lever h and pivoted supporting-frame c, said frame and lever e being pivoted at k, and the cam-lever h pivoted to the supporting-frame c at i and connected to lever f by strap-links w, substantially as described.

4. In a compound lever mechanism consisting of jointed supporting-frame c, lever e, cam-lever h, and hand-lever f, arranged substantially as described, the lever e, having a cutter, a', in combination with a cutter, b', attached to one of said frame-plates, substantially as specified.

5. In a compound lever mechanism consisting of jointed supporting-frame c, lever e, cam-lever h, and hand-lever f, arranged substantially as described, the frame-plates c, having a sliding stock, x, attached to the frame-plates at the end opposite to the fulcrum-pivot d, substantially as specified.

6. The supporting frame-plates c, pivoted to the opposite sides of bed-plate a, and having the lever e and cam-lever h, arranged between and pivoted to them, and said plates having ends n' projecting into the notches l' of the front end of the bed-plate, with guide-bars k' to the sides of said plates, substantially as described.

PETER BROADBOOKS.

Witnesses:
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GEORGE P. THOMAS.