

T. P. AUSTIN.
Machines for Stamping Sheet Metal Ware.
 No. 135,750. Patented Feb. 11, 1873.

Fig. 1.

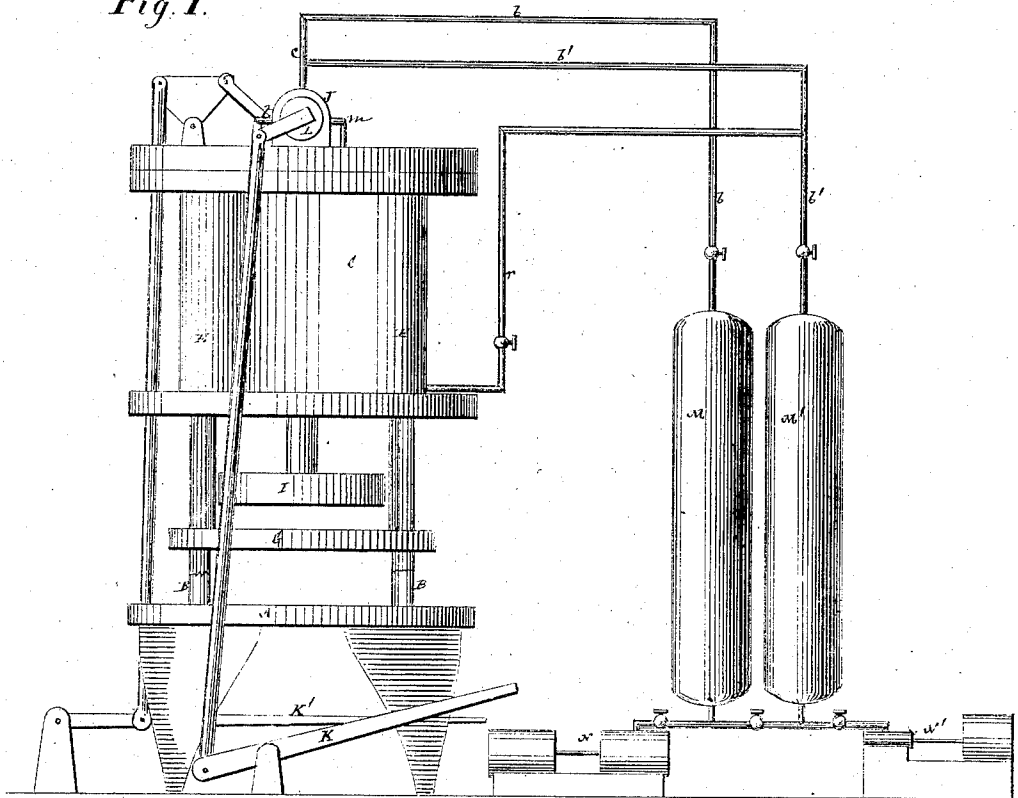


Fig. 2.

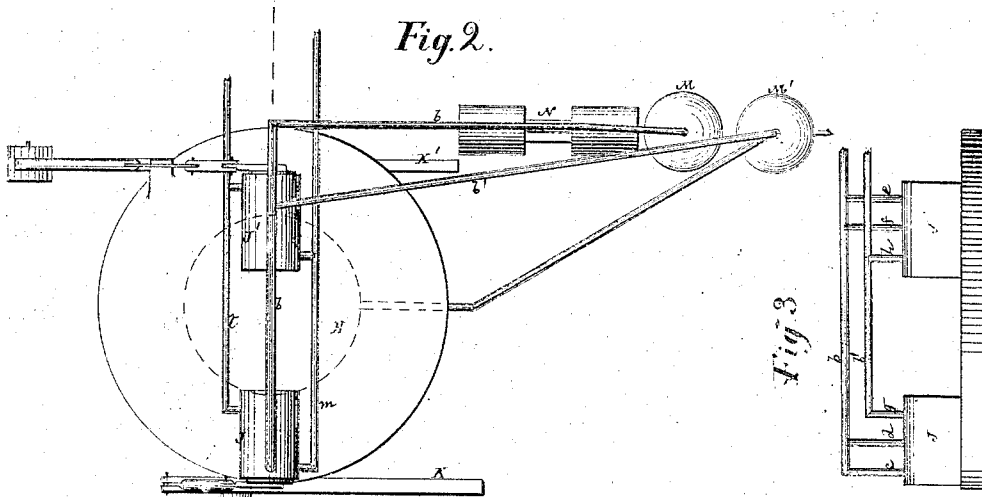
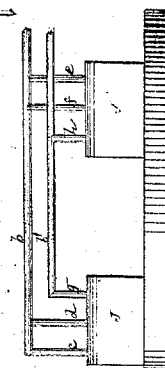


Fig. 3.



Witnesses:
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Fig. 4.

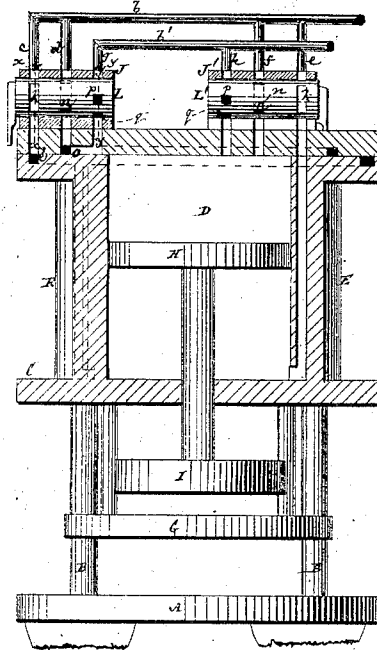


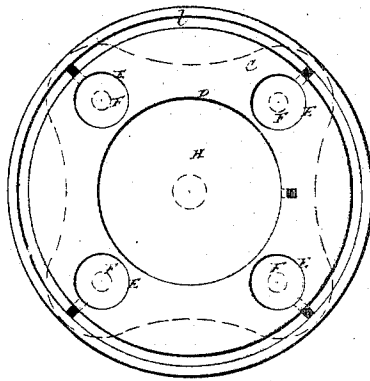
Fig. 5.



Fig. 6.



Fig. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

THEODORE P. AUSTIN, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR STAMPING SHEET-METAL WARE.

Specification forming part of Letters Patent No. 135,750, dated February 11, 1873.

To all whom it may concern:

Be it known that I, THEODORE P. AUSTIN, of the city, county, and State of New York, have invented a new and useful Improvement in Machines for Stamping Sheet-Metal Ware; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a side elevation of a machine or apparatus having my invention applied; Fig. 2, a plan of the same; Fig. 3, an end view of the cylinder-cover with valve-chests thereon; Fig. 4, a vertical section of the apparatus in part; Figs. 5 and 6, transverse sections at the lines *xx* and *yy*, respectively, of the valves used in the apparatus; and Fig. 7, a plan of the main casting containing the cylinders with the cover thereof removed.

Similar letters of reference indicate corresponding parts.

This invention relates to the press or apparatus for stamping sheet-metal ware, for which reissued Letters Patent No. 4,765 were granted to William D. Grimshaw and others February 20, 1872, (date of original patent being December 1, 1868,) and in which the sheet-metal plate to be stamped or worked is placed upon a die, and a holding-block carried by a number of pistons is brought down to bear on the margin of the plate outside of and around the hollow of the die. The plate, thus held, is then subjected to the action of a stamp operated by a central or main piston, and arranged to work through the holding-block, to press the portion of the sheet-metal plate lying over the hollow of the die into the latter. The several pistons were operated by any suitable fluid, but preferably water under pressure of compressed air in a receiver or reservoir, the operating fluid being admitted into the cylinders containing the pistons on opposite sides of the latter, and exhausted therefrom, as required, accordingly as the pistons were to be raised or lowered, by means of valves operated by treadles, and controlling passages in the top plate of the press, and passages connected therewith in communication with the ends of the cylinders. The improvement consists in means for operating the press under high and

low pressures at different points in the stroke of the pistons, and whereby a low-pressure fluid may be mainly used for bringing the holding-block and stamp down to their work and back again, and a high-pressure fluid be employed for giving the final holding-and-pressing action to the pistons, and, if desired, for starting the stamping-piston back again, thus economizing the use of a high-pressure fluid in the cylinders, and reducing the cost of working the press accordingly.

A is the bed or table of the press, designed to hold or contain the die on which the plate to be worked is placed. B B are pillars, arranged to support the casting C, in which are the main or central cylinder D, and the surrounding smaller cylinders E E, the latter receiving the pistons F F which carry the holding-down block G, and the former cylinder D having a piston, H, within it for operating the stamp I, which passes through the holding-down block or ring. J J' are the valve-boxes or cases containing the valves for controlling the action of the pistons F F and the piston H, respectively, by means of treadles K K', as hereinbefore described. The one, L, of these valves serves to control the pistons F F, and the other valve, L', the piston H, by admitting and exhausting the operating fluid to and from passages in communication with the opposite ends of the cylinders D and E, respectively, as hereinbefore specified; but these valves L L' should each be so constructed as to control the admission of fluid of different pressures to the cylinders D and E E, as required. To this end they may be variously constructed, and be either cylindrical valves vibrating around a longitudinal axis, or slide-valves, as desired; but the former construction is here shown. M is the low-pressure reservoir, into which water is forced by a steam-pump, N, and M' the high-pressure reservoir having water forced into it by a steam-pump, N'. Passing down through the tops of these reservoirs to nearly the bottom of the latter are pipes b b', by which the water, subject to the action of the compressed air within the upper portions of the reservoirs, is supplied to the press on suitably operating the valves L L'. The low-pressure supply-pipe b' is connected with the valve-box J by pipes or branches c d, and with the valve-box J' by pipes or branches e f. The high-

pressure supply-pipe *b'* is also connected with the valve-box *J* by a branch, *g*, and with the valve-box *J'* by a branch, *h*. The valve *L* is constructed near its outer end with a cross-passage, *i*, and exhaust-cavity, *k*, the passage *i* serving, when the valve is suitably turned, to pass fluid of a low pressure from the branch *c* into an annular passage, *l*, and from thence to the cylinders *E E* onto the under side of the pistons *F F*, to raise said pistons and holding-down block *G*, carried by them; and the exhaust-cavity *k*, serving to pass water from beneath said pistons into an outlet-pipe, *m*, when it is required to lower the pistons. A central or intermediate cross-passage, *n*, in said valve *L* serves to pass water of a low pressure entering by the branch *d* into an annular passage, *o*, which communicates with the upper ends of the cylinders *E E*, and an inner-end cross-passage, *p*, and exhaust-cavity *q*, answer to pass water of a high pressure entering by the branch *g* to the top of the small pistons *F F* by the annular cavity *o*. The water is exhausted from the tops of the small pistons by the exhaust-cavity *q* and outlet-pipe *t* when it is required to raise the pistons. A similar arrangement of passages and cavities in the valve *L'*, and which are referred to by similar letters, serves, in connection with the branches *e f h* and outlet-pipes *m* and *t*, to admit successively, as required, water of a low pressure and high pressure to the top of the large piston *D*, or water of a low pressure to the bottom thereof, and to exhaust from either end of said piston's cylinder, as required, and accordingly as the valve *L'* is turned. The supply-pipes *b b'* are fitted with cocks for turning on and off the water from the high and low pressure reservoirs. The normal position of the treadles *K K'* is up, and when not depressed, and the cocks in the supply-pipes *b b'* are open, then water of a low pressure from the reservoir *M* is admitted by the passages *i'* in the valves *L L'* below the pistons *F* and *H*, to raise them, the exhaust-cavities *q* being open to the upper sides of said pistons. Upon slightly depressing, however, the treadle *K* the valve *L* is turned so as to open the exhaust *k* to the bottoms of the cylinders *E E* and outlet-pipe *m*, and at the same time to open the passage *n* to the branch *d* and top of the cylinders *E E*, thereby bringing down the pistons *F F* and work-clamping ring or block *G*, by water at a low pressure from the reservoir *M*. A further depression of such treadle *K* closes this low-pressure supply, and turns the valve *L* so as

to open the passage *q* to the branch *g* and tops of the cylinders *E E*, thus giving the final lowering or clamping action to the holding-down block *G* under or by water at a high pressure from the reservoir *M'*. The treadle *K'* is then similarly depressed at intervals to operate the valve *L'*, and cause it, by its passages and cavities, to first clear the cylinder *D* below the piston *H* of water; also, to introduce above said piston water of a low pressure from the reservoir *M*, and next, or by the concluding depressing action on the treadle, to admit water of a high pressure from the reservoir *M'* to finish the descent of the piston *H* and stamp *I*, and to give the latter its stamping action on the plate or sheet being worked. Upon removing the foot from either treadle *K K'* the valves *L L'* resume their normal position, exhausting the water from above the pistons *F* and *H*, and admitting water from the reservoir *M* of a low pressure below them to lift the block *G* and stamp *I* from the work. Should there be any tendency of the stamp *I* to stick when it should rise, then I open a cock in a pipe, *r*, that connects with the pipe *b'*, to introduce a small supply of high-pressure fluid, but after the stamp is released or started then said cock is immediately closed again.

From this description it will be seen that while a powerful action is obtained both for the clamping-block *G* and stamp *I*, when in contact with the work, by then using fluid of a high pressure, but little of such high pressure fluid is used in the working of the press, inasmuch as the general or main action of the pistons *F* and *H*, both in rising and falling, is controlled by fluid of a low pressure, and which is produced at a much less cost than fluid at a high pressure.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of the high and low pressure fluid-reservoirs *M M'* and valves *L L'* with the cylinders *D E*, the pistons *F H*, the holding-down block or ring *G*, the stamp *I*, and treadles *K K'*, when said valves are constructed and connected with both reservoirs for successive supply of the fluid at different pressures during the motion of the pistons, substantially as specified.

THEO. P. AUSTIN.

Witnesses:

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