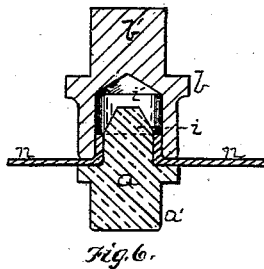
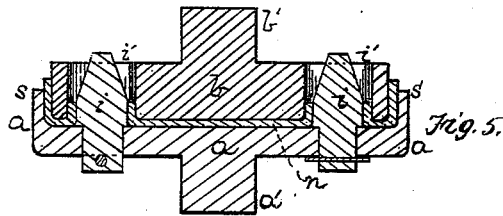
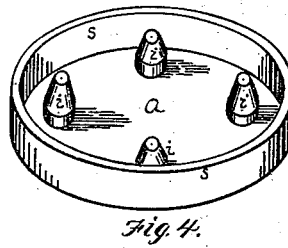
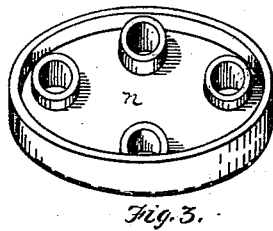
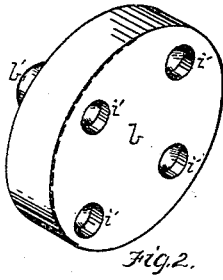
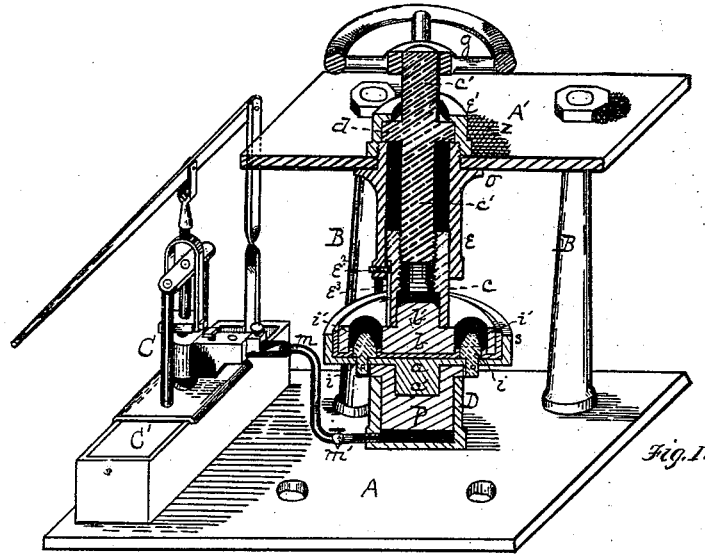


D. MORGAN & W. GODLEY.

FLANGING-MACHINE.

No. 192,448.

Patented June 26, 1877.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN FLANGING-MACHINES.

Specification forming part of Letters Patent No. 192,418, dated June 26, 1877; application filed May 17, 1877.

*To all whom it may concern:*

Be it known that we, DAVID MORGAN and WILLIAM GODLEY, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful improvement in Flanging-Machines; and we do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view, partly in section, of our improved flanging-machine. Figs. 2 and 4 are perspective views of the upper and lower flanging-dies. Fig. 3 is a like view of a flanged boiler-head, pressed upon such dies. Fig. 5 is a sectional view of these dies, with the flanged head between them; and Fig. 6 is a like view of a modified form of dies for flanging or nozzling a single flue-opening.

Our present improvement relates to apparatus for flanging boiler-heads and other like articles by means of pressure-dies, actuated by hydraulic or other fluid pressure.

A represents the bed-plate, and A' the upper plate, the two being firmly connected by posts B in any desired number for giving requisite strength, and the whole constituting a frame-work, which may be supported in any suitable way. C represents an ordinary hydraulic force-pump or accumulator, or steam or other suitable fluid-pressure engine, connecting with the cylinder D by means of a pipe, *m*. P is a piston or plunger working in the cylinder D, which may be packed in the usual way to prevent leaking. The lower die *a* rests upon the top of the piston P, the lug or pin *a'* fitting into a socket in the piston, as shown in Fig. 1. This lower die *a* has studs *i*, in any desired number, projecting up from the bottom of the die, by preference, a little above the level of the outer rim or flange *s*. These studs are for flanging or nozzling flue-holes and other like work. They are made conical at the point, so as to enter the punched hole in the metal plate *n*, and turn up the edges of the same, when the plate is forced into the dies, as shown in section, Figs. 5 and 6. The flange *s* on this die *a* operates to turn up the edge of the metal plate *n* around the

outer periphery or face of the die *b*, when the two dies are forced together, as hereinafter described.

The upper die *b* has holes *v'* corresponding to the studs *i*, these holes being large enough to admit the studs, plus the thickness of the flange formed between the two. The whole diameter of the upper die *b* is equal to the internal diameter of the flanged head, so that the dies and head may fit together, as shown in section, Figs. 1 and 5. The upper die *b* has a lug or pin, *b'*, fitting into a socket in the end of the pressure-block *c*, as shown in Fig. 1. This pressure-block *c* slides within the sleeve *e*, and is kept from turning by a key, *e<sup>2</sup>*, and groove *e<sup>3</sup>*. A shaft or stem, *e'*, held in place within the sleeve *e* by collar *d*, or in any convenient way, works by a screw-thread in the block *c*, so that by turning the stem *e'* by the hand-wheel *g*, or otherwise, the block *c* will be raised or lowered. The collar *d* holds the block *c* and stem *e'* in place, as against pressure from below, and should be made strong for this purpose; also, the sleeve *e* should be securely attached to the upper plate A'. This may be accomplished by making a flange or collar, *o*, on the sleeve, which rests against the under side of the plate, and passing the end of the sleeve up through the plate, and screwing the nut *e<sup>1</sup>* thereon. Any known means of attachment may be used, however, provided only sufficient strength be secured.

Fig. 6 shows a modification of the dies, used for flanging or nozzling a single flue-hole, the lower die *a* having a single stud, *i*, and the upper die *b* having a single recess or opening, *v'*, into which the stud enters. Many like modifications may be made in the dies employed, adapting them to special forms of work; but such modifications we consider as coming within our invention.

In operation, the lower die *a* may be put in place, and a plate of metal, *n*, being properly shaped, punched, and heated, placed thereon, with the conical points of the studs *i* entering the punched holes. The upper die *b* is then put in place, so that the studs *i* may enter the holes *v'*. The pressure-block *c* being properly adjusted the apparatus will be ready for operation. By forcing water or steam into

the cylinder D the piston P will be forced upward, and the upper die resting against the block *c*, the two dies will be forced together, which will cause the plate *n* about the edges of the punched holes to be turned and drawn up about the sides of the studs *i*, and the outer edge of the plate *n* will be turned up and shaped to a flange between the outer face of the die *b*, and the inner face of the flange *s* on the die *a*, as shown in Fig. 3. In order to release the flanged article from the dies the water or steam may be drawn off from the cylinder D through the waste-port *m'*, or if water be used it may be pumped back into the tank *C'*, and used in a subsequent operation. The cylinder being thus emptied the piston P will return to its first position, and by raising the pressure-block *c* by means of the stem *c'*, space will be afforded for removing the dies, and taking the flanged article therefrom.

An advantage of very great importance attending the use of our apparatus is the fact that by it boiler-heads and other like articles having any number of flue-openings may be flanged at a single heat, and by a single operation, while by methods formerly in use the plate or boiler-head to be flanged must be

given a separate heat for every flue-opening flanged or nozzled, which not only adds materially to the time and expense of the operation; but the article itself is often seriously injured by such repeated-heating, the excess of scale formed thereby weakening the iron.

We claim herein as our invention—

1. In a flanging-machine, the combination of two flanging dies, *a b*, piston P, cylinder D, adjustable block *c*, stem *c'*, and sleeve *e*, substantially as described.

2. The combination of pressure-block *c*, piston P, and two flanging-dies, having one or more studs, *i*, and recesses or holes *i'*, substantially as described.

3. In a flanging-machine, the combination of two flanging-dies, one having one or more studs, *i*, and a flange, *s*, the other having one or more recesses or holes *i'*, substantially as set forth.

In testimony whereof we have hereunto set our hands.

DAVID MORGAN.  
WILLIAM GODLEY.

Witnesses:

ISAAC H. ROSS,  
JOHN FITZSIMMONS.