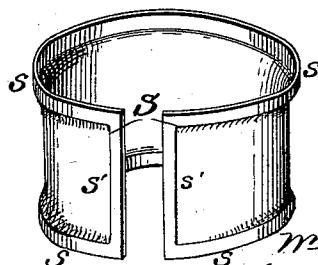
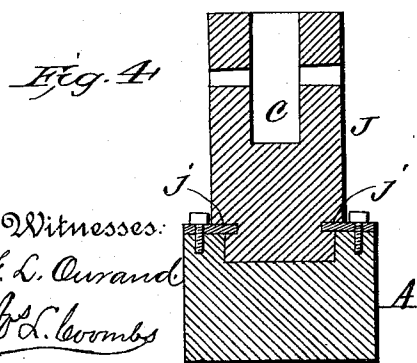
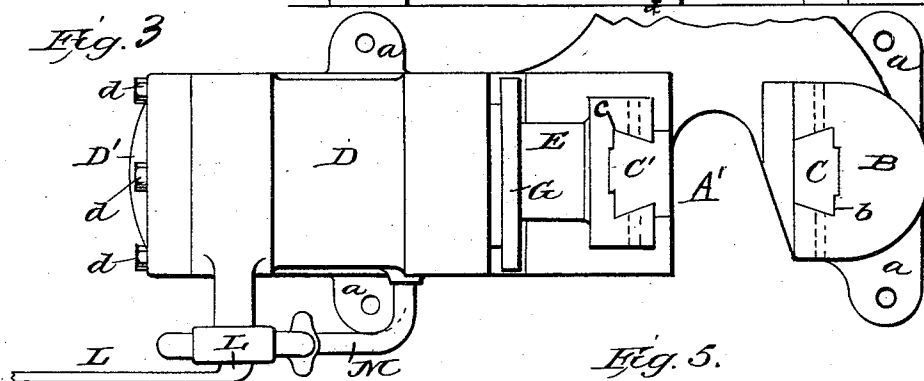
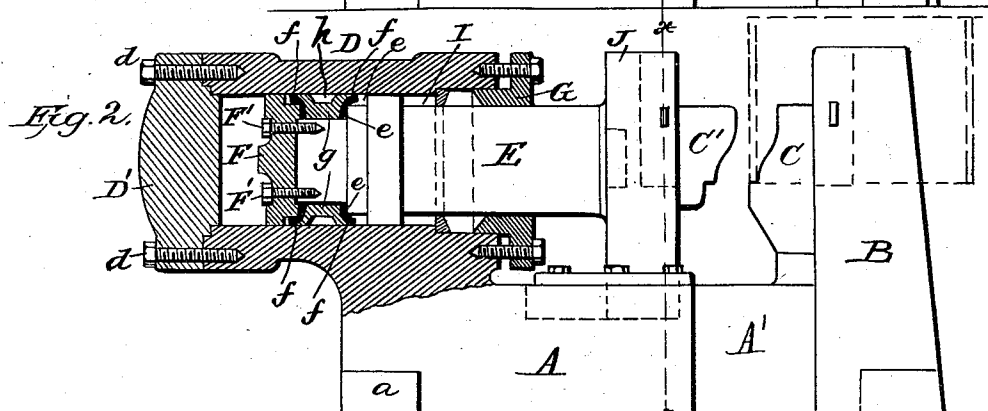
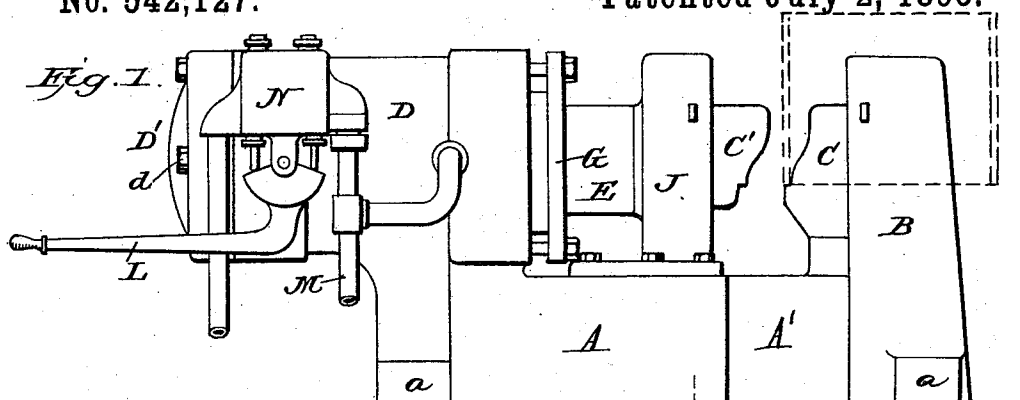


(No Model.)

W. H. WOOD.
CIRCULAR FLANGING MACHINE.

No. 542,127.

Patented July 2, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. WOOD, OF MEDIA, PENNSYLVANIA.

CIRCULAR-FLANGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,127, dated July 2, 1895.

Application filed March 21, 1895, Serial No. 542,671. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WOOD, a subject of the Queen of Great Britain, and a resident of Media, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Circular-Flanging Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation of my hydraulic flanging-machine. Fig. 2 is a longitudinal sectional view of the same on a vertical plane through the middle of the cylinder and plunger. Fig. 3 is a plan or top view of the machine. Fig. 4 is a transverse sectional view on the vertical plane indicated by the broken line marked *xx* in Fig. 2, and Fig. 5 is a view of a boiler-shell as it appears after flanging by my machine.

Like letters of reference designate corresponding parts in all the figures.

My invention has for its object to overcome the difficulties attending the flanging of boiler-shells after they have been rolled by constructing a hydraulic flanging-machine adapted to that particular kind of work; but while my hydraulic flanging-machine is principally intended for flanging boiler-shells in such a manner that it will put ogees on the two sides of the shell after it has been rolled, as well as at the top and bottom parts of the circle formed by the rolling process, it is equally well adapted for flanging the enlarged parts of the shells which join up to the fire-boxes of horizontal portable boilers, or it can be used for flanging the water-bottoms of portable boilers, for upsetting bolt ends, bending angle-iron rings, and, in short, for doing a large variety of structural metal-work adapted to be accomplished by hydraulic power.

My invention therefore consists in the construction and combination of parts of a hydraulic flanging-machine adapted for circular, plain, or ogee flanging, as will be hereinafter more fully described and claimed.

On the accompanying drawings the reference-letter A denotes the bed or base of the ma-

chine, which is cast very heavy and solid and provided with perforated ears *a a*, whereby it may be firmly bolted to its foundation. At one end of this solid base A and cast in one piece with it is a post or stake B, which has a dovetailed seat or recess *b* on the side facing the cylinder D for the insertion, removably, of the die C, whereby, in conjunction with the movable counter-die C', the ogee is formed on the shell, (shown at S,) which is suspended during the process of flanging the circular ends over the stake B, as illustrated in Fig. 1, the shell being reversed after the flange has been put on at one end for similarly flanging the other end. Opposite and in alignment with the dies C and C' is the hydraulic cylinder D, formed integral with or securely bolted to the bed or base A and having a removable head D', held in place by means of bolts *d d*. Inside of this cylinder works the cylindrical plunger or follower E, the open rear end of which is closed by a removable follower-head F, secured thereto by means of bolts F'. The rear end of the plunger is formed with two annular grooves or recesses *ee*, which, in connection with the head F, form peripheral recesses or seats for leather cup-washers *ff* and for a brass sleeve *g*, which is formed with a peripheral recess or groove *h*. This sleeve separates the cup-washers, and by tightening the bolts F' any wear of the washers may be taken up, forming a water-tight fit of the follower or plunger within the cylinder. The cylinder at its front end is provided with a gland G, through which the end of the plunger works, this end being reduced so as to form an annulus I between the cup-shaped packing-rings and the gland. The forward end of this plunger or follower is provided with a driving-head J. The lower end of this driving-head slides in parallel guides *j j*, bolted upon the bed of the machine, while its forward end, opposite to and in alignment with the die-seat *b* in stake B, is also provided with a dovetailed die-seat or recess *c* for the insertion of the removable counter-die C', which is keyed in its seat, so as to register or coincide exactly with the opposite die C.

The backward motion or return stroke of plunger E, with its driving-head J and die C', is effected by the differential area of pressure directly from the pressure-pipe M, while the

forward motion of the plunger and parts moving with it is caused and controlled by a pressure-valve connecting directly with the pressure-valve N, which has also a discharge-valve, so that all that is necessary to start the machine is to open valve N by means of the working-lever L, which starts the plunger on its forward stroke. The moment this lever is released the differential area of pressure at the forward end of the follower E, which is in direct communication with the pressure-pipe M, opening into the cylinder D at this point, will cause the plunger to start on its return stroke, and so on, the forward and backward motions of the follower or plunger, with the parts attached to and moving with it, being controlled and regulated by means of the working-lever L. In other respects the hydraulic connections for the admission to the working-cylinder of water under pressure from the accumulator and for effecting the discharge from the cylinder prior to the back or return stroke of the plunger do not differ from those of other direct-acting hydraulic machines of the same general type, although I prefer to use in this connection the improved pressure-reducing valve invented by me, and for which Letters Patent of the United States, No. 512,145, were granted to me on the 2d day of January, 1894.

It will be seen that by means of the corresponding or registering die-seats *b* and *c* dies or "formers" of various patterns may be used, according to the precise nature and character of the work to be done by the machine, the dies shown in Fig. 1 being of the shape required to put an "ogee" on the boiler-shell shown in position for receiving the same. By the cutting out of the bed or base A on one side, as shown at A', the boiler-shell S, or structures of similar shape, may be so adjusted upon the stake B and its die C that both edges *s' s'*, as well as the circular top and bottom *s s*, may be flanged, viz: To flange or shape the parallel sides *s' s'*, the shell is sprung over the top of the stake, as indicated in dotted lines, at the same time changing the position of the dies or formers C C' to one at right angles to that shown on the drawings. As the machine and its formers may be adjusted to suit any radius of shell, and to

make vertical and horizontal flanges with the same ease, it will be readily perceived that it covers a wide field of usefulness, the particular details of which will readily suggest themselves to the practical workman having experience with this line of work. For example, this machine can be used for bending angle-iron rings of any diameters by means of sectional formers. In forming ogees the shell must be first heated on a circular hearth, where it is desired to put on the ogee, and then suspended by a little jib-crane, so as to be easily swung over the stake of the machine, and thus bring both formers into their proper co-operative position. In this manner I have been able, by actual and accurately-timed tests, to put an ogee on a sixty-inch shell or circle in from fifteen to sixteen minutes, while by manual labor only it would take two or three skilled workmen nearly three-quarters of a day's time and labor to do precisely the same thing, which would then result in a job inferior to that done by my machine. This is merely an illustration of what can be actually accomplished by this machine in putting ogees on rolled shells by means of sectional formers.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

A hydraulic flanging-machine comprising the working-cylinder D having a removable head D' and provided with the plunger E having removable head F, grooved sleeve *g*, and cup-washers *ff* on opposite sides thereof, in combination with the laterally-recessed bed or base A, stationary stake B having die-seat *b*, and driving-head J attached to the outer end of the plunger, sliding in grooved ways, *jj*, in the base, and provided with a die-seat, *c*, coinciding with the die-seat in stake B; substantially as and for the purpose herein shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM H. WOOD.

Witnesses:

M. BROOKE WILLIAMSON,
JNO. M. BROOMALL, 3d.