

Seth Bowen. Machine for Flanging Sheet Metal for Boiler Heads, &c.

Sheet 1.

117091

PATENTED JUL 18 1871

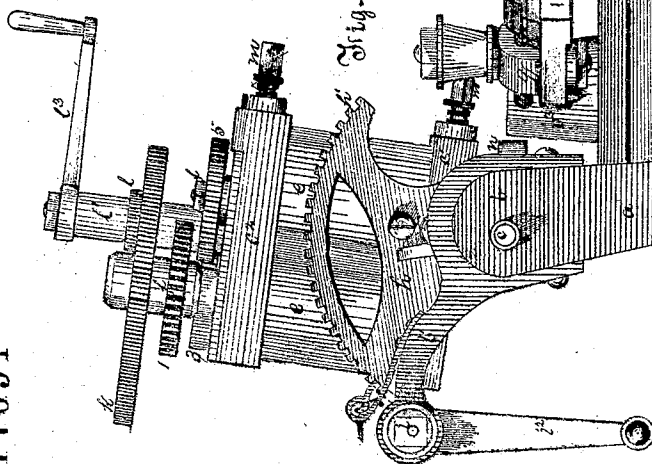
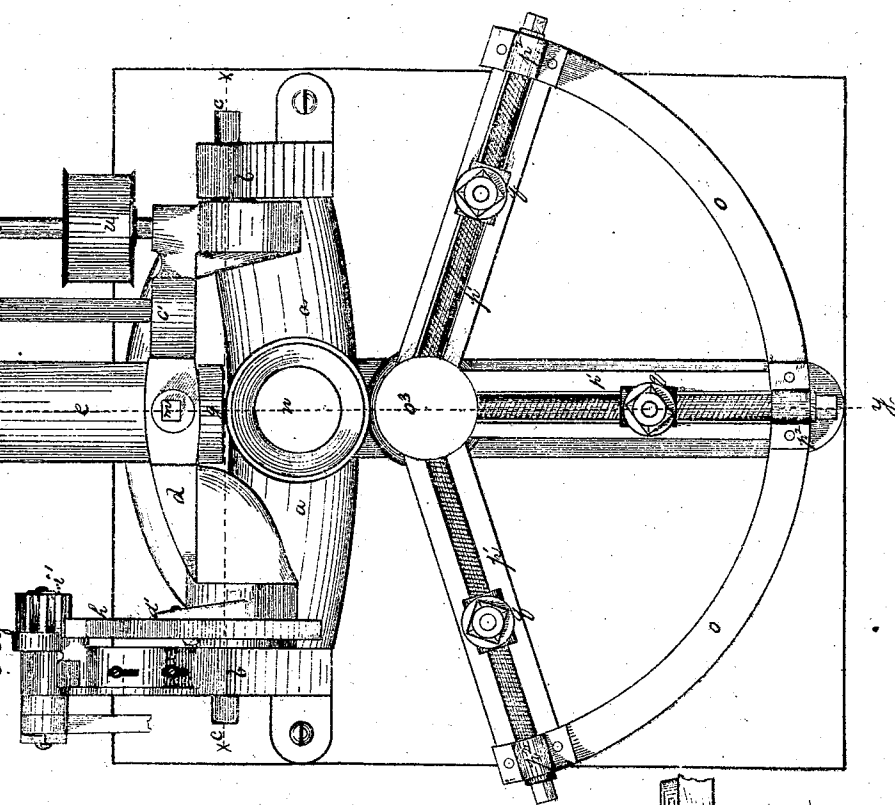


Fig. 1.

Fig. 2.



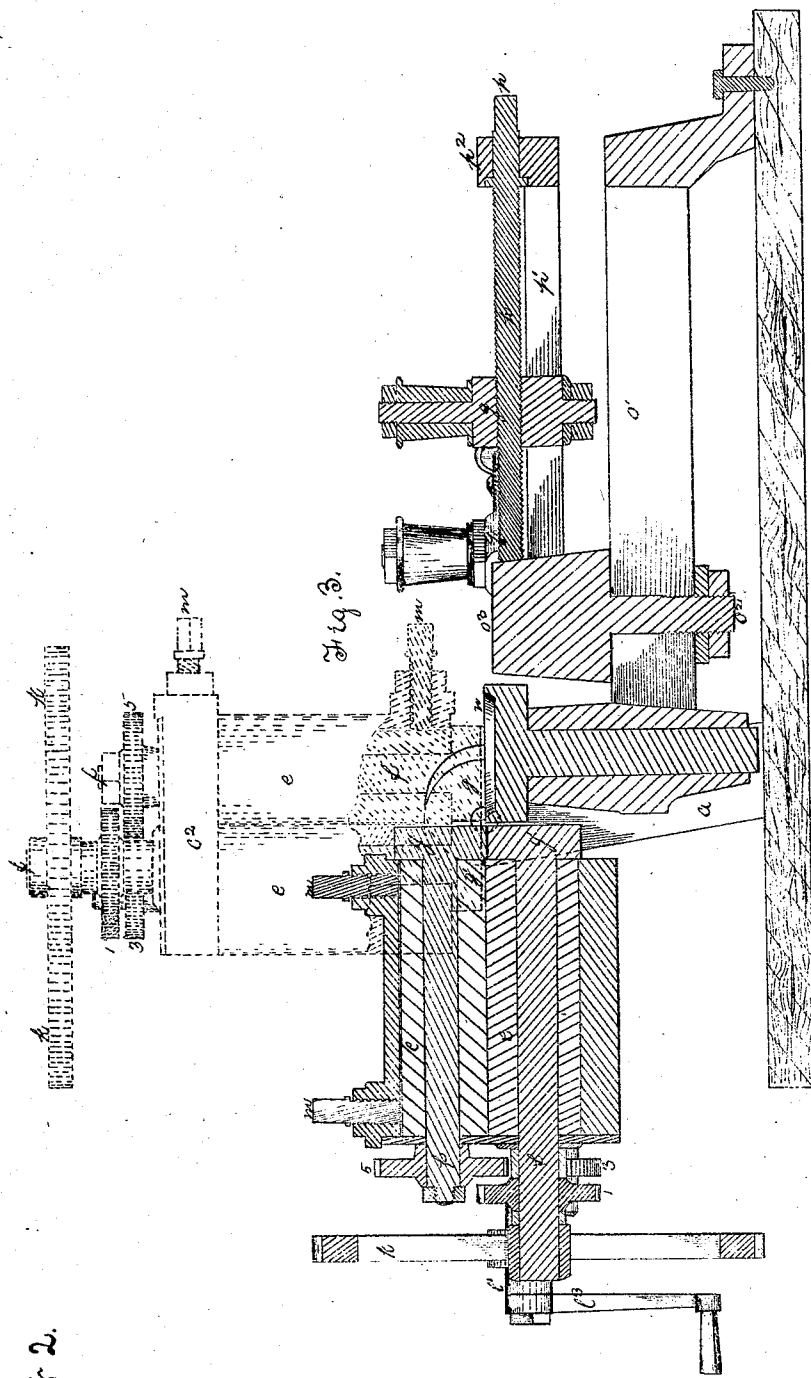
Witnesses
R. H. Henshall
James S. Kay.

Inventor

Seth Bowen
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Seth Lowen. Machine for Flanging Sheet Metal for Boiler Stovepipes, etc.

Sheet 2.



Witnesses
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UNITED STATES PATENT OFFICE.

SETH LOWEN, OF TEMPERANCEVILLE, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR FLANGING BOILER-HEADS.

Specification forming part of Letters Patent No. 117,091, dated July 18, 1871.

To all whom it may concern:

Be it known that I, SETH LOWEN, of Temperanceville, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machine for Flanging Sheet Metal for Boiler-Heads, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side elevation of my improved flanging-machine, showing the devices for operating the mandrels for bending up the flange. Fig. 2 is a plan view of the same with the mandrels thrown back to permit the insertion of the sheet of metal to be flanged; and Fig. 3 is a sectional view of the same through *y y*, Fig. 2, showing in dotted lines the position of the bending-mandrels when the operation of bending up the flange is completed.

Like letters of reference indicate like parts in each.

My invention relates to that class of machines used for flanging boiler-heads, and of circular and oval plates of sheet-iron, copper, tin, &c., used in the construction of circular and oval-shaped vessels, as pans, kettles, &c.; and it consists in the construction and arrangement of a pair of revolving dies or mandrels, which operate, by means of devices hereinafter described, in such a manner as to make a straight flange around the edge of a circular sheet of metal placed between them.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation.

The frame *a*, which is made of iron or other suitable material, has an upright or bearing, *b*, at each end for supporting the journals *c c*, the inner ends of which sustain the revolving arch or bow *d*. The arch *d* is of irregular shape, and carries a frame which is composed of the plates *c¹ c²* and the cylindrical boxes *e e*, shown in the figure. Running down through each cylinder *e e* is a stem, *f*, the upper ends of which project above the cylinders and the lower ends project below, each one carrying a circular mandrel or die, *g*. The part *d* is made arched so that the mandrels *g g'* shall project just to the axial line *x x* of the revolving arch *d*, such line running through the journals *c c* upon which the arch

turns, and between the lower adjacent edges of the mandrels *g g'*. Rigidly attached to an upward projection, *d'*, on one end of the arch *d*, so that it will revolve along with it, is a segmental gear-wheel, *h*, having teeth *h'* at its circumference. To the bearing *b* is fastened an arm, *b'*, which extends obliquely backward and upward, parallel with the segmental wheel *h*, a little beyond its outer edge or circumference *h'*. In the outer end of the arm *b'* is a hole or eye, through which is a small shaft, *i*, carrying on its inner end a small gear-wheel, *i¹*, the teeth of which gear into the teeth of the segmental wheel *h*. To the outer end of the shaft *i* is attached a crank, *i²*, which, when turned, operates the segmental wheel. As the segmental wheel *h* is rigidly attached to the arch *d* they both turn on the journals *c* the length of the circumference of the segmental wheel, which is equal to the quadrant or one-fourth of a circle, the center of which is the axial line *x x*. On the upper ends of the shafts *f f*, and rigidly attached thereto, are the gear-wheels 1 and 5. One of the shafts *f* extends above its connection with the wheel 1, and there carries the large gear-wheel *k*, which gears into a small wheel, *l*, on a perpendicular shaft, *l'*, at the side of the frame, such shaft being supported by the lug or bearing *l²* extending out from the side of the plate *c²*, and operated by the crank *l³*. The gear-wheels 2, 3, and 4 are merely multiplying-wheels for connecting the wheel 5 which operates the mandrel *g* with the wheel 1 which operates the other mandrel *g'*. The wheels 1 and 5 are of the same size, and operated with the same degree of velocity. The mandrels *g g'* are operated by power applied to the shaft either by the crank *l³*, or by a belt passing around the wheel *u*, or through the gear-wheels 1 and 5 and shafts *f f*. The mandrels *g g'* are adjustable in the boxes *e e* by means of the screws *m m*, so that they may be set to the thickness of the sheet of metal to be flanged. Rigidly attached to the frame *a* directly in front of the mandrels *g g'*, and standing flush with the axial line *x x*, is the guide-plate *n* for supporting and holding the sheet of metal up against the mandrels *g g'* when they are operating upon it. In front of this plate is a semicircular table, *o*, for carrying the sheet of metal, adjustable on the ways *o¹* by means of the clamp *o²*. On the upper face of this table are three threaded rods *p*, converging to the center of the table, which is

the point nearest to or directly in front of the platen, where their inner ends are sunk in loosely, so as to allow them to revolve therein, into holes or notches in the block o^3 . The outer ends of the rods are held in place by and operate in the journal-boxes $p^2 p^2$ on the outer edge of the table o . On each rod p is a tapped-and-threaded nut, q , supported on the radiuses or ways p^1 , which run along just under the rod. By turning the rods p by means of a wrench applied at the outer ends, which are suitably shaped for that purpose, the nuts q are operated forward and backward along the stems p at pleasure. These nuts act as holders to hold the sheet of metal in place and keep it from slipping when being flanged, the nuts being turned up to follow the sheet as its diameter diminishes by the bending up of the flange.

The operation of my machine is as follows: The arch d being thrown back to the position shown in Fig. 2, plate 1, a circular sheet of brass, iron, or other metal is placed upon the guide n and table o with the edge inserted in between the two mandrels $g g'$, and the nuts q screwed up until they come against the sheet for the purpose of holding it up to the mandrels, the rotary motion of the latter having a tendency to throw it out sidewise, and by the radial motion a tendency to push it forward away from them. The crank l^1 is then operated rapidly, giving a quick revolving motion to the mandrels $g g'$, and causing the sheet of metal to be spun around between them. The crank i^2 is then operated slowly, which causes the arch d to rise gradually, describing the arc of a circle around the axial line xx as a center, and the mandrels $g g'$ to occupy a position in a plane which cuts the plane of their former position at right angles. By this second motion, which is simultaneous with the first, the edge of the sheet which is being spun around between

the revolving dies or mandrels $g g'$ is gradually bent up until at the end of the radial upward movement of the arch d a flange is formed around the edge of the circular sheet of metal. The flange may stand at any desired angle, it only being necessary to arrest the operation of the machine at the proper point. Power for operating the shafts l^1 and i^2 may be applied by gear-wheels or by belts passing around them.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The rotating and bending-mandrels $g g'$ in combination with the guide-plate n and adjustable table o , having threaded rods p and nuts q , substantially as and for the purposes described.

2. The shafts $f f$, gear-wheels $k l^1 2 3 4 5$, shaft l^1 , and crank l^2 , in connection with the mandrels $g g'$ for imparting a rotating motion to them, substantially as described.

3. The swinging arch d carrying the rotating and bending-mandrels $g g'$, substantially as described.

4. The segmental gear-wheel h rigidly attached to the swinging arch d , gear-wheel i^1 , and crank i^2 , in combination with the swinging arch d for operating the same so as to make it describe the arc of a circle of which the line xx is the center, substantially as and for the purposes described.

5. The devices described and shown, or their equivalents, for imparting simultaneously a rotary and a radial motion to the mandrels $g g'$, for the purposes described.

In testimony whereof I, the said SETH LOWEN, have hereunto set my hand.

SETH LOWEN.

Witnesses:

W. N. HOWARD,
THOS. B. KERR.