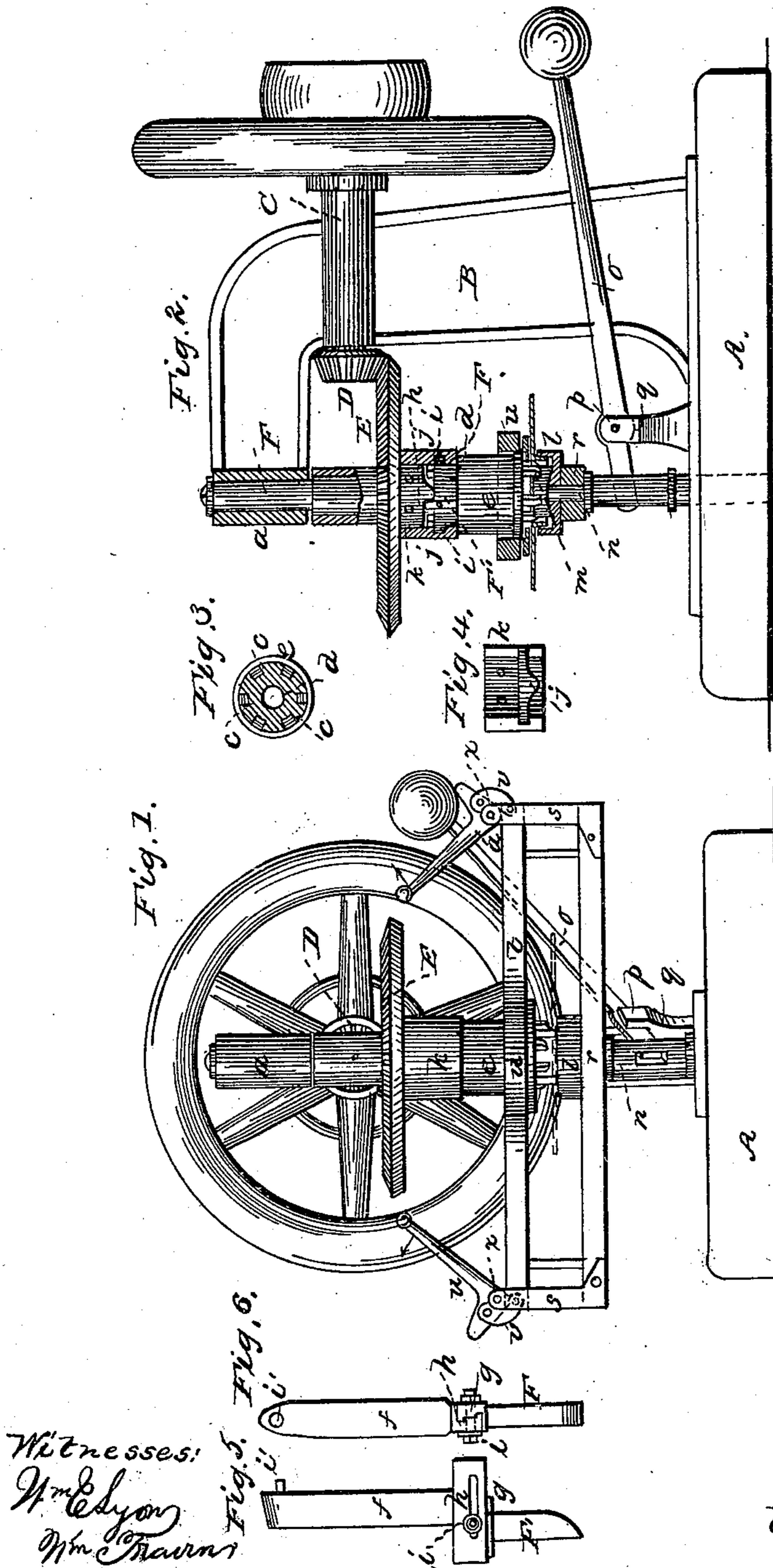


E. PAYE.

Machine for Turning Boiler Flanges.

No. 55,209.

Patented May 29, 1866.



Witnesses:
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EDWARD PAYE, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND CORNELIUS H. DELAMETER, OF THE SAME PLACE.

IMPROVEMENT IN MACHINES FOR TURNING BOILER-FLANGES.

Specification forming part of Letters Patent No. 55,209, dated May 29, 1866.

To all whom it may concern:

Be it known that I, EDWARD PAYE, of the city, county, and State of New York, have invented a new and Improved Machine for Turning Boiler-Flanges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of this invention. Fig. 2 is a sectional side elevation of the same. Fig. 3 is a transverse section of the hammer-guide. Fig. 4 is an inside elevation of the grooved collar which supports the cam and the hammers. Fig. 5 is a side elevation of one of the hammers in a larger scale than the previous figures. Fig. 6 is a front elevation of the same.

Similar letters of reference indicate like parts.

This invention consists in the employment or use of a series of hammers in combination with cams or other suitable mechanism by which a reciprocating motion can be imparted to said hammers and with a suitable device for supporting the flue-sheet in the required position in such a manner that by a succession of blows of the hammers the flange of the flue-sheet is turned with little trouble and in a comparatively short time.

It consists, further, in making the hammers adjustable on their shanks, so that the same, when placed in their sockets, can be moved in a radial direction and set for flanges or flues of different diameters; also, in the use of a cam, which depresses the hammers in pairs, situated on opposite sides of the shaft in such a manner that all side strain on the shaft is avoided; further, in supporting the hammers by pins or studs projecting from their shanks and catching in a cam-groove in the inner surface of a collar which is secured to and surrounds the cam in such a manner that said hammers are compelled to rise and fall by the combined direct action of the cam and cam-groove; further, in providing the bottom ring with a center, for the purpose of bringing the tube-sheet in position while hot; also, in securing the sheet between the face of two rings situated in a rising and falling frame in such a manner

that the hammer can act freely on the flange and the sheet can be readily fed up against the hammers; finally, in the arrangement of lever-clamps, in combination with the rings, in such a manner that by a simple motion of two levers the rings are compressed and the sheet is clamped tight between them.

A represents the bed-plate of my machine, from which rises a standard, B, that forms the bearing for the driving-shaft C. On the inner end of this shaft is mounted a bevel-pinion, D, which gears into a bevel-wheel, E, as clearly shown in Fig. 2 of the drawings. This bevel-wheel turns loosely on a vertical arbor, F, which is firmly secured in the rounded end or boss *a* of the standard B. The hub of the bevel-wheel E is long, and forms a steady guide for the same, and its bottom edge forms a cam, *b*, which is provided with two noses, one opposite the other, and which, being rotated with the wheel E, acts on the hammers F'. These hammers are guided in vertical slots *c* in a collar, *d*, which is attached to the bottom end of the vertical arbor F, and they are held in these grooves by a sleeve, *e*, which surrounds the collar *d*, as shown in Figs. 2 and 3. In practice the hammers will be connected to their shanks *f* by means of grooved heads *g*, (see Figs. 5 and 6,) which are adjustable on guide-brackets secured to the bottom ends of the shanks, said heads being fastened to the brackets by screw-bolts *i*, which pass through slots in said brackets, and allow of moving the hammers in or out to suit different diameters of flanges.

The shanks of the hammers are provided with studs *j*', secured in the same near their upper ends, and these studs catch in a groove, *j*, in the inner circumference of a ring, *k*, which is secured by screws or other suitable means to the outer surface of the cam *b*. The shape of the groove *j* corresponds to that of the working edge of the cam *b*, (see Fig. 4,) and the ring *k* is so arranged in relation to said cam that the groove *j* supports the studs and causes the hammers to rise after they have been depressed by the action of the noses on the cam. In order to facilitate the operation of attaching and removing the ring, it is made in two halves, each of which is secured to the cam, or to the lower part of the hub of the wheel E, by two or more screws or any other suitable means.

The flue-sheet which is to be operated upon by the hammers F, and which is shown in red outlines in Figs. 1 and 2, is provided with the requisite number of holes, equal to the number of flues to be received, and of such a diameter that the flues will fit the same exactly after the operation of turning the flanges is finished. One of these holes after the other is adjusted over a ring or cup, *l*, of steel or any other suitable material, and in order to get the edge of each hole in a concentric position with said bottom ring a center, *m*, rises from its bottom, just large enough to fit the hole in the flue-sheet before the operation of turning the flanges commences. It is obvious that for holes of different diameters different bottom rings will be required.

The bottom ring, *l*, is bored out to fit the top end of a vertical shaft, *n*, which is stepped into a suitable socket in the bed-plate A, and to which a rising and falling motion can be imparted by a lever, *o*. This lever has its fulcrum on a pivot, *p*, in a standard, *q*, which rises from the bed-plate, and it catches into a slot in the shaft *a*, as shown in Fig. 1, or any other suitable means may be employed to raise said shaft. Directly under the bottom ring, and supported by a shoulder of the shaft *n*, is a swivel-bar, *r*, from each end of which rises a slotted standard, *s*, and these standards form the guides for a rising and falling bar, *t*, the central part of which forms a ring, *u*, large enough to pass over the lower portion of the hammer-guide and sleeve *e*. The bar *t* is suspended by curved straps *v* from cam-levers *w*, the fulcrums of which are on pivots *a*, secured in the standards *s*. These levers are so shaped that by turning them up to the position shown in Fig. 1 of the drawings the bar *t* is raised, and by turning them down in the direction of the arrows marked near them in said figures the bar *t* is depressed and the ring *u* is caused to bear on the flue-sheet which is to be operated upon by the hammers.

After the flue-sheet has been clamped in this manner between the two rings *l* and *u*, the swivel-frame is gradually pressed up against

the hammers by the action of the lever *o*, which is loaded with a weight, *y*, of sufficient heft to produce the desired effect, and at the same time the operator turns the swivel-frame back and forth, so that the hammers will strike in different places and the flange will be turned down evenly and uniformly all round.

By these means the operation of turning boiler-flanges is rendered easy, and it can be performed with comparatively little trouble and in much less time than by hand. The hammers and bottom rings can be readily adjusted for flues of different diameters, and a machine is thus obtained of immense practical value for boiler-makers.

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

1. The use, in a machine for turning boiler-flanges, of a series of hammers, F', acted upon by a cam, *b*, so that the flanges are turned by a series of blows, as set forth.

2. Making the hammers adjustable on their shanks by means substantially as herein described, or any other equivalent means, so that the same can be adjusted for flues of different diameters.

3. The arrangement of a revolving cam and cam-groove in combination with the hammers F', said hammers being constructed and operating substantially as and for the purpose described.

4. The arrangement of a center in the bottom ring, *l*, substantially as and for the purpose set forth.

5. The clamp composed of two rings, *u* *l*, in combination with the hammers F', constructed and operating substantially as and for the purpose described.

6. The cam-levers *w*, in combination with the rings *l* and *u*, and with the swivel-bar *r*, constructed and operating substantially as and for the purpose set forth.

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Witnesses:

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