2 Sheets—Sheet 1.

F. P. CADY.

Machine for Forming Joint-Flanges.

No. 207,342. Patented Aug. 27, 1878.

Fig. 1.

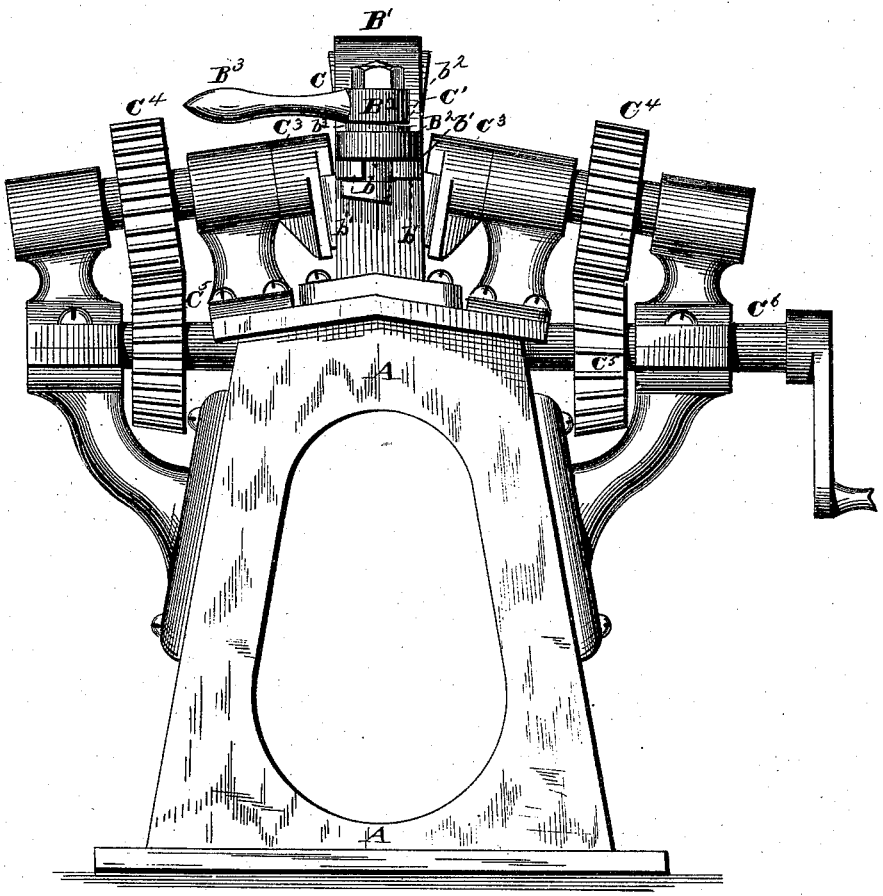
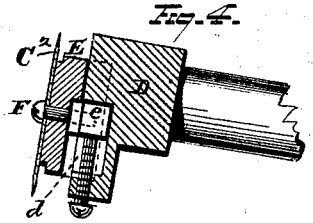


Fig. 4.



WITNESSES

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2 Sheets—Sheet 2.

F. P. CADY.

Machine for Forming Joint-Flanges.

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Fig. 2.

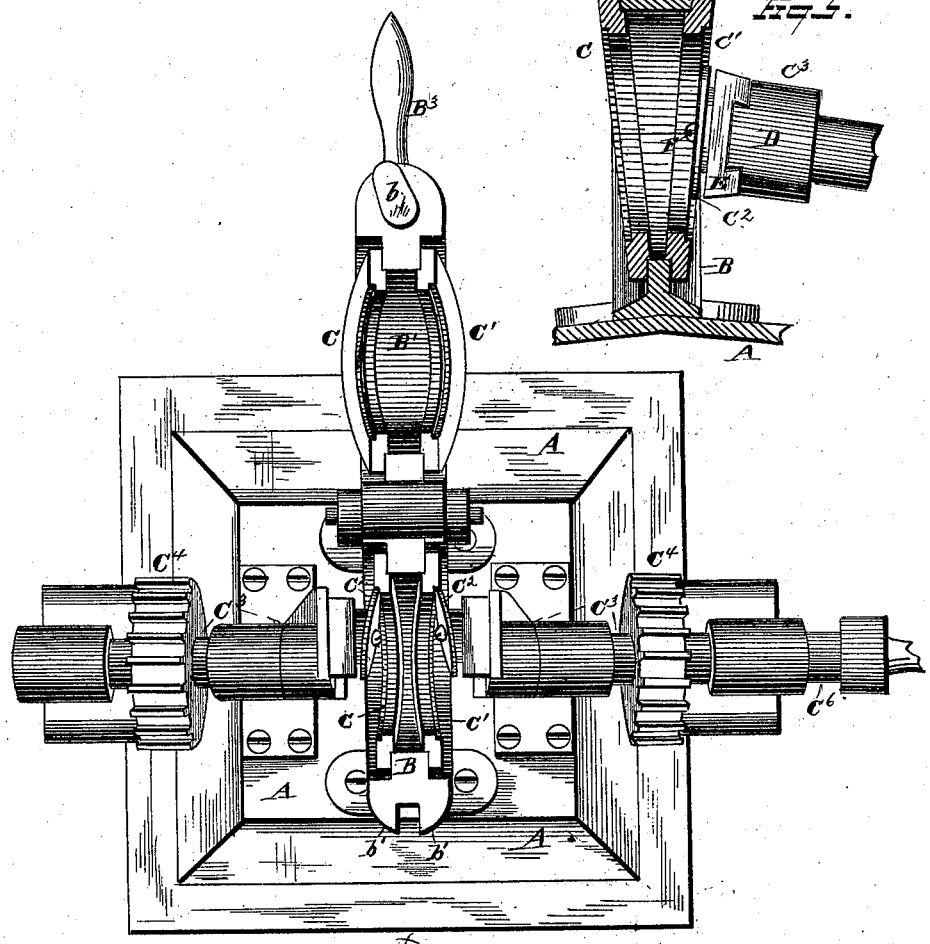


Fig. 5.

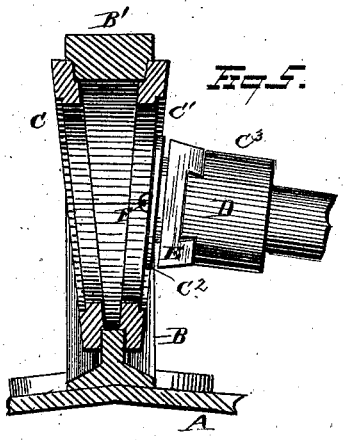
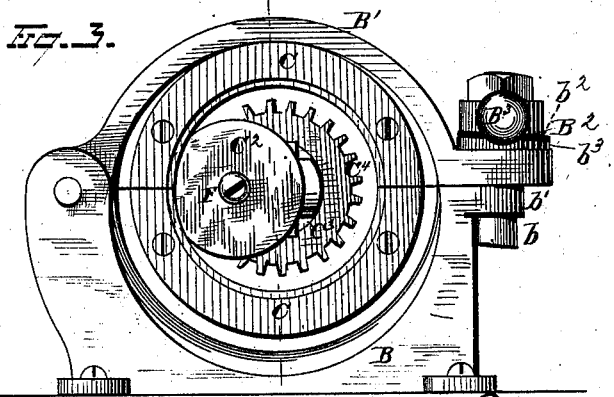


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK P. CADY, OF CLEVELAND, OHIO, ASSIGNOR TO THE HOGEN STAMPED ELBOW COMPANY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR FORMING JOINT-FLANGES.

Specification forming part of Letters Patent No. **207,342**, dated August 27, 1878; application filed May 24, 1878.

To all whom it may concern:

Be it known that I, FRANK P. CADY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in a Machine for Forming Joint-Flanges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in machines for forming flanges upon the ends of tubular sections intended to constitute pipe-joints.

It consists in a machine adapted to simultaneously form a flange respectively upon both ends of a curved tubular section, the same being formed with two annular stationary dies, secured in planes inclined toward each other, and two revolving dies, mounted upon inclined shafts and adapted to maintain a constant angular relation toward their respective stationary dies as they revolve about the same.

In the drawings, Figure 1 is a front elevation of my device as shown with the section B^1 closed and locked; Fig. 2, a plan view of the same device with said section B^1 unlocked and raised; and Fig. 3 is a side view of the holder of my device and one of the dies attached thereto. Fig. 4 is a vertical sectional view in detail of the mechanism by which the revolving dies are each adapted to be adjusted nearer to or farther from their respective stationary annular dies. Fig. 5 is a sectional view in plane passing through line *x y* of Fig. 3.

A is a base or foundation; of any suitable construction, fashion, or material, adapted to accommodate the parts hereinafter to be specified.

B is the holder or retainer, whose function is to receive the section and retain it while flanges are being formed upon its ends. This holder should be constructed in such a manner as to readily admit of a pipe-section being placed and removed, and to this end I prefer constructing it of two hinged sections. B^1 represents a swinging or hinged section of the holder B; B^2, a locking apparatus, for securing the sections together while the flange is being turned on the section.

The vertical rotating pin B^2, secured to the upper hinged section, is provided with a suitable handle, B^3, by which it is operated. It is also formed with a stud, *b*, on its lower extremity, which is adapted to engage with either one of the two projections b^1, which latter are formed on the lower section.

A cam-collar, b^2, is placed between the cam portion b^3 of the handle and that part of the upper hinged section through which the pin B^2 passes. By turning the handle so that the stud of said pin may engage with either one of the projections b^1 the cam of the handle engages with said cam-collar, so as to bring the upper section down closely on the lower section, and hold the two tightly together.

The utility of this provision is apparent when it is considered that at the time of closing said section B^1 the sheet-metal section to be operated upon is already in position between the male and female dies, and the cam engagement enables the dies to be brought properly together, and at the same time to bend the sheet metal at that point and "start" the flange C C^1 on removable dies, made in sections to correspond with sections of the holders. These dies are annular in character. C^2 are revolving dies, fashioned in counterpart of the dies C C^1. The annular dies C C^1 and the revolving dies C^2 may be made relatively male and female, either one to the other, as may be desired. The revolving dies C^2 are adjustably fixed upon cranks, which form a part of shafts C^3, suitably journaled upon the base A. The shafts C^3 are turned by the pinions C^4, which mesh with gear-wheels C^5. The gear-wheels C^5 are fixed upon a common shaft, C^6, to which initial power is applied.

This arrangement I show merely as one method of operating the dies C^2. It is manifest that many modifications of this arrangement might be had; for instance, the gear-wheels C^5 might be pulleys operated by belts.

I do not limit myself in any degree to any

specific arrangement for driving the dies C^2. As shown in the drawings, my device is formed as adapted for forming flanges upon sections of curved pipe-joints, and the peculiar pattern of these sections necessitates the inclined position given to the shafts C^3; also, the peculiar inclined position of the dies C and C^1.

The dies C C^1 are made removable from the holder B B^1 for purposes of repair or renewal, or to facilitate the adjustment of dies of different kinds or sizes, as may be desired. The dies C^2 are made removable for the same reasons.

The revolving dies are each adapted to be adjusted to and from the annular stationary dies, against which they respectively work, as follows: A recess, *d*, made in the bearing-block D is adapted to receive the follower *e*, which latter is secured to the slide E; and by the adjustment of screw F, which engages with said follower, the slide upon which the revolving die is secured is adjusted and secured at different distances from the axis of the shaft upon which said die is revolved.

This movement of the slide upon its grooved way causes the revolving die to be brought nearer to or carried farther from the stationary annular die against which it works.

In certain cases it may be desirable that a flange be turned only upon one end of a section. In such case but one of the dies C or C^1 and its companion would be employed; and my invention comprehends and includes a device employing but one annular die, C or C^1, and its corresponding revolving die C^2.

The operation of my device is as follows: A tubular section of sheet metal is placed in the holder B, and the swinging section B^1 is locked down over it, whereby the flange is started, as heretofore specified. Now, by the revolution of the dies C^2, (which dies revolve not only upon their own axes, but are also revolved bodily by the rotation of the cranks of the shafts C^3,) said dies C^2 are driven around the circle described by the dies C C^1, and thus a flange is formed corresponding to said dies upon one or both ends of the tubular sheet-metal section held stationary between them. After the flange is formed the swinging section B^1 is unlocked and raised, permitting of the easy removal of the flanged section.

What I claim is—

1. A machine adapted to form flanges simultaneously upon both ends of a curved pipe-section, the same consisting in the combination, with two annular stationary dies located in planes inclined toward each other, of the two revolving dies, secured on inclined shafts and respectively working within said stationary dies, substantially as set forth.

2. In a machine adapted to form flanges upon both ends of a curved pipe-section, the combination, with the two annular stationary dies, located in planes inclined toward each other, of the two revolving dies, respectively adapted to be adjusted nearer to or farther from the stationary dies, within which they work, substantially as set forth.

3. The combination, with an annular stationary die, secured in an inclined position, of a revolving die, mounted upon an inclined shaft, and adapted to sustain the same angular relation to the said stationary die during its entire revolution about the same, substantially as set forth.

4. In a machine adapted to form flanges upon both ends of a curved pipe-section, the combination, with the two inclined shafts which bear the rotating dies, of a single actuating-shaft and intermediate gearing mechanism, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK P. CADY.

Witnesses:
JNO. CROWELL, Jr.,
F. TOUMEY.