F. P. CADY.

2 Sheets—Sheet 1.

Pipe-Elbow Machine.

No. 219,617. Patented Sept. 16, 1879.

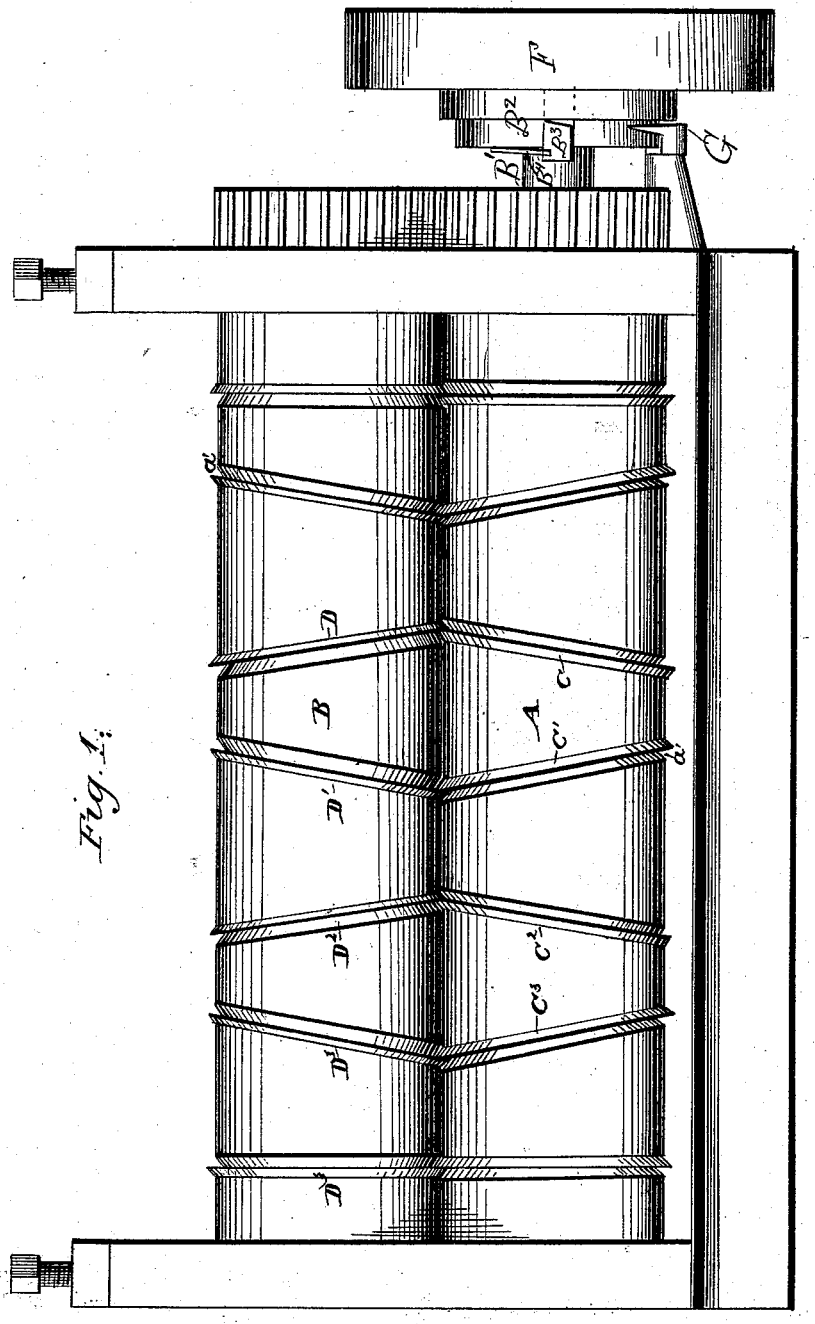

Fig. 1.

WITNESSES

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By Leggett & Leggett.

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2 Sheets—Sheet 2.

F. P. CADY.

Pipe-Elbow Machine.

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Fig. 2.

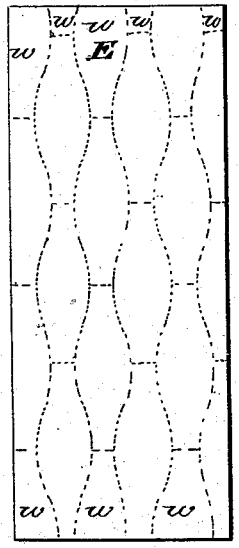


Fig. 3.

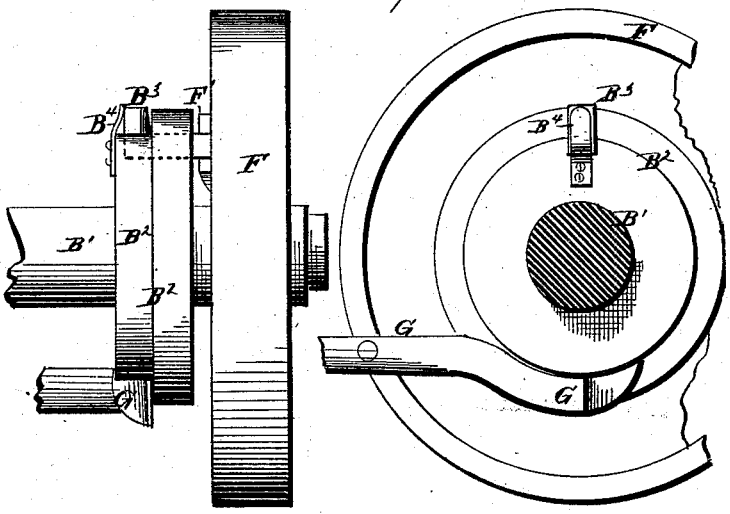
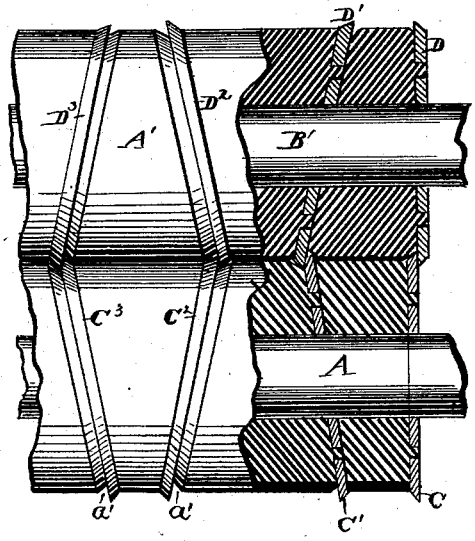
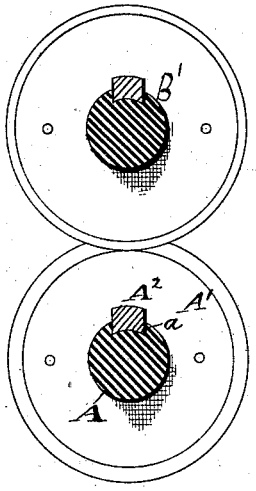


Fig. 4.





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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN PIPE-ELBOW MACHINES.

Specification forming part of Letters Patent No. **219,617**, dated September 16, 1879; application filed April 9, 1879.

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 Machines for Cutting Stove-Pipe Sections; 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 machinery for cutting out the blanks to be employed in the manufacture of stove-pipe elbows; and consists, essentially, in two rollers, one placed close to the other and parallel therewith, each roller being provided with knives set into or formed upon or secured to the surface of the roll, which knives each lie in a plane which makes an angle to the axis of the roll, the knives in one roll being so arranged as to shear with the knives in the other roll, whereby, by a single passage through the rolls, a sheet of metal is cut into the proper-shaped patterns for manufacturing a stove-pipe elbow, as will be hereinafter more fully set forth and claimed.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a plan view of a sheet of metal, indicating by dotted lines the manner in which it would be cut into strips by passing between the rolls, and representing, also, the manner in which the separate strips would be cut for making the proper lengths of pieces. Fig. 3 is a separate view representing mechanism for engaging or disengaging the rolls from the power. Fig. 4 shows how knives may be secured to the rolls.

A is one roll, and B the other. C C^1 C^2, &c., are the knives formed upon or arranged in one of the rolls, while D D^1 D^2, &c., represent the corresponding knives in the other roll. These knives, as will be seen in the drawings, do not pass directly around the roll in planes perpendicular to its axis; but, on the contrary, all these knives, with the exception of the two end knives, lie in planes making an angle with the axis, so that as the two rolls are revolved, and a sheet of metal, E, is fed between them, the knives will sever the metal into strips, which shall be of varying breadths, being first broad and then narrow, and so on throughout its whole length. Each said strip being afterward divided at its narrowest points makes a series of pieces, which correspond with one of the pieces in a stove-pipe elbow. The end knives on each of the rolls pass circumferentially around the rolls in a plane perpendicular to the axis, so that, while the intermediate knives serve to cut out the pieces intermediate between the end pieces of the stove-pipe elbow, the end knives of the rolls cut out the pieces corresponding with the ends of the elbow-joint.

I prefer that the rolls shall be of sufficient length to cut out at one pass from one breadth of metal as many strips as there are pieces in the stove-pipe elbow, for in this way it is apparent that the work will be uniform, there being no more or less of the straight edge or end pieces than will be required for the intermediate pieces.

It is apparent, also, that by this method I am enabled to take a piece of sheet metal of any length and, by feeding it between the rolls, cut it up at one operation into pieces suitable for stove-pipe elbows, and the only wastage will be a small portion at each end out of a long sheet, thus effecting a great saving of material and greatly facilitating the work.

The rolls A B are geared in any suitable manner so as to turn in opposite directions—that is, so that they will turn together, as shown in the drawings, to draw the metal through between the rolls. F is a loose pulley attached to the shaft B^1, and B^2 is a collar attached rigidly to the shaft B^1. B^3 is a movable stop extending through the rigid collar B^2 and against the face of the loose pulley F. This movable stop is held in place by a yielding spring, B^4. A ratchet-tooth, F', is placed upon the face of the loose pulley F. Now, it is apparent that while the loose pulley F is turned in a direction to force the shoulder or edge of the ratchet against the stop B^3 the loose pulley will drive the rolls A and B. When, however, the operator desires to stop the rolls from running, there is provided for this purpose a lever, G, which has a thin wedge-

edge that can be brought down upon the rigid collar B^2. Now, as the shaft B^1, carrying the said collar, continues to revolve, the wedge end of the lever will force the stop B^3 out of gear with the clutch F′, permitting the loose pulley to ride past the stop B^3, and therefore to run loosely upon the shaft B^1 without operating the rolls. When the operator desires again to put the rolls in running order, he simply disengages the lever G from the stop B^3, thus allowing the latter to again project against the face of the loose pulley F, and as the clutch comes in contact with the stop the loose pulley becomes a stationary pulley and causes the rolls to revolve.

Of course I do not limit myself to any particular way of causing the rolls to start and stop, the essential feature of the invention being in the rolls themselves, provided with the peculiarly-arranged knives upon their surfaces.

Instead of both rolls being provided with the projecting knives, one could have a series of projecting knives, while the other one may be countersunk for the knives of the opposite roll to pass into them, and in this way shear the metal.

It is apparent that the knives may either be formed upon the surface or may be set into the surface of the rolls, as may be desired; but the form which I have employed and have found to be very satisfactory is as follows, and illustrated more particularly in Fig. 4 of the drawings, A being a suitable shaft, and *a* a groove therein, C being any cutter, and A^1 collars with angular faces. The sides of the collars adjacent to the knives are provided with dowel-pins set into holes in the knives, and the collars are likewise provided with feathers A^2, which set into the groove in the shaft or rolls, so as to prevent them from turning on the rolls.

It is thus seen when the collars are all in their proper places, embracing the knives or cutters between them, it forms a rigid structure, and is very simple in its construction.

It will be observed that the collars A^1 are beveled at *a′* adjacent to the knives, so that when the metal is introduced between the rolls the sheet will be held snugly by the elevated portions between the knives; but as the metal is cut the edge will be driven down into the recess formed by the beveled surfaces *a′*, thus causing the metal to cut freely without drawing.

The knives should, (some of them,) as shown in the drawings, be made to cut upon one side of the knives of the opposite roll, and some upon the other side of the knives of the opposite roll, in order that there may be no tendency to thrust one roll longitudinally away from the other, and thus, by lost motion or wear, widen the space between the knives and prevent them from cutting.

While my invention has been described as more particularly adapted to cutting out of patterns for stove-pipe elbows, I would have it understood that the invention is equally well adapted for cutting out any other irregular forms, and will do so without causing the metal to draw in the process of cutting, it being only necessary to give to the knives and rolls their proper shapes for cutting out the desired forms.

What I claim is—

1. In a machine for cutting sheet metal into forms for pipe-elbows, rolls A B, provided with a series of angularly-disposed knives, as described, sufficient in number to cut two or more strips side by side in a single passage through the machine, making the proper cut to form two adjacent parts for an elbow without wastage, substantially as described.

2. The cutting-rolls A B, provided with a series of knives, C C^1 C^2 D D^1 D^2, the said rolls being provided with knives sufficient in number for cutting from a sheet of metal, in a single passage between the rolls, and without wastage, as many strips as there are pieces in a pipe-elbow, and the knives so arranged on the surface of the rolls as to cut the pieces to the proper pattern, 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:

F. TOUMEY,

W. E. DONNELLY.