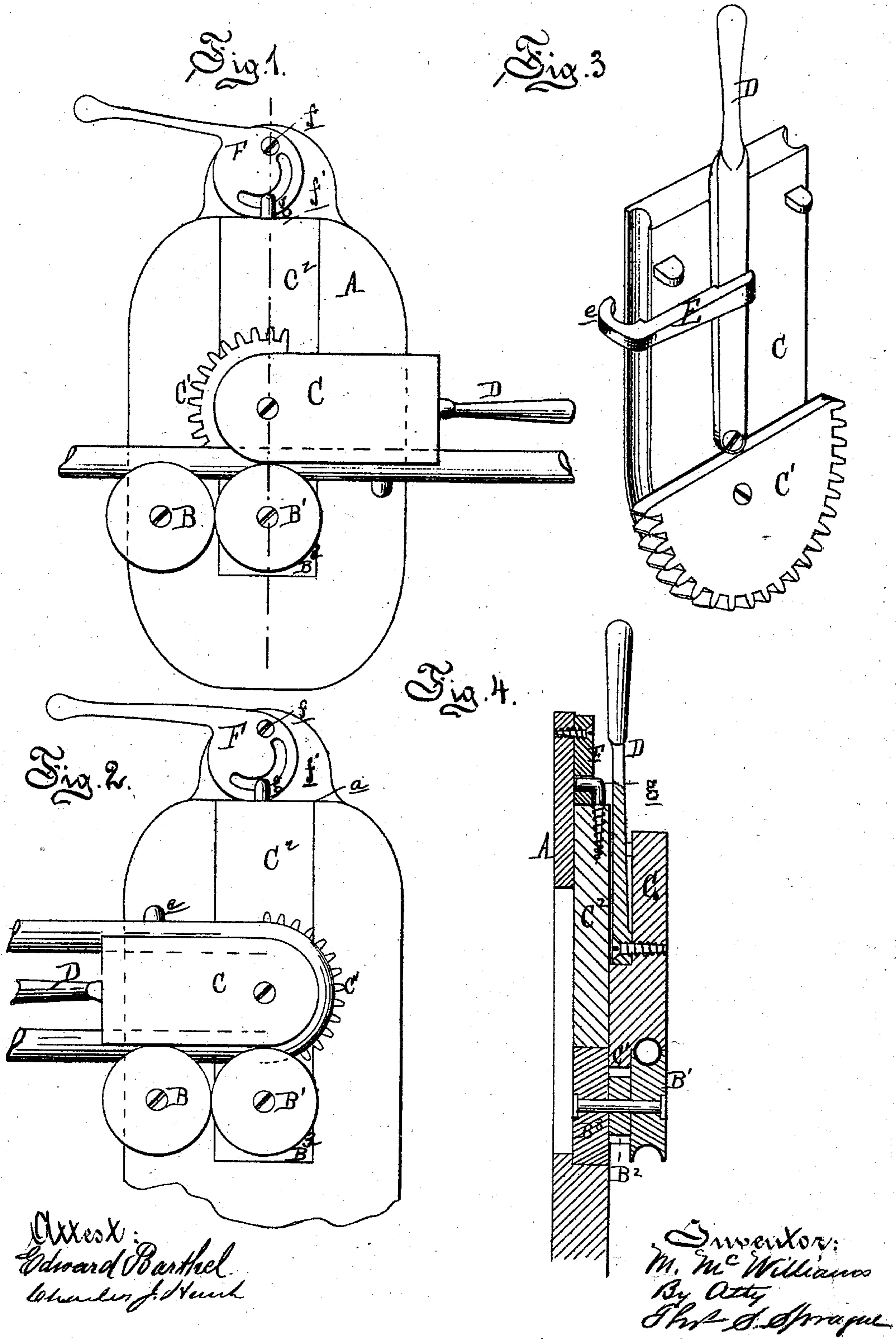


M. McWILLIAMS.

MACHINES FOR BENDING TUBES, &c.

No. 171,402.

Patented Dec. 21, 1875.



# UNITED STATES PATENT OFFICE.

MICHAEL McWILLIAMS, OF DETROIT, MICH., ASSIGNOR TO HIMSELF, JOSEPH McWILLIAMS, AND EDWARD DEVINE, OF SAME PLACE.

## IMPROVEMENT IN MACHINES FOR BENDING TUBES, &c.

Specification forming part of Letters Patent No. **171,402**, dated December 21, 1875; application filed October 9, 1875.

*To all whom it may concern:*

Be it known that I, MICHAEL McWILLIAMS, of Detroit, in the county of Wayne and State of Michigan, have invented an Improved Pipe-Bending Machine, of which the following is a specification:

My invention has for its object to furnish a machine by means of which wrought-iron pipes can be bent to any desired angle; and it consists in the combination of the principal operative parts, all as more fully hereinafter explained.

Figure 1 is a plan view showing a pipe laid in the machine ready to be bent. Fig. 2 is a similar view, with the pipe bent. Fig. 3 is a bottom perspective of the rotating former. Fig. 4 is a longitudinal section on the line *x x*, in Fig. 2.

In the drawing, A represents the bed-plate, near the right-hand side of which is pivoted a sheave B, having a half-round groove in its periphery. B<sup>1</sup> is a similar sheave, cast with a pinion, B<sup>2</sup>, on its bottom, the whole being pivoted to a block, B<sup>3</sup>, which slides loosely in a dovetail way, *a*, in the bed-plate. C is a former, having a semicircular end, in the sides and rim of which is a half-round groove. Secured to the bottom of the former is a geared segment, C<sup>1</sup>, which engages with the pinion B<sup>2</sup> when the machine is in operation, the former and segment being pivoted to a block, C<sup>2</sup>, which slides in the dovetail way above mentioned. The former and segment are rotated by a lever, D, pivoted to the under side of the former, its outer end projecting from under the same between two studs, *d d*, against which it strikes. E is an arm projecting from the left hand of the lever D, having an upturned end, *e*, to clasp the pipe when

laid in the former. F is an eccentric lever, pivoted at *f* to the projection *f'* of the bed-plate. The eccentric lever is connected by a hook, *g*, to the tail of the block C<sup>2</sup>, and by which the latter is moved back and forth in the operation of the machine. To bend a pipe the block C<sup>2</sup> and former are retracted by means of the eccentric lever. The pipe, properly heated, is laid in the grooves of the sheaves, when the former is turned to the left, and moved up to it. At the same time the segment is engaged with the pinion under the sheave B<sup>1</sup>. The pipe may now be bent to any degree of curvature required by throwing around the former. The pinion of the sheave B<sup>1</sup> being of less radius than the segment the said sheave will rotate more rapidly than the former, and consequently draw the pipe faster on the outside of the curve, thereby preserving the shape of the pipe in the bend. The sheave B<sup>1</sup> and the former may be changed for others to fit various diameters of pipe. The eccentric lever serves as a lock to keep the former in place, while a pipe is being bent; but I do not wish to confine myself to the use of such lever for advancing and retracting the former, as there are various means by which the same effect could be accomplished.

What I claim as my invention is—

In a bending-machine, substantially as described, the combination of the geared sheave pivoted to a sliding block, with the geared former also pivoted to a block sliding in the same ways in the bed-plate, substantially as described.

MICHAEL McWILLIAMS.

Witnesses:

H. S. SPRAGUE,  
CHARLES J. HUNT.