(No Model.) 3 Sheets—Sheet 1.

H. E. FOWLER.

MACHINE FOR BENDING PIPE.

No. 417,553. Patented Dec. 17, 1889.

Fig. 1.

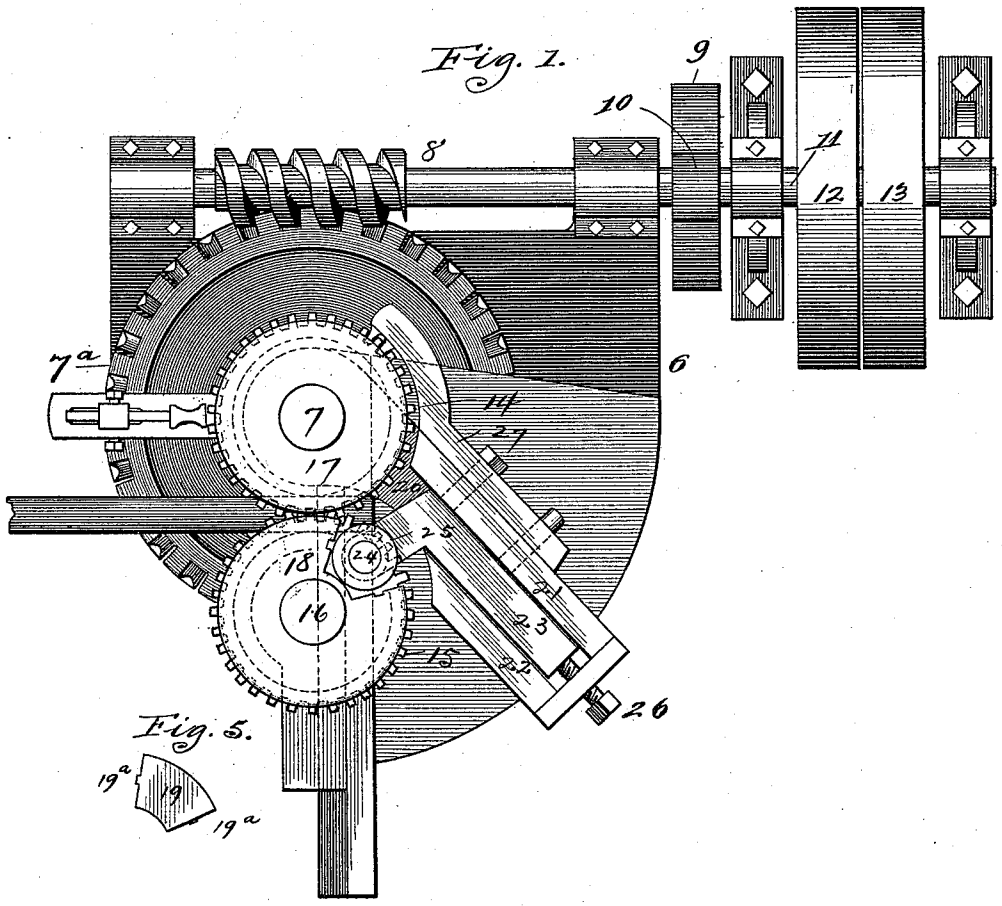


Fig. 5.

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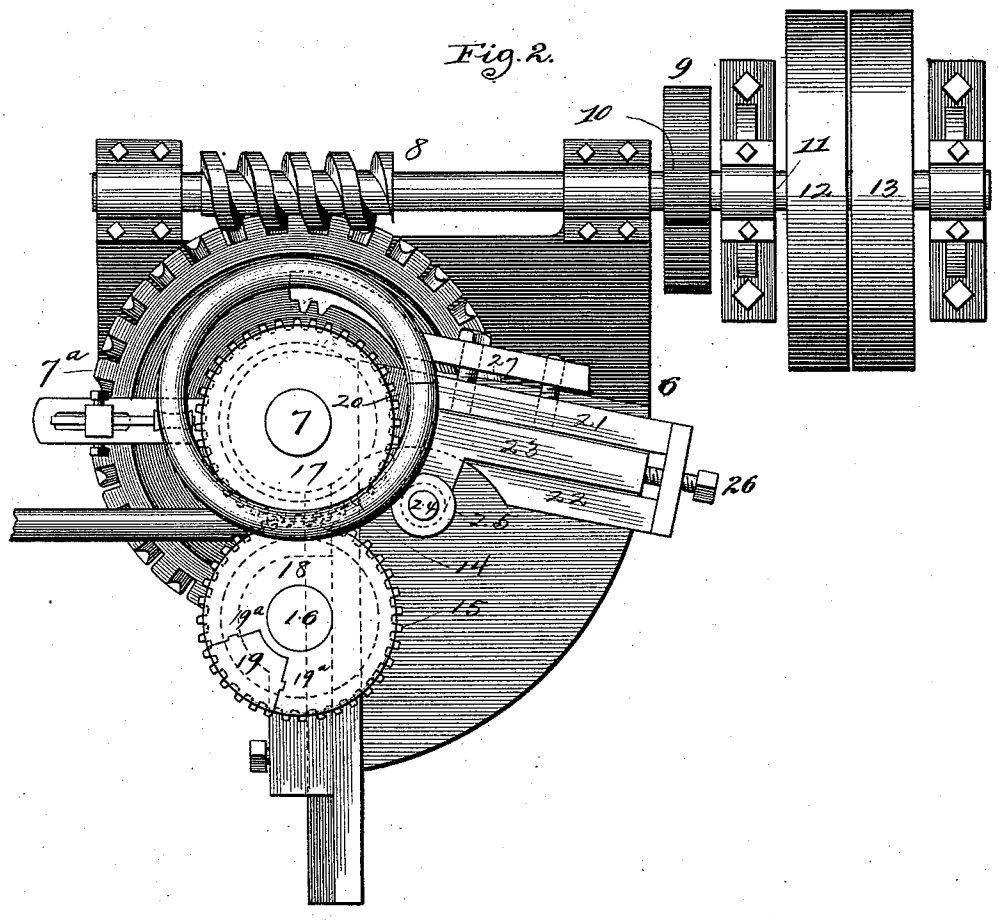
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H. E. FOWLER.

MACHINE FOR BENDING PIPE.

No. 417,553. Patented Dec. 17, 1889.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

H. E. FOWLER.

MACHINE FOR BENDING PIPE.

No. 417,553. Patented Dec. 17, 1889.

Fig. 3.

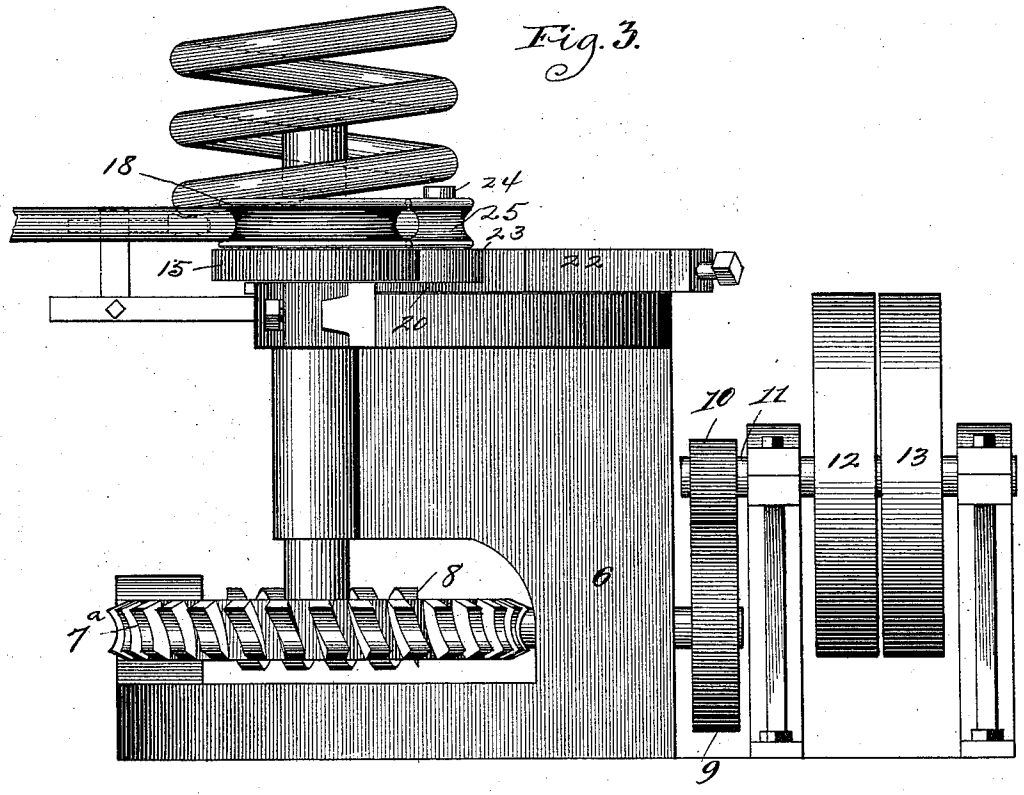
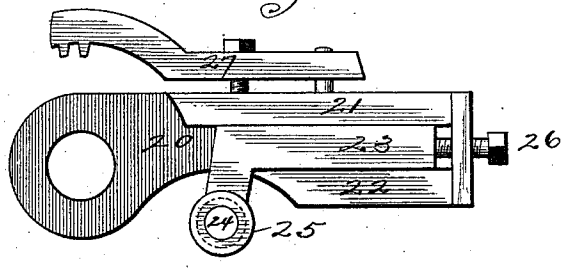


Fig. 4.



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UNITED STATES PATENT OFFICE.

HERBERT E. FOWLER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE UNITED STATES PIPE BENDING AND COILING COMPANY, OF CHICAGO, ILLINOIS.

MACHINE FOR BENDING PIPE.

SPECIFICATION forming part of Letters Patent No. 417,553, dated December 17, 1889.

Application filed October 1, 1889. Serial No. 325,690. (No model.)

To all whom it may concern:

Be it known that I, HERBERT E. FOWLER, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Machines for Bending Pipe, of which the following is a specification.

My invention relates to machines for bending metal pipe or tubing, and more particularly to a machine wherein pipe is bent into a coil, either cylindrical or conical.

A machine of the general character to which my improvement relates is described in Letters Patent of the United States issued to me on the 21st day of February, 1889, Nos. 397,712, 397,713, and 397,793. It is desirable in machines of this class to provide mechanism for bending pipe from its very end, whereby all waste is prevented.

My present invention relates more particularly to an improved means to that end; and it consists in the combination of a pair of grooved bending rolls or dies set in the same horizontal plane and between grooved edges of which pipe is forced, one of said rolls having a removable peripheral segment, into the place of which a third bending-roll of smaller diameter may be projected to engage the end of the pipe when the bending is commenced, and when the bending has progressed sufficiently to free the third bending-roll from the segment-space said segment is replaced, and the bending is then continued by the continuous rotation of the coils in the same direction.

In the accompanying drawings, Figure 1 is a plan view of a machine of this general character, showing the position of the parts at the commencement of the bending. Fig. 2 is a similar view showing the parts after a turn of the coil has been formed, with the third roller drawn out of the segment-space and with the segment in place. Fig. 3 is a side elevation of the machine; Fig. 4, a detail plan view of a swinging plate with the third roll mounted thereon and means whereby said roll is carried around in the initial stages of the bending; and Fig. 5 is a plan view of the segment removed from the bending-roll.

6 represents the frame of the machine, in which is rotatably journaled an upright driving-shaft 7, on the lower end of which is a worm-gear 7^a, driven by a worm-shaft 8, to which motion is imparted through the gears 9 10, the latter being mounted on the pulley-shaft 11, carrying pulleys 12 13. The driving-shaft carries toward its upper end a spur-gear 14, intermeshing with a similar gear 15 on the parallel shaft 16, which shaft is rotatably secured in the frame. Upon the shafts 7 and 16 are mounted the bending-rolls 17 18, the latter having a removable segment 19, which will be adapted by means of the lugs 19^a, entering corresponding grooves in the roll 18, to be removably secured therein.

20 is a swinging plate bearing at one end thereof upon a stud 24 a small grooved bending-roll 25, which will be of such diameter that it may freely enter the segment-space when the latter is removed from roll 18. This arm may be adjusted back and forth by means of a set-screw 26.

27 is a rack, which is secured on the side of the swinging plate 20, and the teeth of which are adapted to engage with the spur-gear on the main driving-shaft when the bending commences, so that the pipe will be bent and the diameter of the coil determined thereby when the operation commences. When the bending has proceeded to such a point that the diameter of the coil is determined, the rack-plate will be disengaged by loosening the set-screws 28 29, the segment will be inserted in the roll 18, and the bending may proceed uninterruptedly by the continuous rotation of the rolls 17 18 in the same direction.

By the means above described it will be observed that the bending commences at the very end of the pipe, the construction being such that the third bending-roll is brought into such proximity to the first as to bear directly upon the pipe.

I claim—

1. In a machine for bending and coiling pipe, the combination, with the primary bending-rolls, one of which has a removable seg-

ment, of a bending and guiding roll adjustably mounted and adapted to be projected into the segment-space when the latter is removed, whereby it may be brought to impinge upon the end of the pipe when the bending commences, substantially as described.

2. In a machine for bending and coiling pipe, the combination, with the primary rolls, one of which has a removable segment, of a bending and guiding roll mounted on a swinging plate, having a rack-bar adapted to be engaged with the gearing during the initial bending, whereby to bend the pipe from its end, substantially as described.

HERBERT E. FOWLER.

Witnesses:
FREDERICK C. GOODWIN,
C. C. LINTHICUM.