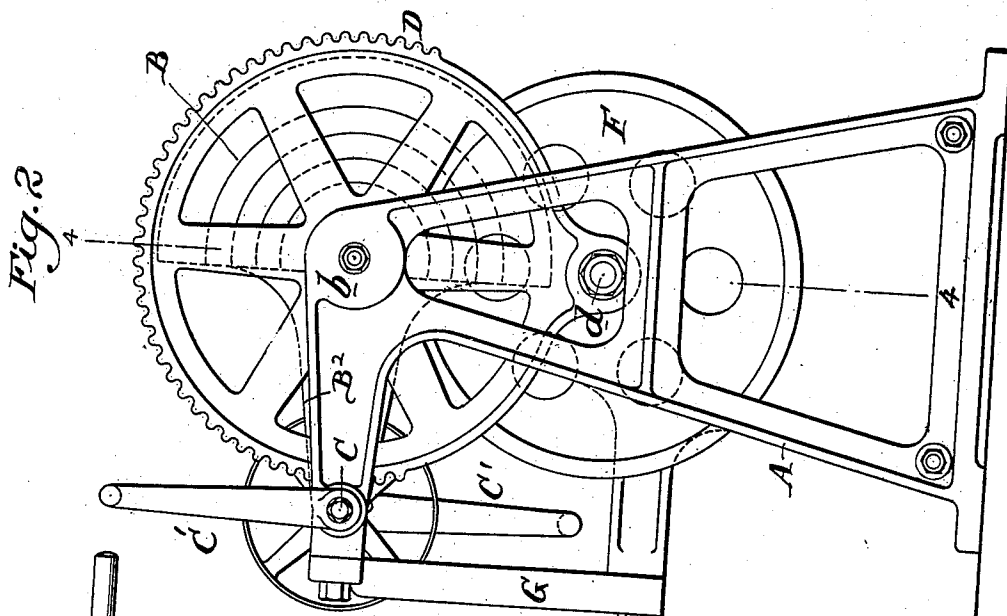
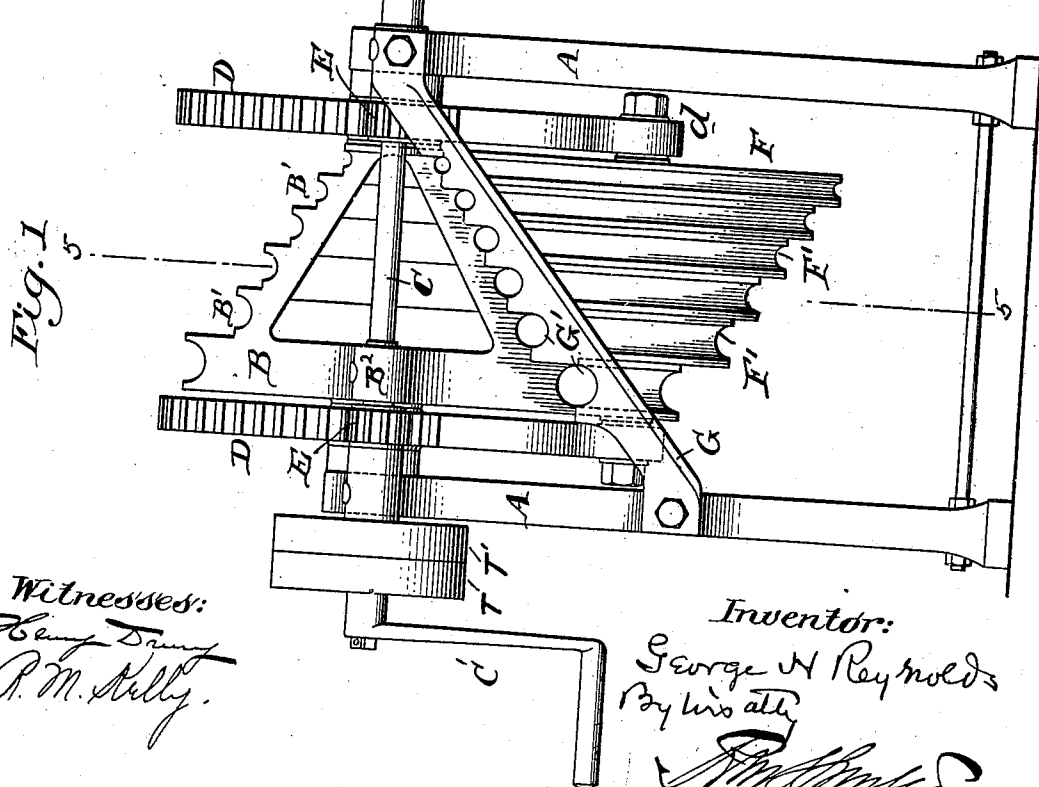


No. 828,338.

PATENTED AUG. 14, 1906.

G. H. REYNOLDS.
PIPE BENDING MACHINE.
APPLICATION FILED OCT. 14, 1905.

3 SHEETS—SHEET 1.



Witnesses:
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P. M. Kelly.

Inventor:
George H. Reynolds
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[Signature]

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3 SHEETS—SHEET 2.

Fig. 3

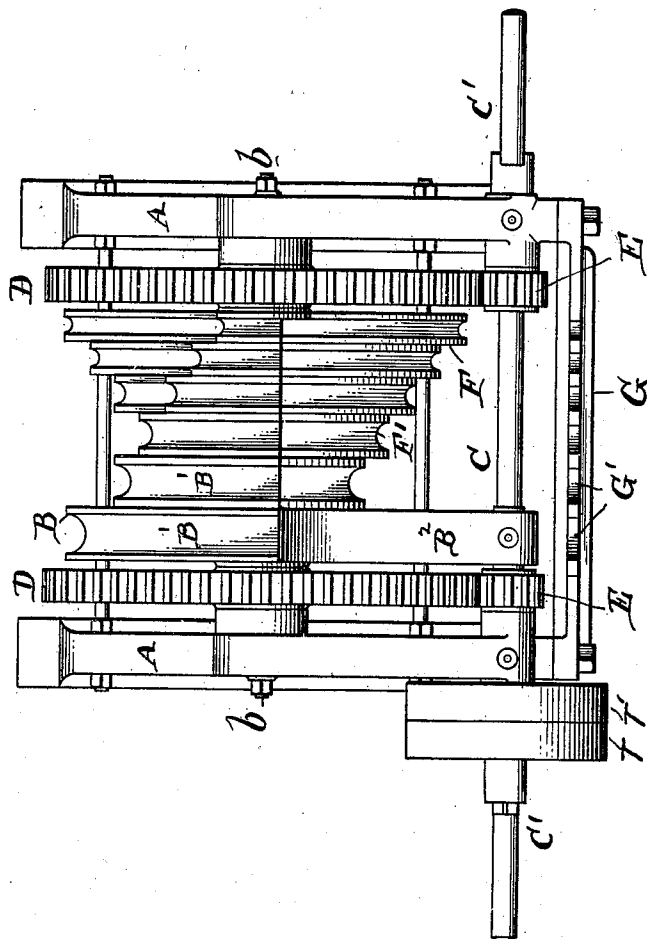
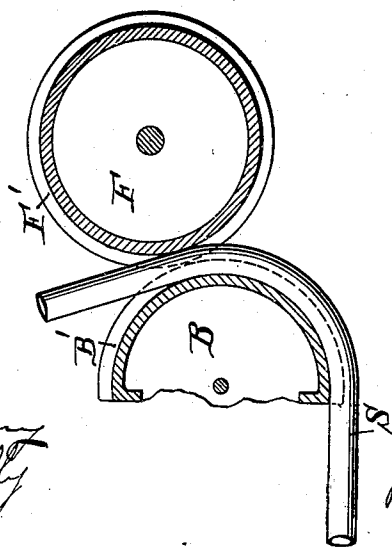


Fig. 6



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3 SHEETS—SHEET 3.

Fig. 5

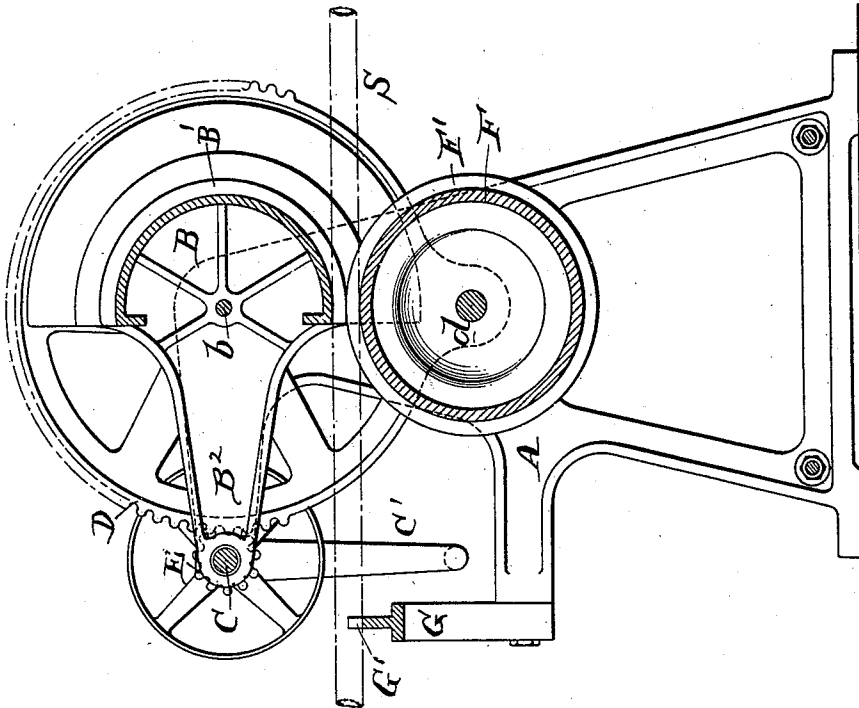
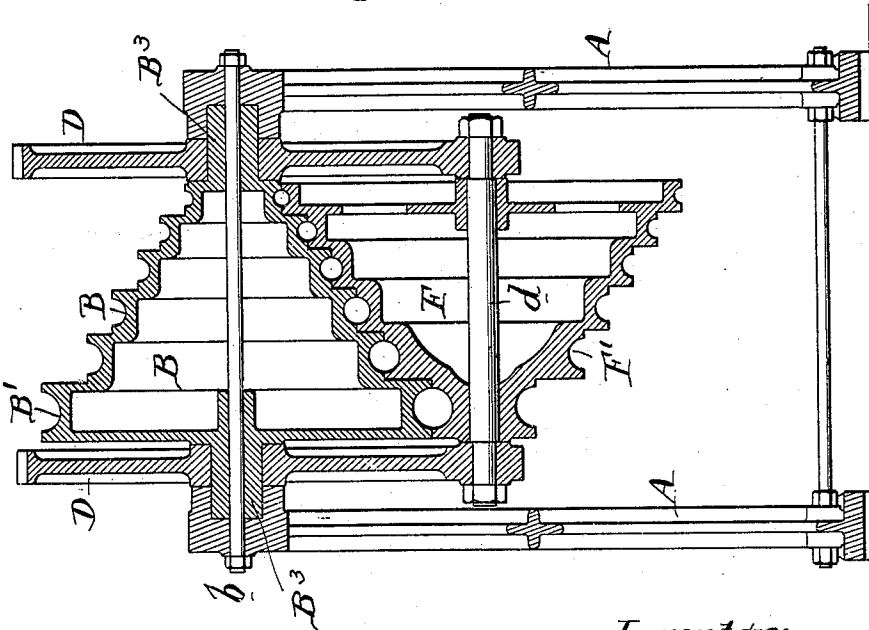


Fig. 4



Witnesses:
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R. M. Kelly.

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE H. REYNOLDS, OF MANSFIELD DEPOT, CONNECTICUT, ASSIGNOR
TO THE PIPE BENDING MACHINE COMPANY, A CORPORATION OF
NORTH CAROLINA.

PIPE-BENDING MACHINE.

No. 828,338.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed October 14, 1905. Serial No. 282,725.

To all whom it may concern:

Be it known that I, GEORGE H. REYNOLDS, of Mansfield Depot, county of Tolland, and State of Connecticut, have invented an Improvement in Pipe-Bending Machines, of which the following is a specification.

My invention has reference to pipe-bending machines; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a simple, efficient, and durable machine for bending pipes of various sizes and preferably to curves of different radii.

My invention consists of a frame having secured thereon a semicone having its curved face provided with a series of grooves, combined with a cone inversely arranged and having its circumference correspondingly grooved and hung to swing concentrically about the semicone, so as to be capable of bending a tube around its curved portion, means to rotate or rock the cone about the semicone, and a support or guide for the pipe, whereby it is properly guided between the cone and semicone and held during the bending operation.

My invention also comprehends details of construction, which, together with the features above specified, will be better understood by reference to the drawings, in which—

Figure 1 is a front elevation of my improved pipe-bending machine. Fig. 2 is a side elevation of same. Fig. 3 is a plan view of same. Fig. 4 is a sectional elevation on line 4 4 of Fig. 2. Fig. 5 is a sectional elevation on line 5 5 of Fig. 1, and Fig. 6 is a sectional view showing the action of the cone and semicone in bending the pipe.

A is the main frame. B is a semicone fitted to the two side parts of the main frame at B³ B³, and held in place by a bolt b. To prevent the semicone B from revolving, it is provided with an arm B², extending laterally and sleeved on the shaft C. The curved face of the semicone is provided with a series of curved grooves B' of different radii, and preferably the groove of greatest radius is also of greatest diameter.

D D are two segmental gear-frames jour-

naled upon the side parts B³ of the semicone B, so as to be pivoted concentric with it. These frames D are connected by a shaft d, upon which is journaled the cone F, having the circumferential grooves F' corresponding to those on the semicone B, but in the inverted order, so that the groove of smallest diameter forms a circle of the greatest radius and the groove of largest diameter forms a circle of the smallest radius.

The successive diameters of the stepped portions of the cones B and F are preferably made to closely fit, so that the pipe is completely encircled by the two semicircular grooves of the respective cone parts B and F, as will be readily understood by reference to Figs. 4 and 6.

The segmental gear-frames D D mesh with the pinions E E on the power-shaft C, which is journaled in the main frame and provided with hand-cranks C' at each end, and when the said frames D D are rocked the cone-frame F is carried around against the curved face of the semicone frame or form B, as shown in Fig. 6, so as to wrap or bend the pipe over the curved surface of said semicone B as a form or mold.

To support the pipe during the bending operation, a guide-frame G is provided. As shown, it consists of an oblique frame secured to the main frame and having a series of grooves or notches, preferably semicircular, corresponding with the grooves in the cone F, as clearly shown in Fig. 1. The obliquity of the guide-frame conforms to the obliquity of the series of apertures formed between the semicone B and cone F in the initial position for receiving a pipe to be bent. This guide supports the rear end of the pipe while the forward end is being bent upward, Figs. 5 and 6.

While I have shown the shaft C provided with hand-cranks C', it may be operated or assisted by a belt running over the fast and loose pulleys T T'. Any suitable means for applying power to the shaft C may be employed other than the means shown.

The operation will now be understood. A pipe S being placed between the cone parts B and F and supported by the guide G, as indicated in Fig. 5 in dotted lines, the shaft C is rotated. The rotating pinions E E cause the rack-frames D D to rotate and swing the cone

F forward and upward about b as an axis, which action bends or wraps the pipe around the curved face of the semicone form, as shown in Fig. 6. As shown, the construction of the machine is such as to have capacity for making return-bends or any bends of less angle, as desired.

The part B acts as a form over which the pipe is bent and may have more or less circumferential curvature. This part B is a conical structure and is preferably made less than circular, because ordinarily a semicircle or semicone is amply sufficient in the commercial bending of pipes, for which this machine is designed. The grooves in the cone portions B F and guide G may be of any shape desired to correspond to the particular cross-section of the tubular section to be bent; but ordinarily the cross-section would be circular.

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

1. In a machine for bending pipe, the combination of a form having a conically-arranged series of grooves, a cone having corresponding grooves arranged in the inverse order, means for moving the cone circumferentially about the conical form consisting of two frames journaled respectively at the ends of the form and power devices for rocking said frames.

2. In a machine for bending pipe, the combination of a main frame, a form having a conically-arranged series of grooves rigidly secured to the main frame, a cone having corresponding grooves arranged in the inverse order, means for moving the cone circumferentially about the conical form journaled to the main frame at each end of the form, and a guide for supporting the pipe in alinement with the apertures between the cone and form.

3. In a machine for bending pipe, the combination of a form having a conically-arranged series of grooves, a cone having corresponding grooves arranged in the inverse order, a rocking frame in which the cone is journaled and by which it is moved about the form, a guide for the pipe, a rotary power-shaft, and gearing for rocking the rocking frames from the power-shaft.

4. In a machine for bending pipe, the combination of a form having a conically-arranged series of grooves of different diameters, a cone having corresponding grooves ar-

ranged in the inverse order, and means for moving the cone circumferentially about the conical form.

5. In a machine for bending pipe, the combination of a main frame, a semiconical form having a series of circumferential grooves of different radii secured to the main frame, two segmental rack-frames journaled concentric with the axis of curvature of the semiconical form and adapted to be rocked about it, a frame having a conical surface journaled in the segmental frames and provided with circumferential grooves in the inverse order of the grooves in the semiconical form, a power-shaft, and gears on the power-shaft meshing with the racks of the segmental rack-frames.

6. In a machine for bending pipe, the combination of a main frame, a semiconical form having a series of circumferential grooves of different radii secured to the main frame, two segmental rack-frames journaled concentric with the axis of curvature of the semiconical form and adapted to be rocked about it, a frame having a conical surface journaled in the segmental frames and provided with circumferential grooves in the inverse order of the grooves in the semiconical form, a guide having a series of guide portions for the pipes arranged obliquely in line with the grooves in the semiconical form, a power-shaft, and gears on the power-shaft meshing with the racks of the segmental rack-frames.

7. In a bending-machine for pipes and rods of circular cross-section, a main frame combined with a curved form fixed to the main frame and having a series of conically-arranged stepped portions having the cylindrical surfaces provided with semicircular grooves of different diameters, a cone also having its surface formed by a series of stepped portions inversely arranged to the stepped portions of the form and having the cylindrical parts of said stepped portions provided with semicircular grooves, means journaled to the main frame for moving the cone about the form, and guides for the pipes or rods in alinement with the grooves in the form also secured to the main frame.

In testimony of which invention I hereunto set my hand.

GEORGE H. REYNOLDS.

Witnesses:

R. M. HUNTER,
R. M. KELLY.