

(No Model.)

2 Sheets—Sheet 1.

S. PHILLIPS.
MACHINE FOR BENDING PIPE.

No. 370,652.

Patented Sept. 27, 1887.

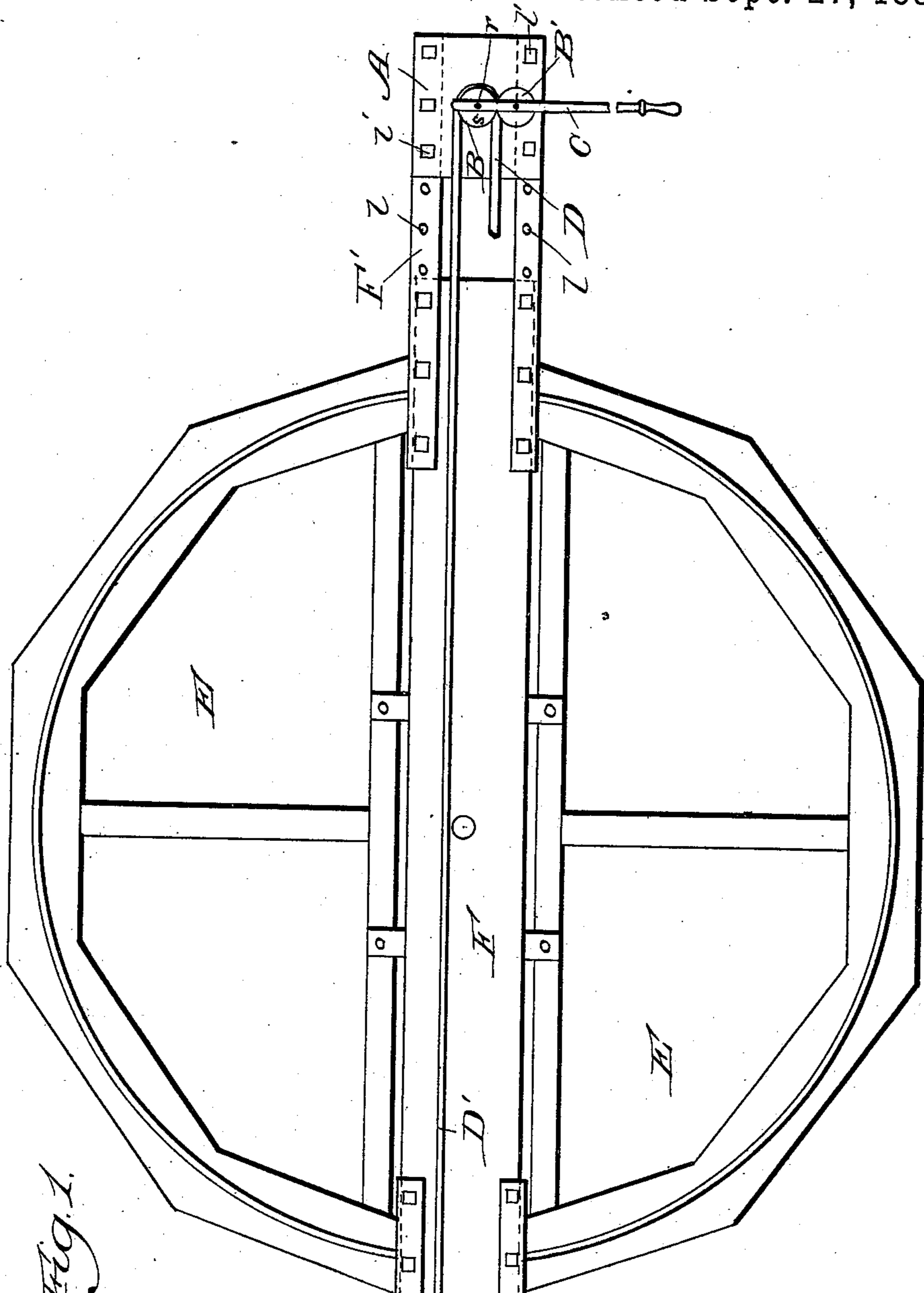


Fig. 1.

Witnesses:
Chas. Gaylord.
As Paré

Inventor:
Sam Phillips.
By Dymenforth and Dymenforth

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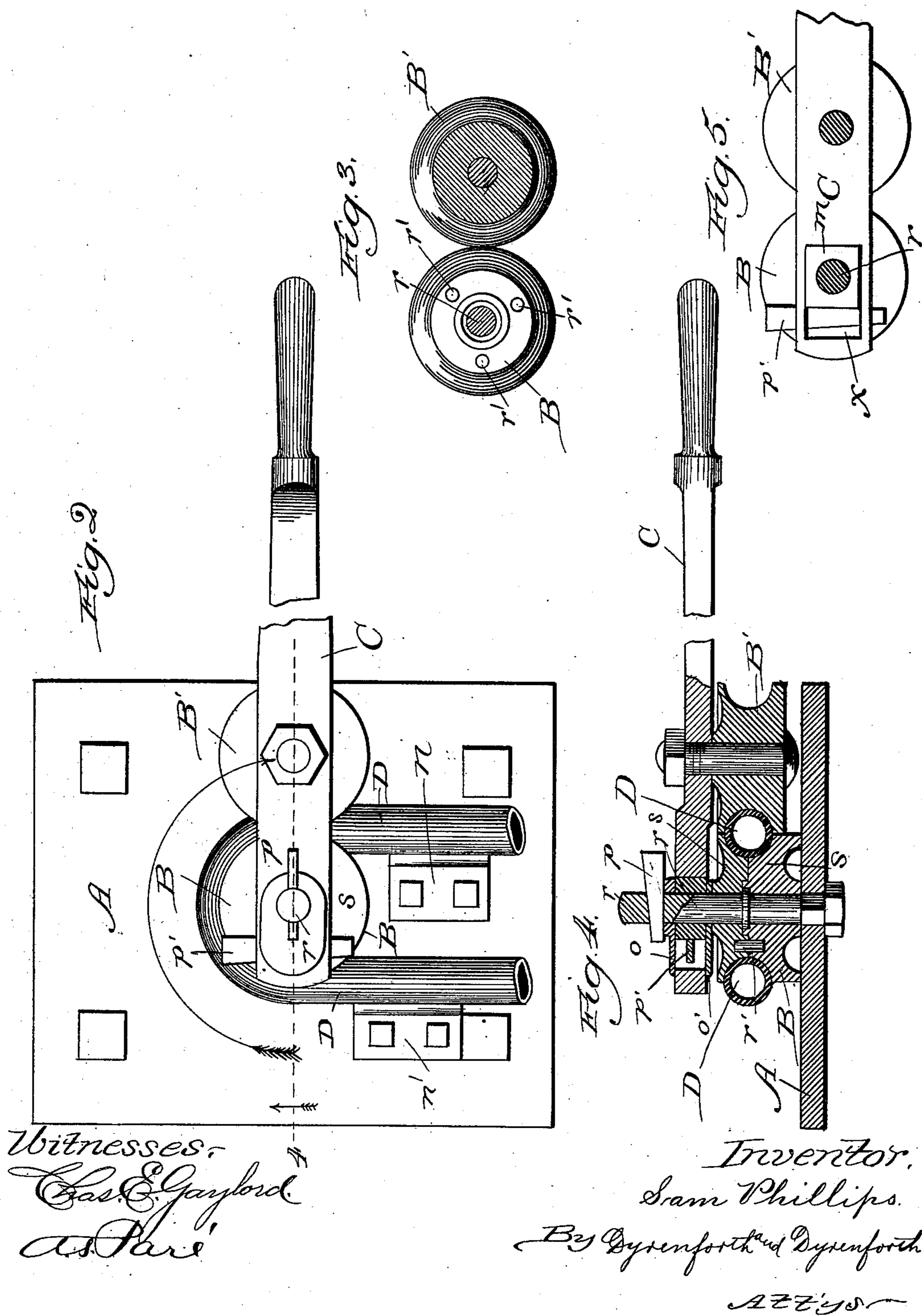
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UNITED STATES PATENT OFFICE.

SAM PHILLIPS, OF CHICAGO, ILLINOIS.

MACHINE FOR BENDING PIPE.

SPECIFICATION forming part of Letters Patent No. 370,652, dated September 27, 1887.

Application filed May 21, 1886. Renewed August 9, 1887. Serial No. 246,506. (No model.)

To all whom it may concern:

Be it known that I, SAM PHILLIPS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Machine for Bending Pipe; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a machine for bending straight piping into parallel lengths to form flat coils for the various purposes for which such contrivances are used, and particularly for use in connection with ice-machines.

A common construction of machine hitherto employed in producing coiled pipe of the above-mentioned description contains a stationary round tapering casting, around which the pipe is bent by means of an adjacent movable grooved roll, between which and the tapering casting the pipe is extended and bent by forcing the movable roll, attached to a lever suitably fulcrumed, about the casting.

The object of the tapering form of the stationary casting is to afford means whereby a section when bent may readily be removed or lifted from it to permit the operation of bending to be performed upon another section. The tapering shape of the casting is found by experience to be objectionable, inasmuch as it tends to produce a flattening effect upon the surface of the tube adjacent to it, owing to the difference in its diameter at adjacent points and the consequent difficulty of causing the pipe to fit snugly upon it while being bent.

It is my object to provide a machine which shall avoid the aforesaid difficulty and by means of which the bending of different or succeeding lengths of pipe may be accomplished more rapidly than has hitherto been possible with the machinery employed for the purpose.

To this end my invention consists in providing, in lieu of the tapering casting referred to, a stationary roll in two readily-separable parts.

It further consists in the general construction of the machine; and it also consists in certain details of construction and combinations of parts, all as hereinafter more fully set forth.

Referring to the drawings, Figure 1 is a plan view of my entire machine, showing a turntable provided with a diametrical support or guide for the piping to be bent and extending at opposite ends beyond the turn-table, where it carries the bending-rolls. Fig. 2 is a similar view of the bending-rolls, the stationary one being of my improved construction, upon a bed-plate, the device comprising a portion of the entire machine shown in Fig. 1 and affording a modification for use in bending pipe of a comparatively short length and readily handled, owing to its shortness; Fig. 3, a sectional view of the rolls; Fig. 4, a sectional view of the machine shown in Fig. 2, and taken on the line 4 4 of the same; and Fig. 5, a view showing details of construction.

A is a bed-plate supporting, preferably at its center, a roll, B, grooved around its periphery and formed in two circular parts, *s* and *s'*, connected together by means of a bolt, *r*, flanged, as shown, toward its center, extending through the bed-plate and about which the roll rotates, and having re-enforcing pins *r'*, extending from the lower section into sockets provided to receive them in the upper section. The bolt *r* affords a pivot for the lever C, which is revolved upon it and carries on its lower surface a roll, B', grooved on its periphery in a manner to coincide, as to the groove, with the roll B, and preferably of the same diameter as the latter. The parts *s* and *s'* of the roll B are firmly secured together by means of a cotter, *p*, driven through the projecting end of the bolt *r*, which is slotted to receive it, and thereby pressing the end of the lever upon the roll, suitable washers, *o* and *o'*, intervening, respectively, between the section *s* of the roll and under surface of the lever and between the upper surface of the latter and cotter *p*.

Fig. 2 represents a section of pipe, D, as already bent. To produce this result, the roll B' was on the side of its companion B opposite to that shown, and the pipe was inserted between them through the opening afforded by the contiguous grooves, in which it fits snugly, but not tightly, and caused to project beyond the rolls to the necessary extent to produce a bent section of desired length. To insure parallel positions of the legs of the bent

sections, guides n and n' are provided on the bed-plate. The bend is produced by turning the lever C toward the position shown in Fig. 2, which presses the roll B' against the projecting end of the pipe and bends it around the roll B to the shape illustrated.

The end of the lever C, opposite the handle portion thereof, is slotted, as shown at x , and contains a shifting block, m , through which the upper end of the bolt r extends, and a cotter, p' , is wedged into the slot x between the end of the lever C and adjacent side of the block m to adjust the lever and its roll B' securely in operative position.

By removing the cotters p and p' (a single stroke with a mallet is sufficient to accomplish their displacement) the lever C may be drawn backward to remove the roll B' from contact with the roll B and pipe D, and then lifted off, thereby freeing the section of roll, s , which may be readily removed to permit the pipe D to be freed from the roll B preparatory to the adjustment of another section to be bent. The operation of separating the parts as above described is readily and rapidly accomplished and their readjustment for bending a succeeding pipe or section of pipe is as readily performed.

The device illustrated in Fig. 1 is for use in producing continuous coils from lengths of pipe of too great extent—several hundred feet—to permit them to be readily handled. It comprises a turn-table, E, of common construction, having a diametrical support or guide, F, for the piping, the ends of which extend beyond opposite edges of the turn-table and support each a device like that shown in Fig. 2, and which is bolted in position. The machine occupies a place in the factory, and the piping D' is led to it through the entrance, means for heating and joining together the various lengths to form a continuous pipe being commonly provided either within or without the factory or operating-room.

Each bend is produced upon a length of piping equal to the distance between the two bending devices, which may be adjusted toward and from each other, means being provided for that purpose in the form of holes l for the bolts l' in the part F or extensions F' thereof. If the latter are provided, as shown, and the bending operation is performed by revolving the turn-table in one direction, and at the same time working the proper lever C to insure a smooth and even bend, then removing the sections of roll, s , in the manner already described, to permit the bent section of pipe D to be released and moved ahead the necessary distance to produce another bent section of equal length with the first named, which is bent by revolving the turn-table in the opposite direction, these operations being continued until the entire length of piping is bent or used up to produce a flat coil of desired extent. The bending devices at opposite sides of the turn-table may, as already stated, be adjusted with relation to each other

to produce coils the bent sections in each of which shall be of different desired lengths.

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

1. In a machine for bending pipe, the combination of a grooved roll, B, formed in two parts, s and s' , secured together and readily separable, and a grooved roll, B', adjacent to the roll B, and to be rotated about the latter, substantially as and for the purpose set forth.

2. In a machine for bending pipe, the combination of a grooved roll, B, formed in two parts, s and s' , secured together and readily separable, a grooved roll, B', adjacent to the roll B, and to be rotated about the latter, and guides n and n' , substantially as and for the purpose set forth.

3. In a machine for bending pipe, the combination of a grooved roll, B, formed in two parts, s and s' , secured together and readily separable, a grooved roll, B', adjacent to the roll B, and a lever, C, carrying the roll B' to rotate it about the adjacent roll, substantially as and for the purpose set forth.

4. In a machine for bending pipe, the combination, with a bed-plate, A, of a grooved roll, B, formed in two parts, s and s' , a bolt, r , extending centrally through the parts s and s' , a lever, C, pivoted upon the bolt, means, substantially as described, upon the projecting end of the bolt and lever to secure the sections of roll together and permit their ready separation, and a grooved roll, B', upon the lever adjacent to the roll B, substantially as and for the purpose set forth.

5. In a machine for bending pipe, the combination, with a bed-plate, A, of a grooved roll, B, formed in two parts, s and s' , a bolt, r , extending centrally through the parts s and s' , a lever, C, pivoted upon the bolt and slotted toward one end to receive a block, m , through which the bolt extends, a cotter, p , in the projecting end of the bolt, washers o o' , a cotter, p' , a grooved roll, B', upon the lever adjacent to the roll B, and guides n and n' upon the base-plate, substantially as and for the purpose set forth.

6. In a machine for bending pipe to produce continuous flat coils, the combination of a turn-table, E, and bending mechanism toward opposite sides of the same, comprising a grooved roll, B, formed in two parts, s and s' , secured together and readily separable, and a grooved roll, B', adjacent to the roll B, and to be rotated about the latter, substantially as and for the purpose set forth.

7. In a machine for bending pipe to produce continuous flat coils, the combination of a turn-table, E, a diametrical support or guide, F, and bending mechanism toward opposite ends of the part F, comprising a grooved roll, B, formed in two parts, s and s' , secured together and readily separable, and a grooved roll, B', adjacent to the roll B, and to be rotated about the latter, substantially as and for the purpose set forth.

8. In a machine for bending pipe to pro-

duce continuous flat coils, the combination of
a turn-table, E, a diametrical support or
guide, F, and bending mechanism toward op-
posite ends of the part F, comprising a grooved
5 roll, B, formed in two parts, *s* and *s'*, secured
together and readily separable, a grooved roll,
B', adjacent to the roll B, a lever, C, carrying

the roll B' to rotate it about the adjacent roll,
the whole being constructed and arranged to
operate substantially as described.

SAM PHILLIPS.

In presence of—

HENRY HUDSON,

J. W. DYRENFORTH.