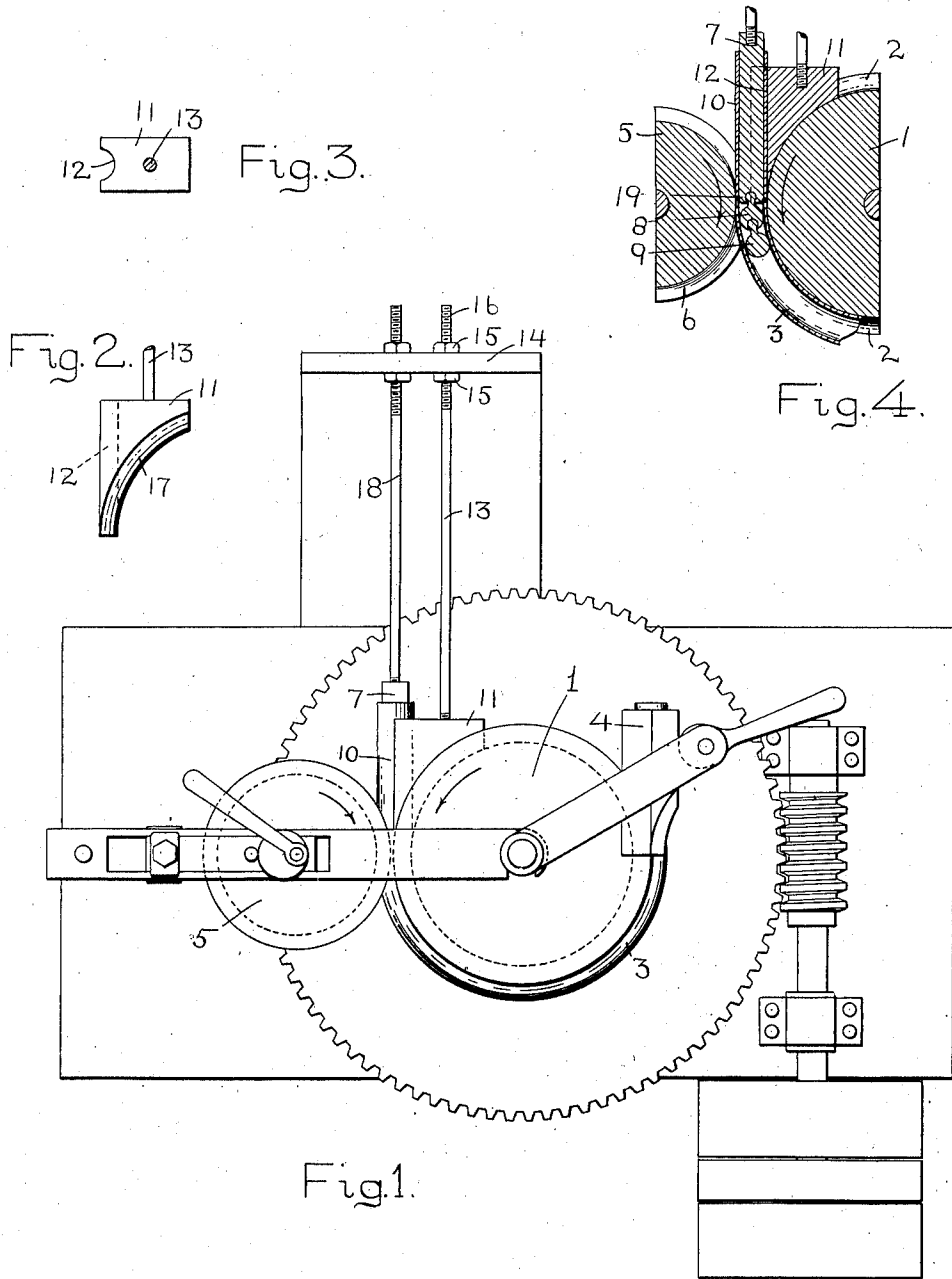


No. 878,604.

PATENTED FEB. 11, 1908.

L. H. BRINKMAN.
MACHINE FOR BENDING PIPE.
APPLICATION FILED JUNE 15, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

LOUIS H. BRINKMAN, OF WEST HARTFORD, CONNECTICUT, ASSIGNOR TO WHITLOCK COIL PIPE COMPANY, OF WEST HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

MACHINE FOR BENDING PIPE.

No. 878,604.

Specification of Letters Patent.

Patented Feb. 11, 1908.

Application filed June 15, 1904. Serial No. 212,688.

To all whom it may concern:

Be it known that I, LOUIS H. BRINKMAN, a citizen of the United States, residing at West Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in a Machine for Bending Pipe, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 is a top view of a pipe bending machine embodying my improvement. Fig. 2 is a detached, top view of a block for resisting the bending strain applied to the pipe. Fig. 3 is an end view of the same, and Fig. 4 is a horizontal sectional view through the forming rolls and through the center of the pipe being bent.

Similar reference letters and figures refer to similar parts in the different views.

My present invention consists in an improvement upon the pipe bending machine described in Letters Patent of the United States, No. 559,839, issued to me May 12, 1896, said machine comprising a pair of grooved bending rolls arranged to rotate in contact with the opposite sides of the pipe to be bent, one of said rolls having a clamping device adapted to seize the pipe and cause it to be wound upon the roll as it rotates, thereby bending the pipe with a curvature corresponding to the periphery of the roll, and my present invention consists in applying to a machine of the class shown and described in said Letters Patent, No. 559,839, a block having a concave face which is held against the side of the pipe immediately back of the bending point, in order to resist the bending strain applied to the pipe as the rolls are rotated.

In the accompanying drawings I have shown in Fig. 1 a top view of a pipe bending machine substantially like that shown in the patent above referred to, in which 1 denotes a rotating forming-roll having a peripheral groove 2, Fig. 4, adapted to fit the pipe 3 to be bent. Carried by the forming-roll 1 is a clamping device 4 adapted to seize the pipe and cause it to be wound around the forming-roll 1 as the latter is rotated. Rotating in conjunction with the forming-roll 1 is a pressure-roll 5 having a corresponding peripheral groove 6 bearing against the opposite sides of the pipe. The pipe 3 to be bent is placed upon a mandrel 7, connected together and to the end of the mandrel 7 by articu-

lated joints, are balls 8 and 9 whose diameter, like that of the mandrel 7, substantially fills the interior of the pipe and prevent the collapsing of the pipe as it is being bent around the forming-roll 1. All the above mentioned parts are, however, substantially like the corresponding parts embodied in the machine described in the patent to me above referred to, and forming no part of my present invention, which consists in inserting between the forming-roll 1 and the straight section 10 of the pipe 3, a supporting block 11 having a concave face 12 adapted to bear against the pipe and prevent any wrinkling of the surface or other distortion of the pipe due to the bending strain as the forming-roll 1 is rotated. The pipe supporting block 11 is carried upon one end of a rod 13, said rod being supported at its opposite end by a fixed framework 14, within which framework the rod 13 is adjustable by means of the nuts 15, 15, carried upon the screw threaded end 16 of the rod. The block 11 is provided with a curved side 17 adapted to fit the peripheral groove 2 of the forming-roll and to fill the triangular space between the forming-roll 1 and the straight section 10 of the pipe 3, and the block 11 is firmly crowded into the space between the pipe and the forming-roll 1 by the adjustment of the nuts 15, 15 on the rod 13, in order to apply sufficient pressure to the pipe to hold it firmly against the mandrel 7 and prevent any wrinkling of the pipe inclosed between the mandrel 7 and the block 11 due to the bending strain applied to the pipe as the forming-roll 1 is rotated. The mandrel 7 is supported upon a rod 18 adjustably held in the frame 14, so that the end 19 of the mandrel will be included within the direct line of pressure between the centers of the rolls 1 and 5, thereby maintaining the mandrel in a fixed position and enabling considerable pressure to be exerted by the block 11 against the straight section 10 of the pipe 3 and toward the mandrel 7, the compression against the pipe being sufficient to prevent any wrinkling of the surface of the pipe back of the point of bending.

In the operation of bending, the inner side of the pipe next the forming-roll is compressed, or upset, at the point of bending, and the outer or diametrically opposite side is stretched. I have found that the pipe, as it is bent, has a tendency to wrinkle or

buckle on the inside of the curve before it reaches the bending point and the upsetting strains in fact extend for some distance behind the point or bending. I resist this tendency to wrinkle or buckle behind the point of bending by compressing a section of the pipe on the inside of the curve behind the point of bending between the block 11 and the mandrel.

10 What I claim as my invention and desire to secure by Letters Patent is:—

1. In a pipe bending machine, the combination with a forming roll around which the pipe is bent, of a block having one angle 15 an acute angle, with one of the sides of said block forming said acute angle in contact with the forming roll and the other side in contact with the pipe to be bent, and means for holding said block in that position while the pipe is being bent.

2. In a pipe bending machine, the combination with a forming roll around which the pipe is bent, of means in contact with said forming roll for exerting pressure on the 25 pipe to be bent immediately behind the bending point, and means for applying a bending strain to said pipe.

3. In a pipe bending machine, the combination with a forming roll around which 30 the pipe is bent, of a block in contact with

the forming roll and in contact with that side of the pipe which is compressed by the bending strain, means for holding said block in said contact with said forming roll and with said pipe, and means for applying a bending strain to the pipe. 35

4. In a pipe bending machine, the combination with a forming roll around which the pipe is bent, of a block in contact with the forming roll and in contact with that 40 side of the pipe to be bent compressed by the bending strain, and means for adjusting said block in a line parallel with the pipe to be bent.

5. The combination with a forming roll 45 and a mandrel, of a supporting block arranged to bear against the pipe to be bent between said forming roll and said mandrel and behind the bending point of said pipe, thereby pressing that side of said pipe 50 against the mandrel, of an adjusting rod carrying said block and means for adjusting said rod in the fixed framework, whereby said block may be pressed against said pipe.

Dated this thirteenth day of June, 1904. 55

LOUIS H. BRINKMAN.

Witnesses:

E. D. REDFIELD,
E. H. TUCKER.