March 30, 1926. 1,578,737

C. J. JOHNSON

BENDING AND STRAIGHTENING MACHINE

Filed July 15, 1924 2 Sheets-Sheet 1

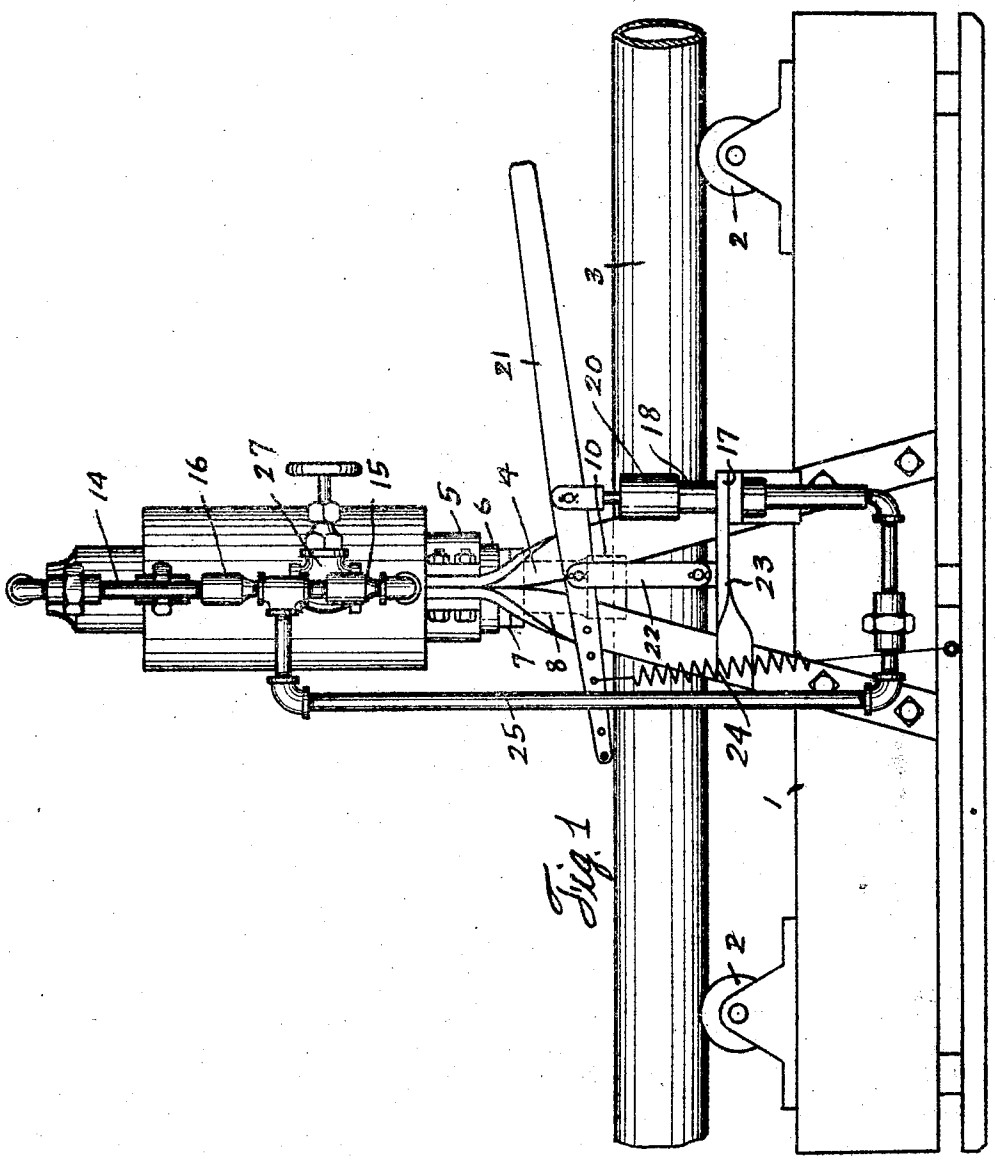


Fig. 1

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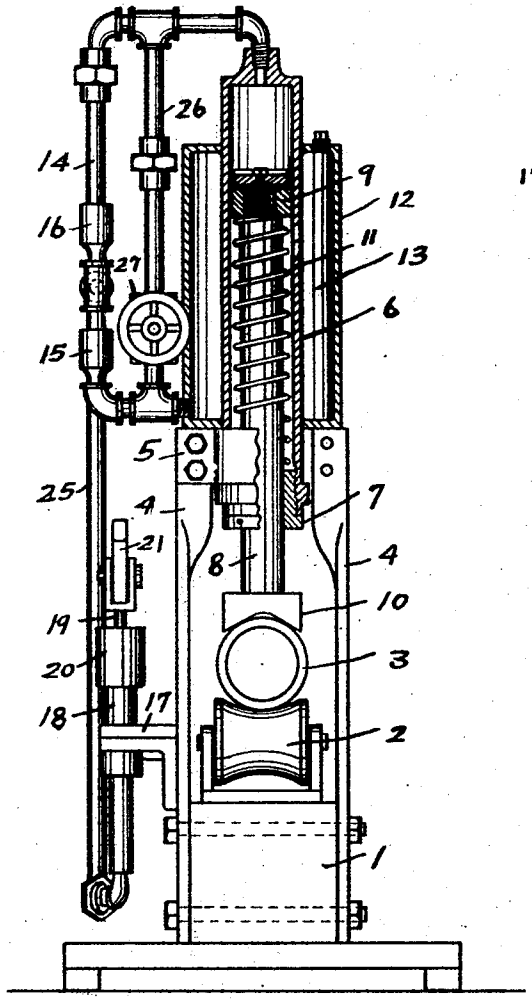


Fig. 2.

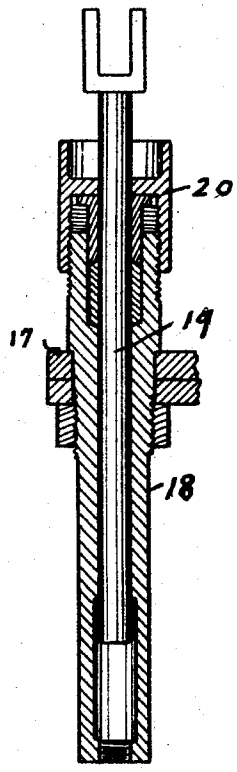


Fig. 3.

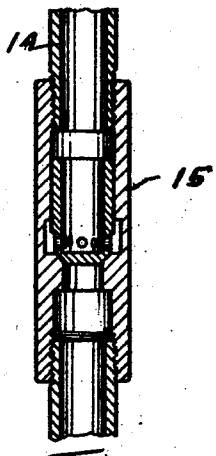


Fig. 4.

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Patented Mar. 30, 1926. 1,578,737

UNITED STATES PATENT OFFICE.

CHARLES J. JOHNSON, OF WICHITA FALLS, TEXAS.

BENDING AND STRAIGHTENING MACHINE.

Application filed July 15, 1924. Serial No. 726,094.

To all whom it may concern:

Be it known that I, CHARLES J. JOHNSON, a citizen of the United States, residing at Wichita Falls, in the county of Wichita and State of Texas, have invented certain new and useful Improvements in Bending and Straightening Machines, of which the following is a specification.

This invention relates to new and useful improvements in a bending and straightening machine.

One object of the invention is to provide a machine of the character described specially designed for the purpose of bending straight pipe, tubing rods, and the like, and which may be also employed for straightening the same.

Another object of the invention is to provide a machine for the purpose specified which utilizes hydraulic pressure and may be either hand or power operated.

With the above and other objects in view, this invention has particular relation to certain novel features of construction, operation, and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 shows a side elevation of the machine;

Fig. 2 shows an end view, partly in section;

Fig. 3 shows a vertical sectional view of a pump employed; and

Fig. 4 shows a vertical sectional view of the valves employed.

Referring now more particularly to the drawings, wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates the base on the respective ends of which are located the grooved pipe receiving rollers 2 adapted to receive and support the pipe 3. These rollers may be adjusted toward and from each other as desired.

Fastened to the sides of the base 1 and upstanding therefrom are the lugs 4, whose upper ends are fastened to the clamp 5 which is clamped around and supports the cylinder 6. This cylinder has a guide sleeve 7 screwed into its lower end through which the plunger rod 8 works. The upper end of this rod carries the usual plunger 9, which works in said cylinder, and the lower end of the rod is formed with a grooved head 10 adapted to work against the pipe 3. Surrounding the rod, within the cylinder 6, and interposed between the guide sleeve 7 and the plunger 9 there is a coil spring 11. Surrounding the cylinder 6 and supported thereby is an oil container 12, which is spaced from said cylinder forming the chamber 13. Leading from the bottom of this chamber and entering the top of the cylinder 6 there is a pressure line 14, equipped with the upwardly opening valves 15 and 16.

There is a pump fastened to a suitable bracket 17 carried by one of the legs 4. This pump consists of the cylinder 18 and the plunger 19 adapted to reciprocate therein. This plunger works through a stuffing box 20 in the upper end of the cylinder and its upper end is pivotally connected to the handle 21. This handle is fulcrumed on the link 22, which is also pivoted on the cross-bar 23 carried by the adjacent leg 4. On the other side of the fulcrum there is a coil spring 24 which is connected at one end to the adjacent leg 4 and at its other end is adjustably connected to said handle.

Leading from the bottom of the pump cylinder 18 there is a line 25 which enters the pressure line 14 between the valves 15 and 16.

On upstroke of the pump plunger 19, oil is drawn out of the chamber 13 passing through the valve 15, and on down stroke of said plunger said oil is forced on through the valve 16 into the cylinder 6. Upon successive up and down strokes of the plunger 19, oil will be drawn out of the chamber 13 and forced into the cylinder 6, thus forcing the plunger 9 downwardly with a corresponding downward pressure of the head 10 against the pipe 3, and also placing the spring 11 under compression. When the pipe 3 is thus brought to the desired contour the pressure in the cylinder 6 is released, and the plunger 9 and plunger rod 8 are lifted by the expansion of said spring 11. In order to release said pressure there is a pipe 26, connected into the line 14 on opposite sides of the valves 15 and 16. This pipe is controlled by the normally closed gate valve 27, and when said valve is opened the pressure of the spring 11 against the plunger 9 will force the oil back from the cylinder 6 into the chamber 13. The handle 21 is usually quite heavy and the pull spring 24 is provided to balance the same so as to relieve the operator on upstroke of the plunger.

What I claim is:—

1. In a machine of the character described, the combination with a base and a pair of adjustable pipe supports spaced apart thereon, of a cylinder associated with the support, a plunger therein, a plunger rod connected at one end to the plunger and whose other end is formed into a pipe-engaging head, a coil spring surrounding said plunger for normally elevating same, a fluid chamber, a valve-controlled pressure line leading from said chamber and entering the cylinder on one side of said piston, a pump connected into said line through which fluid may be forced from said chamber into said cylinder, whereby said head is forced against the pipe on said supports, means for operating said pump, and a valve-controlled relief line connecting said cylinder with said chamber.

2. In a bending and straightening machine, the combination with a base and a pair of pipe supports thereon, of a fluid pressure cylinder mounted on said support, a plunger in said cylinder formed with means adapted to engage against the pipe on said support, a fluid chamber surrounding said cylinder, a pressure line connecting said cylinder and chamber, a pump connected into said line through which fluid may be forced into the cylinder from the chamber to actuate said pipe-engaging means against the pipe, a relief line connecting said cylinder with said chamber through which the pressure may be relieved from the plunger, and means for releasing said pipe engaging means from the pipe.

3. In combination a bending and straightening machine including a base, a pair of pipe supports thereon, a fluid pressure cylinder associated with said support, a plunger in said cylinder formed with means adapted to engage against the pipe on said support, a fluid chamber surrounding said cylinder, a pressure line connecting said cylinder and said chamber, a pump connected into said line through which fluid may be forced into the cylinder from the chamber to actuate said pipe-engaging means against the pipe, a relief line connecting said cylinder with said chamber through which the pressure may be relieved from the plunger, and a spring surrounding said plunger adapted to release said pipe-engaging means from the pipe when the pressure is relieved from said plunger.

In testimony whereof I have signed my name to this specification.

CHARLES J. JOHNSON.