R. L. DAVIS & G. C. MOYERS.

PIPE BENDING APPARATUS.

APPLICATION FILED FEB. 12, 1915.

1,167,983.

Patented Jan. 11, 1916.

2 SHEETS—SHEET 1.

Fig. 1

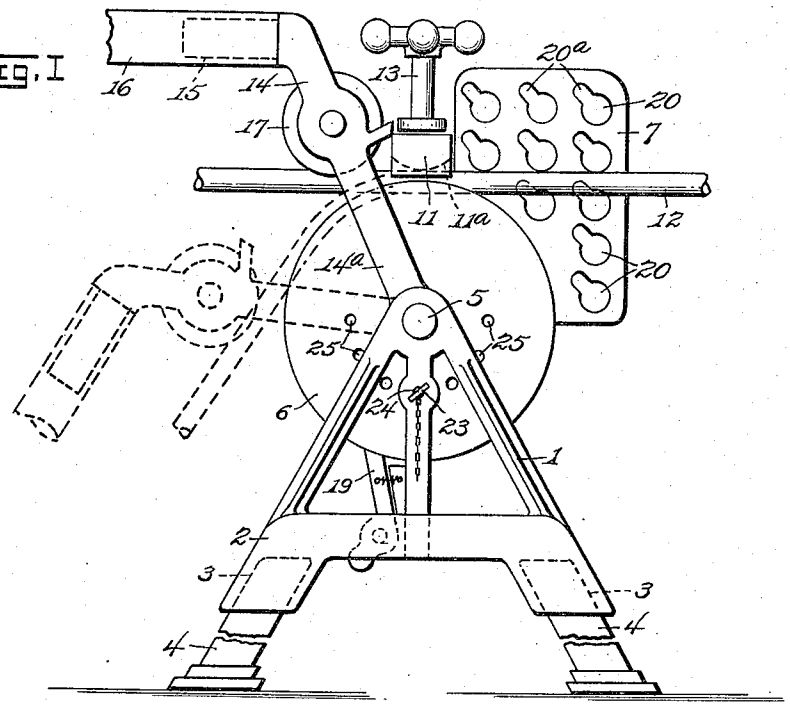
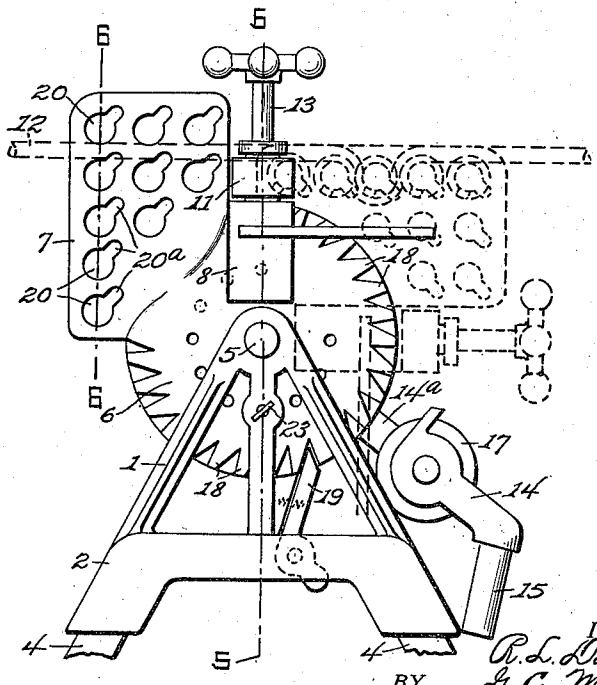


Fig. 2



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2 SHEETS—SHEET 2.

Fig. 3

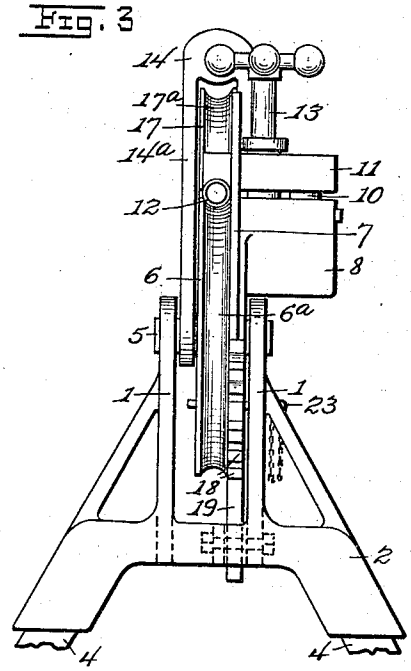


Fig. 4

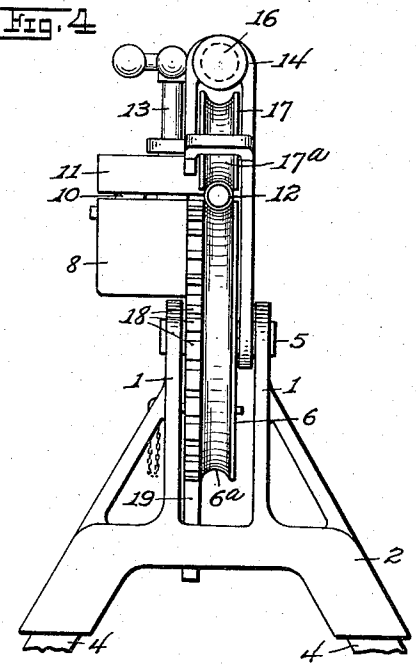


Fig. 5

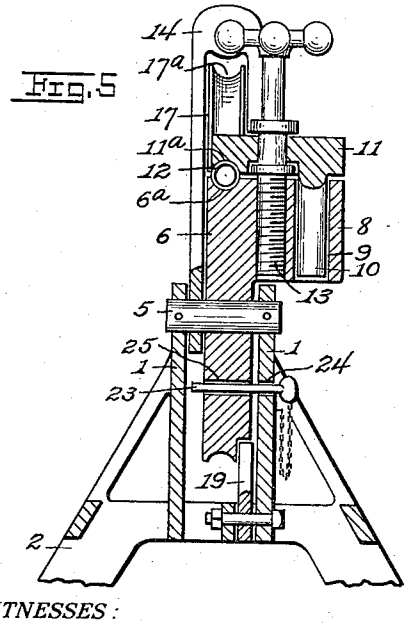
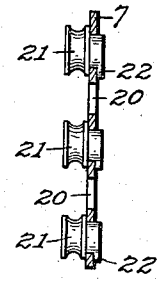


Fig. 6



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UNITED STATES PATENT OFFICE.

RAY L. DAVIS AND GUY C. MOYERS, OF WHEELING, WEST VIRGINIA.

PIPE-BENDING APPARATUS.

1,167,983. Specification of Letters Patent. Patented Jan. 11, 1916.

Application filed February 12, 1915. Serial No. 7,876.

To all whom it may concern:

Be it known that we, RAY L. DAVIS and GUY C. MOYERS, citizens of the United States of America, and residents of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Pipe-Bending Apparatus, of which the following is a specification.

This invention relates broadly to pipe bending devices, and specifically to a machine for producing bends in pipe.

The primary object of the invention is to provide a simple, strong and durable device or machine whereby bends of various forms may be readily formed in pipes, lead cables and the like.

A further object is to provide a machine of the character mentioned which is self-contained, portable and adapted to be used without bolting down or otherwise attaching to a work-bench or fixed support.

With these and other objects in view, the invention resides in the features of construction, arrangement of parts, and combinations of elements which will hereinafter be fully described, reference being had to the acompanying drawings, forming a part of this specification, in which—

Figures 1 and 2 are elevations of opposite sides of the machine; Figs. 3 and 4 are respectively rear and front elevations of the same; and Figs. 5 and 6 are sections taken respectively on the lines 5—6 and 6—6, Fig. 2.

Referring to said drawings, in which like designating characters distinguish like parts throughout the several views—1 indicates the opposite upright side members of a frame 2 which is preferably provided with seats or sockets 3 for the reception of divergently inclined supporting legs 4. Fixed in said side members 1 are the opposite ends of a horizontally disposed shaft 5 upon which, between said members, a wheel 6 is rotatably mounted, said wheel having a circumferential pipe-receiving groove 6^a provided therein. Attached to or formed integral with said wheel and projecting outward from a portion of the periphery of the latter is a plug-board 7 which, in the normal or initial working position of the device, is supported in the upright position shown in Figs. 1 and 2. Said board is also disposed laterally with respect to the pipe-receiving groove 6^a, as is shown in Fig. 3.

Attached to or formed integral with the wheel 6 is a laterally disposed bearing block 8 having a bore 9 therein, which, in the normal or initial working position of the wheel, extends vertically through said block. Mounted in said bore 9 is a stem or guide member 10 formed on a head-piece 11 which overlies and is vertically movable with respect to said block 8 and the adjacent portion of the periphery of wheel 6 for rigidly holding a pipe, as 12, interposed between it and said wheel, said head-piece having in its wheel-overlying portion a groove or channel 11^a adapted to accommodate the adjacent face of the interposed pipe. Said head-piece is mounted upon and has swivel-like connection with an adjusting screw 13 which is threaded vertically into the bearing block 8, as is clearly shown in Fig. 5.

Loosely mounted upon the shaft 5 is an arm 14^a constituted by an extension of one of the parallel members of a yoke 14 which has a portion, as a stem 15, adapted for the reception of a rod or lever 16. Rotatably mounted between the parallel members of said yoke is a wheel 17 having a circumferential groove 17^a therein corresponding to the groove 6^a in wheel 6. Said wheel 17 is supported in a position adjacent to the periphery of said wheel 6 and is adapted to ride, during the bending operation, upon the pipe 12 held in the vise-like grip of the head-piece 11 and said wheel 6.

Formed on the periphery of the wheel 6 laterally of the groove 6^a thereof is a plurality of ratchet teeth 18 adapted to be engaged by a spring-held pawl 19 which is pivotally mounted at a suitable point, as on the frame 2. Said pawl serves to maintain the wheel 6 against rotation when the lever 16 is drawn downward in the pipe-bending operation.

Provided in the plug-board 7 is a plurality of suitably arranged openings 20 adapted for receiving therein the stem portions of removable plugs 21 the bodies of which are circumferentially grooved, as shown in Fig. 6, and over or about which a pipe may be turned by hand for producing a great variety of short or abrupt bends, said plugs being first disposed in said openings 20 in proper relation. Each of said plugs has a short laterally directed wing or tenon 22 formed on the end of the stem thereof whereby it is retained against chance

dislodgment when inserted in an opening 20, and each opening 20 has a laterally directed slot 20^a communicating therewith through which said wing is directed. After insertion, the plug is given a partial turn to carry said wing out of register with said slot 20^a, as will be readily understood. To produce a long or gradual bend in a pipe, the latter is inserted between the head-piece 11 and the wheel 6 and between the wheel 17 and said wheel 6; and said head-piece is adjusted into binding relation to said pipe, the latter having been first disposed so that the point gripped by the head-piece is the point from which the bend shall begin. The lever 16 is then drawn downward, causing the parts to assume substantially the positions indicated in dotted lines in Fig. 1, and this action carries the pipe to substantially the position indicated by dotted lines in said figure, the same being bent over the periphery of the wheel 6. As is obvious, the wheel 6 may be preliminarily rotated to any preferred position; then, after producing a bend which utilizes the limit of the throw of the lever 16, said wheel may be rotated forward a suitable distance and the lever again depressed for producing a bend of still greater length.

While the pawl and ratchet connection hereinbefore described will ordinarily suffice for holding the wheel 6 in any position to which it may be rotated, we may additionally employ a pin or key 23, the same being directed through a hole 24 in the frame and into one of a plurality of holes 25 provided in said wheel 6, as is most clearly shown in Fig. 5.

All of the parts mounted on the shaft 5 may be swung to the position shown in dotted lines in Fig. 2, as when the coöperation of the head-piece 11 is not required and the bending is to be performed over the plugs by hand.

What is claimed is—

1. A pipe bending apparatus comprising a support, a wheel rotatably mounted on said support, a ratchet in fixed relation to said wheel, a pawl normally engaging said ratchet, means for clamping a pipe against the periphery of said wheel, and means mounted on the axis of said wheel and adapted for movement adjacent to the periphery of the latter whereby the pipe is bent about said periphery.

2. A pipe bending apparatus comprising a support, a wheel rotatably mounted on said support, means for clamping a pipe against the periphery of said wheel, a ratchet in fixed relation to said wheel, a pawl normally engaging said ratchet, and a lever-operated wheel adapted to be rotated adjacent to the periphery of the first-mentioned wheel for bending the pipe about the latter.

3. A pipe bending apparatus comprising a support, a wheel rotatably mounted on said support, a ratchet in fixed relation to said wheel, a pawl normally engaging said ratchet, a yoke having pivotal relation to the axis of said wheel, a wheel rotatably mounted in said yoke and located in opposing relation to and at a spaced distance from the periphery of the first mentioned wheel, means for clamping a pipe against the periphery of said first mentioned wheel, and means for swinging said yoke downward for bending over said periphery a pipe secured by said clamping means and interposed between said wheels.

4. A pipe bending apparatus comprising a support, a wheel rotatably mounted on said support, a ratchet in fixed relation to said wheel, a pawl normally engaging said ratchet, a yoke having a pivotal relation to the axis of said wheel, a wheel rotatably mounted in said yoke and located in opposing relation to and at a spaced distance from the periphery of the first mentioned wheel, a bearing block carried by said first-mentioned wheel, a head-piece mounted over said bearing block, means for adjusting said head-piece for clamping a pipe against the periphery of said first mentioned wheel, and means for swinging the yoke downward for bending a pipe interposed between said wheels and secured by the clamping mechanism.

5. A pipe bending apparatus comprising a support, a wheel rotatably mounted on said support, a ratchet in fixed relation to said wheel, a pawl normally engaging said ratchet, a yoke having a pivotal relation to the axis of said wheel, a wheel rotatably mounted in said yoke and located in opposing relation to and at a spaced distance from the periphery of the first mentioned wheel, a bearing block carried by said first-mentioned wheel, an adjusting screw mounted in said bearing block, a head-piece disposed in overlying relation to the first-mentioned wheel and mounted in swiveled relation to said adjusting screw, said block being adapted to clamp a pipe interposed between said wheels in rigid relation to the first mentioned wheel, and hand operated means for lowering the yoke-carried wheel for bending the pipe over the periphery of the first mentioned wheel.

In testimony whereof we affix our signatures in presence of two witnesses.

RAY L. DAVIS.
GUY C. MOYERS.

Witnesses:
H. E. DUNLAP,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."