A. O. JAMETON.

BAR BENDING APPLIANCE.

APPLICATION FILED MAY 7, 1915. RENEWED OCT. 9, 1916.

1,206,114.

Patented Nov. 28, 1916.

2 SHEETS—SHEET 1.

FIG. 1.

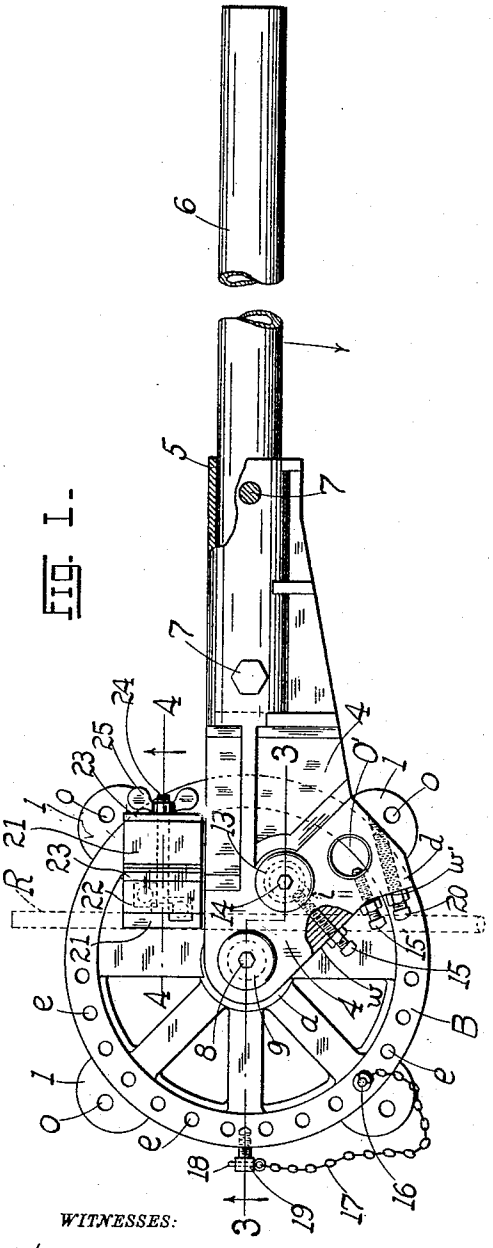
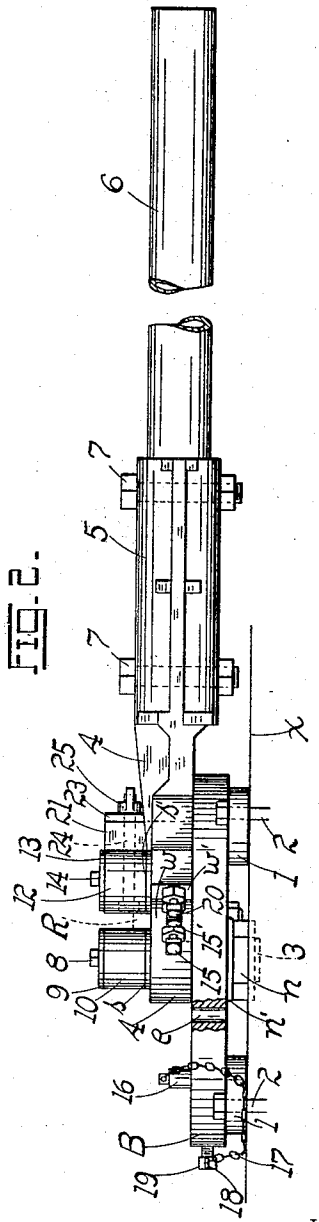


FIG. 2.



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2 SHEETS—SHEET 2.

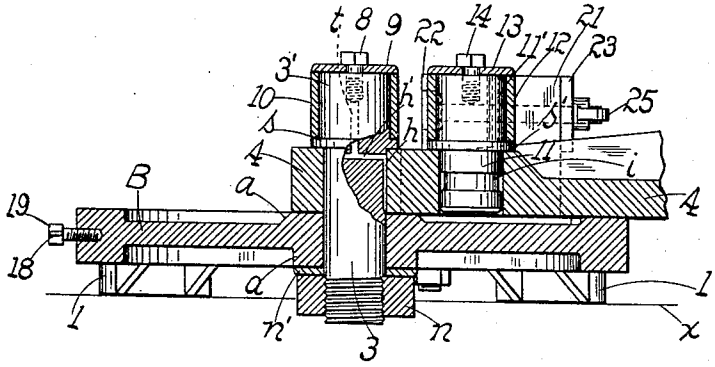


FIG. 3.

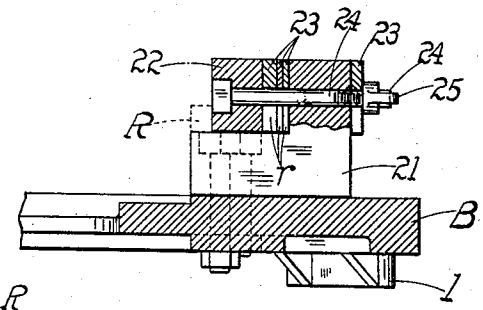


FIG. 4.

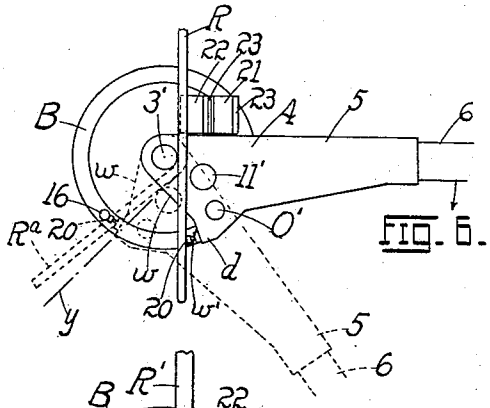


FIG. 6.

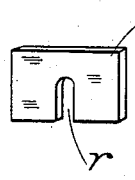


FIG. 5.



FIG. 8.

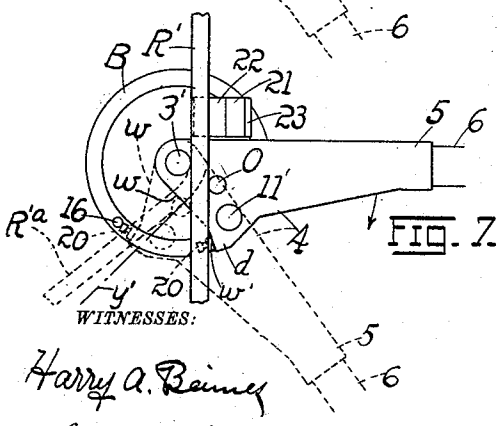


FIG. 7.

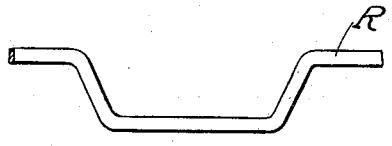


FIG. 9.

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BAR-BENDING APPLIANCE.

1,206,114. Specification of Letters Patent. Patented Nov. 28, 1916.

Application filed May 7, 1915, Serial No. 26,519. Renewed October 9, 1916. Serial No. 124,686.

To all whom it may concern:

Be it known that I, ADRIAN O. JAMETON, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Bar-Bending Appliances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in bar-bending appliances; and it consists in the novel features of construction more fully set forth in the specification and pointed out in the claims.

The present invention is directed to appliances or devices for putting bends in bars or rods entering into the construction of reinforced concrete, or which form elements or members of architectural and engineering structures generally, the object sought being to provide a bending appliance which can operate quickly on the member to be bent; one which is simple in construction; one possessing a maximum amount of leverage; one readily manipulated; one adapted to accommodate any required number of operators according to the power to be applied; one which shall bend the bar or rod at any angle; one accommodating variable thicknesses or cross-sections of rods; and one possessing further advantages better apparent from a detailed description of the invention, in connection with the accompanying drawings, in which—

Figure 1 is a top plan of my improved bender, the handle lever being shown broken; Fig. 2 is a front elevation thereof with parts partly broken; Fig. 3 is a vertical longitudinal section on the zig-zag line 3—3 of Fig. 1; Fig. 4 is a vertical longitudinal section on the line 4—4 of Fig. 1; Fig. 5 is a perspective of one of the filler pieces; Figs. 6 and 7 are diagrammatic plan views showing the application of the bender to two different sizes of bar; and Figs. 8 and 9 are plans of two different sizes of bars showing corresponding bends.

Referring to the drawings, B represents a suitable circular base or spoked ring provided with marginal lugs or feet 1, through the openings *o* of which are passed bolts 2 for securing the base to any suitable support, the lugs serving to space or raise the base B a suitable distance above the plane of the surface supporting the lugs, said plane being indicated herein by the line *x*. The fixed support may be a frame composed of timbers, or any member to which the lugs or feet 1 may be conveniently bolted or secured. Traversing the central hub *a* of the base or ring B, is a fulcrum pin 3, the lower terminal being threaded and receiving a tightening nut *n*, a washer *n'* being interposed between the nut and the bottom of the hub (Fig. 3). The upper end of the fulcrum pin terminates in a head or enlargement 3' at the base of which is formed an offset or annular shoulder *s*. The fulcrum pin passes loosely through one end of the oscillating member or casting 4, said member being provided with a socket 5 for receiving the handle or lever 6. To all intents and purposes however the parts 4, 5, 6, may be jointly considered as the operating lever, the handle 6 proper being detachable from its socket, and when once inserted thereinto may be secured in place by bolts 7 or other suitable mechanical manner. The member 4 may be considered as the base of the operating lever, the same resting on the upper terminal of the hub *a*, on which it freely plays, the rubbing surfaces being kept lubricated by oil or lubricant delivered thereto through the oil grooves *h* leading from the terminals of a transverse port *h'* with which the fulcrum pin is provided, the port *h'* being in turn supplied from the central oil passage *t* to which lubricant is initially supplied through the top of the pin, the top of the passage *t* being subsequently closed by a screw plug 8 which at the same time serves to secure the terminal disk or cap-plate 9, between which and the shoulder *s* a sleeve or shell 10 surrounding the head 3' is confined. The shoulder or ledge *s* thus serves not only to arrest the drop of the pin 3 through the fulcrum opening in the lever-base 4 (the latter being confined between said shoulder and the hub *a*), but as a means of supporting the sleeve or shell 10.

Disposed in the lever base 4, adjacent the fulcrumed end thereof, and to one side of the longitudinal axis of the handle 6, and on lines radiating from the axis of oscillation of the operating lever (said axis being coincident with the axis of the fulcrum pin 3), are openings or sockets O, O', respectively, the opening O' being removed radially the greater distance from the fulcrum pin, and the opening O being substantially midway between said pin and the opening

O'. The openings O, O', are disposed in proximity to the basal inclined wall *w* of the operating lever, the outer end of said wall terminating at the bottom wall *w'* of a heel *d* formed at the widest portion of the member 4, the wall *w'* forming an obtuse angle with the wall *w*. Either of the openings O, O', is adapted to receive a cylindrical stud 11 provided with an outer terminal head 11' at the base of which is formed an annular collar or shoulder *s'* resting on the member 4, said head having passed thereover a shell 12 capped by a disk or plate 13 secured by a screw 14, the shell resting on the shoulder or ledge *s'* (Fig. 3). The reduced portion of the stud is provided with an annular groove *i* which receives the inner end of a screw-bolt 15 passed through the wall *w* of the base 4 in proper direction to enter the opening O for engaging said groove, whereby the stud is held against accidental displacement. A similar screw-bolt 15' is provided for entering the opening O' to engage the stud when the latter is transferred to said last mentioned opening.

Distributed circularly on the base or ring B in the path of oscillation of the heel *d* are a series of holes *e* into any of which may be dropped a headed pin 16 fastened to one end of a chain 17 whose opposite end is provided with an eye-bolt 18 insertible into the head of an anchor-bolt 19 disposed on the periphery of the base B. The head of the pin 16 projects above the base when said pin is dropped into an opening *e*, said head being adapted to foul or strike the head of an adjusting bolt 20 leading from the basal wall *w'* of the heel *d*. In other words, the holes *e* and the pin 16 projecting therefrom are disposed in the path of sweep of the heel *d* and the bolt 20 carried thereby. It will thus be seen that by dropping the pin 16 first into one hole *e* and then another, we can regulate the angle of sweep of the operating lever, the latter being arrested whenever the bolt 20 strikes the pin 16.

Bolted or otherwise secured to the base B on that side of the operating lever which is opposite the heel *d* (and which for convenience we can designate as the rear side) is an angle-block or abutment 21. The position of this block is such that when the member 4 is swung up to it (said block limiting the backward stroke of the operating lever) the longitudinal axis of the handle 6 will be parallel to the side wall of the block, and at right angles to the terminal wall of the horizontal leg thereof (Fig. 1). The upper surface of said horizontal leg forms a rest or support for the rod or bar R, R', to be bent, the width of the surface affording such support being adjusted to the size of the bar or rod by a fulcrum block 22 resting on the horizontal leg and adjustable thereon by the application of suitable filler pieces 23 interposed between the member 22 and the vertical leg of the block 21, the fillers being provided with recesses *r* for straddling the bolt 24 by which the member 22 is secured to the angle-block, the parts when once properly adjusted being clamped together by the wing nut 25 at the opposite end of the bolt, any filler not required between the member 22 and the block 21, being lifted out and placed between the nut 25 and block 21.

The operation of the bender is substantially as follows: The upper face of the member 4 at points adjacent the fulcrum pin 3 is substantially horizontal and disposed in the plane of the upper surface of the horizontal leg of the abutment or block 21, so that when the operating lever is swung to its normal position (that is to say against the abutment as shown in Fig. 1) the horizontal surfaces of the members 4 and 21 referred to, form a support or rest for the rod or bar R or other member to be bent, the rod lying across the horizontal leg of the abutment and between the head of the fulcrum pin 3 and the stud 11 deposited in one of the holes O, O', (see dotted position Fig. 1, and Figs. 6, 7). The member to be bent is thus disposed substantially at right angles to the longitudinal axis of the operating lever, the pin 3 and stud 11 engaging the member from opposite sides. If the rod or bar is small in cross-section, and a short bend therein is desired, the operator deposits the stud 11 into the opening O, or that nearer the fulcrum pin (Fig. 6). If now we swing the operating lever away from the abutment 21, or in the direction indicated by the arrows in Figs. 1, 6, 7, it will be seen that a bend will be formed in the rod about the head 3' of the fulcrum pin 3, the head 11' of the stud 11 being the member by which the power is applied to the rod, the head 3' being the point of resistance, and the block 22 against which the rod is braced, serving as a fulcrum point. The angle to which the rod is bent will depend on the position of the stop pin 16, and the adjustment imposed on the adjusting bolt 20, these being so regulated that when the pin 16 strikes the head of the bolt 20, the arc through which the lever has been swung is slightly in excess of the angle of the desired bend, this excess being in the majority of cases necessary on account of the spring of the metal, which, after the release of the bent portion, causes said portion to spring back to the angle desired. Thus, in Fig. 6, the lever is swung until the bar is bent to the dotted position R^a which is slightly in excess of the degree to form the angle desired, but after the bent portion is released by a swing of the operating lever toward normal position, the metal will spring back somewhat say to the position indicated by the line *y*, this being the angle desired. Again, in bending a

heavier bar such as R′, the operator shifts the stud 11 from the opening O to O′, adjusts the block 22 to accommodate such larger bar, the same operations as previously described being resorted to. In Fig. 7 a bar such as the bar R′ is being bent, the dotted representation R′ª indicating the point of initial bend, after which the member springs back to the line *y′* which gives the desired angle.

It will be seen that the bolts 15, 15′, 20, are all disposed below the plane of the bar supporting surface of the member 4, so that the bar to be bent is out of the way of these bolts. In the bending operation the sleeves 10 and 12 serve to protect the heads 3′ and 11′ of the pin 3 and stud 11 respectively, and as one sleeve wears out another may be substituted. Obviously any number of bends and at any angle may be formed in a bar or rod or other member, the illustrations Figs. 8, 9, serving as single examples. The inclination of the basal wall *w′* of the heel *d* is important, as it permits the bolt 20 to be passed at right angles to the plane of said wall, and at the same time be so disposed as to cause the head thereof to strike squarely or with its butt end, against the pin 16, thereby insuring against any lateral strains on the bolt. To accomplish this result the wall *w′* should be substantially radial with the sweep of the operating lever. The feet or lugs 1 serve to raise the base or ring B sufficiently above the surface *x* of the timbers or frame to which the legs are bolted, to permit dirt, scales and the like which may flake off from the bars being bent, to fall through the holes *e*. If the bottoms of the holes rested on the timbers, the holes would soon fill up with dirt and foreign material, and thus prevent the free insertions of the pin 16.

Having described my invention what I claim is:

1. In a bending appliance, a stationary base, an oscillating lever pivoted thereto and supporting the bar to be bent, a fulcrum pin disposed about the axis of oscillation of the lever and projecting above the bar-supporting surface thereof, for engaging the bar from one side, a stud on the lever removed a suitable distance from the axis of oscillation thereof for engaging the bar from the opposite side, means on the lever permitting the positioning of the stud at varying distances from said axis, a movable stop pin adapted to be secured to the base at any desired point in the path of sweep of the lever during the bending operation, an adjustable member on the lever adapted to strike said pin for arresting the lever at a point to produce any predetermined angle of bend in the bar, an abutment on the base for limiting the sweep of the lever toward normal position, and means on the abutment for fulcruming the bar during the bending operation.

2. In a bending appliance for bars, a suitable base, an operating lever pivoted thereto, the base being provided with a series of circularly disposed openings, a pin adapted to be dropped into any one of said openings, an adjustable member on the lever for impinging against said pin with a sweep of the lever in a direction to bend the bar, a fulcrum pin disposed about the oscillation axis of the lever for engaging the bar to be bent on one side, an adjustable stud removed from said axis for engaging the bar from the opposite side when the bar is resting on the lever, an abutment on the base for arresting the lever in its sweep to normal position, the abutment being provided with a supporting surface for the bar to be bent, and a fulcrum block on said abutment against which the bar may bear during the bending operation.

3. In a bending appliance of the character described, an operating bending lever pivoted about a fixed axis, a heel formation on the lever removed from said axis, the heel having a basal wall disposed radially to the path of sweep of the heel, an adjusting bolt on the heel disposed substantially at right angles to the radial wall, and a stop pin cooperating with said adjusting bolt.

In testimony whereof I affix my signature, in presence of two witnesses.

ADRIAN O. JAMETON.

Witnesses:
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W. A. BAITY.

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