

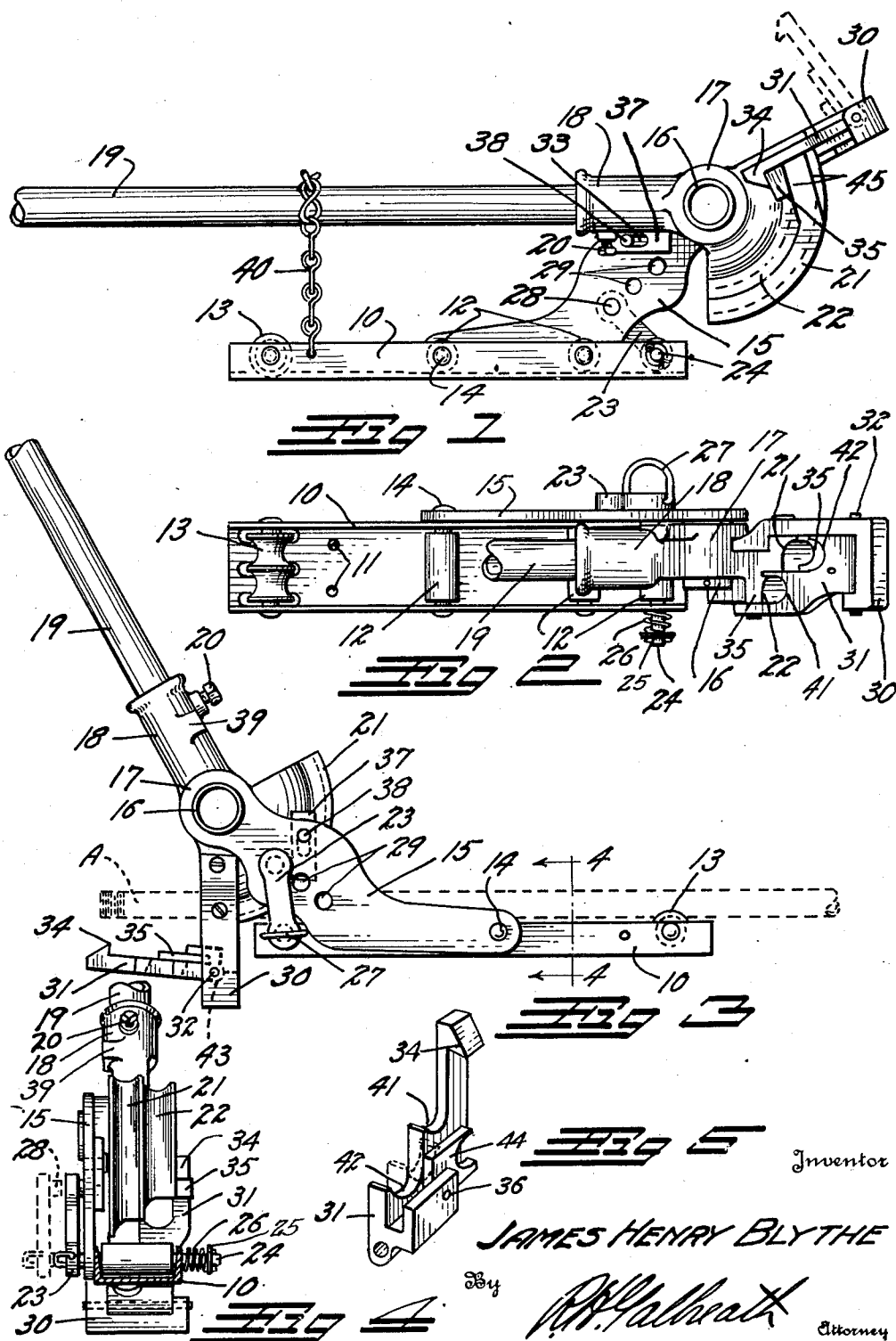
Dec. 8, 1931.

J. H. BLYTHE

1,835,264

PIPE BENDING TOOL

Filed Aug. 21, 1930



UNITED STATES PATENT OFFICE

JAMES HENRY BLYTHE, OF DENVER, COLORADO

PIPE BENDING TOOL

Application filed August 21, 1930. Serial No. 476,751.

This invention relates to a device for bending pipe and is more particularly adaptable to the use of electricians in bending and shaping electric conduit. The principal object of the invention is to provide a simple, efficient, and easily operated device which will be light in weight, easily transportable to the job, and which can be secured upon any convenient board, beam, or work bench.

Other objects of the invention are:

To provide adjustments for accommodating the most used diameters or sizes of conduits;

To provide an adjustable stop so that the device will be automatically stopped when it has formed a 90° bend;

To provide a simple and positive locking mechanism for locking the conduit against the bending sector;

To so construct the locking mechanism that it will accommodate various diameters of conduit;

To provide a double bending sector so that the conduit may be bent to either of two radii; and

To so construct the device that the bent conduits may be placed in position or removed through the side of the bending sector so as to make it unnecessary to draw the entire conduit through the device.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

Fig. 1 is a right side elevation of the device illustrating it in the closed position for carrying or transporting.

Fig. 2 is a plan view thereof.

Fig. 3 is a left side elevation illustrating the handle and locking device in position ready to receive a conduit, or pipe to be bent.

Fig. 4 is a cross section taken on the line 4—4 Fig. 3.

Fig. 5 is a detail perspective view of the locking plate.

The invention comprises a base channel 10 provided with suitable openings 11 by means of which it may be secured to any suitable supporting surface. The conduit to be bent is supported within the base channel 10 upon a series of flat rollers 12 and a grooved roller 13. One of the rollers 12 is mounted upon a roller shaft 14 upon the extremity of which a bracket arm 15 is hinged. The arm 15 supports at its upper extremity a bearing shaft or tube 16 upon which, is mounted a sector casting 17.

The casting 17 is provided with a handle socket 18, in which a suitable handle 19 of any desired length is secured by means of a suitable set screw 20. As illustrated the casting 17 carries a large bending sector 21 and a small bending sector 22. A grooved track is formed on each of the sectors 21 and 22 to conform to the exterior surface of the conduit.

The free extremity of the arm 15 is supported at any desired height by means of a link 23. The link 23 is mounted on the extremity of a shaft 24 that passes through the flanges of the base channel 10 and forms a bearing shaft for one of the rollers 12. The shaft 24 extends through the opposite side of the base channel terminating in a bearing washer 25 against which a compression spring 26 acts to constantly pull the link 23 inwardly. A finger bail 27 is provided by means of which the link may be pulled outwardly. The free extremity of the link 23 carries a stud 28 which may be placed in any desired one of a series of stud holes 29 in the arm 15.

A bracket 30 extends outwardly at one extremity of the sectors. A locking plate 31 is carried by the bracket 30 upon a pivot shaft 32. The locking plate 31 is provided with notches 41 and 42, which co-act with the grooves in the sectors 22 and 21 respectively to lock or hold the conduit there against. The plate 31 is provided with a hooked extremity 34 which, when in the closed position, passes over a projection 35 upon the casting

17 to prevent the bracket 30 from being bent or being forced outwardly by the reaction of the conduit being bent.

A notched adaptor block 44 is provided, which is pivoted upon a pin 36 in the plate 31. The block 44 can be swung into and out of position in the notch 42 to reduce the diameter thereof so as to clamp a smaller diameter conduit.

It is desirable to have some means for limiting the possible length of the stroke of the handle at times so as to form exact 90° bends. This is accomplished by means of an adjustable stop 37 which is slidably mounted upon a supporting pin 38 on the inner face of the arm 15 and which contacts with a stop lug 39 upon the handle socket 18.

The stop 37 contains a slotted opening 33, that allows it to slide upon the pin 38. The slotted opening is not positioned in the exact longitudinal center of the stop so that the handle can be stopped at two different points by turning alternate extremities of the stop 37 upward.

Let us assume that it is desired to form a small radius bend in a length of conduit. The stud of the link 23 is passed in the upper hole 29, as shown in Fig. 3, to bring the sectors to the lowest position. The conduit is then positioned, as shown in broken line in Fig. 3, and the locking plate is closed so that its upper notch 41 will contact with the conduit. The longer extremity of the stop 37 is turned upwardly as shown in Fig. 3. The handle 19 is now swung downwardly until the lug 39 contacts with the stop 37. This will form a 90° bend in the conduit. The handle is then returned to its former position which will automatically throw the locking plate to the open position of Fig. 3 and release the conduit.

To form a large radius bend in large conduit the link 23 is placed in the lowermost hole 29 to raise the sectors. The conduit is placed under the large sector 21 and the locking plate is closed with the adaptor 44 in the solid line position of Fig. 5. This brings the notch 42 into contact with the conduit securely locking it in place. The stop 37 is reversed end to end so as to bring its shorter extremity uppermost and the handle 39 is closed to contact with the stop.

If a small conduit is to be bent to the large radius the above operation is employed except that the adaptor 44 is swung to the broken line position of Fig. 5 so as to partially close the notch 42 to allow it to grip the smaller conduit and the link 23 is positioned in the middle hole 29 to bring the sectors into proper relation to the base channel.

It is desired to call attention to the fact that when bending, the pull upon the conduit tends to force the locking plate 31 outwardly so as to exert a bending strain upon the bracket 30. This strain, however, is absorbed by

the hooked extremity 34 which engages the projection 35 and prevents the bracket from being forced outwardly. There is also an excessive downward pull upon the locking plate 31 but this is not transmitted to the pivot shaft or pin 32 since the extremity of the locking plate rests in a groove in the bracket 30, shown at 43, Fig. 3.

When not in use or in carrying the device from one job to another the stop member 37 is turned sidewardly as shown in Fig. 1 to allow the handle to be brought parallel to the base channel 10. The handle 19 is then secured to the base channel 10 by means of a suitable chain 40, and serves as a suitable grip for carrying the device.

The side walls of the two sectors are cut away at the upper extremity as shown at 45 so that when the handle is in the position of Fig. 3 the conduit can be removed from the device or placed therein through the sides of the sectors, thus making it unnecessary to pass the entire length of conduit under the bending sectors or to release the link 23 if it is desired to place or remove a conduit length.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:—

1. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; and means for securing said sector at any desired elevation above said base member.

2. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member, said sector comprising: a plurality of arcuate tracks of differing diameters.

3. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member; said locking means comprising: a hinged plate adapted to swing against the pipe at one extremity of said sector.

4. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member; said locking means comprising: a hinged plate adapted to swing against the pipe at one extremity of said sector; and a hooked extremity on said plate adapted to engage said sector so as to prevent said plate from being forced away therefrom.

5. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arms; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member; said locking means comprising: a hinged plate adapted to swing against the pipe at one extremity of said sector; and an adaptor member incorporated in said plate so as to adapt it to contact with differing diameters of pipe.

6. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member; and a stop arranged to limit the bending movement of said sector.

7. A pipe bending device comprising: a base member; a bearing arm pivotally secured at one side of said base member; a bearing shaft supported by said bearing arm; a bending sector mounted upon said bearing shaft; means for locking a pipe at one extremity of said sector; means for securing said sector at any desired elevation above said base member; a stop arranged to limit the bending movement of said sector; and means for adjusting said stop so that it will limit said movement to a desired arc.

8. A pipe bending device comprising: a base channel; roller shafts carried in said base channel; rollers mounted on said shafts; a bearing arm hinged upon one of said shafts and extending above said base channel; a bending sector member journaled on said bearing arm and arranged to swing over said base channel; a link pivoted on another of said shafts; a projection on said link adapted to engage openings in said bearing arm so as to support said sector at any desired elevation.

9. A pipe bending device comprising: a base channel; roller shafts carried in said base channel; rollers mounted on said shafts;

a bearing arm hinged upon one of said shafts and extending above said base channel; a bending sector member journaled on said bearing arm and arranged to swing over said base channel; a link pivoted on another of said shafts; a projection on said link adapted to engage openings in said bearing arm so as to support said sector at any desired elevation; and a spring acting to force said projection into said openings.

10. A pipe bending device comprising: a base channel; roller shafts carried in said base channel; rollers mounted on said shafts; a bearing arm hinged upon one of said shafts and extending above said base channel; a bending sector member journaled on said bearing arm and arranged to swing over said base channel; a link pivoted on another of said shafts; a projection on said link adapted to engage openings in said bearing arm so as to support said sector at any desired elevation; and a stop member carried by said bearing arm and arranged to limit the movement of said sector member.

11. A pipe bending device comprising: a base channel; roller shafts carried in said base channel; rollers mounted on said shafts; a bearing arm hinged upon one of said shafts and extending above said base channel; a bending sector member journaled on said bearing arm and arranged to swing over said base channel; a link pivoted on another of said shafts; a projection on said link adapted to engage openings in said bearing arm so as to support said sector at any desired elevation; a bracket extending beyond the arc of said sector; a locking plate hinged in said bracket so as to swing toward said sector and lock a pipe against one extremity thereof.

In testimony whereof, I affix my signature.
JAMES HENRY BLYTHE.