Jan. 1, 1924 1,479,762

A. WAGENBACH

BENDING DEVICE FOR BAR IRON

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Fig. 1.

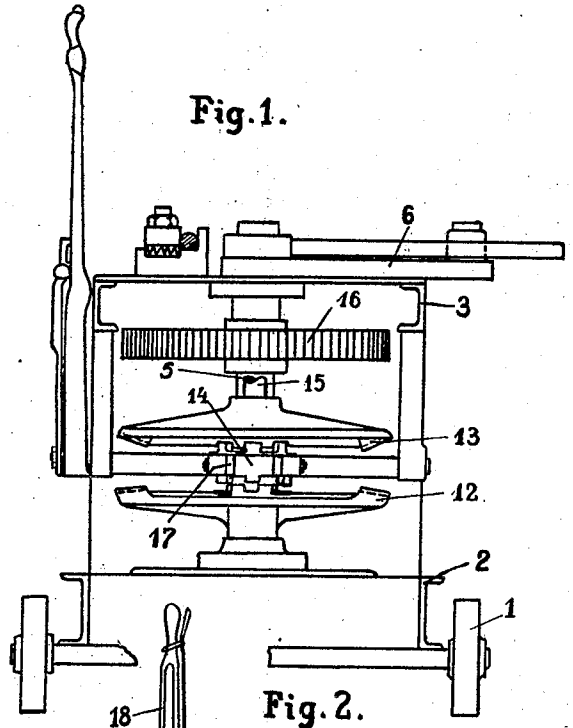
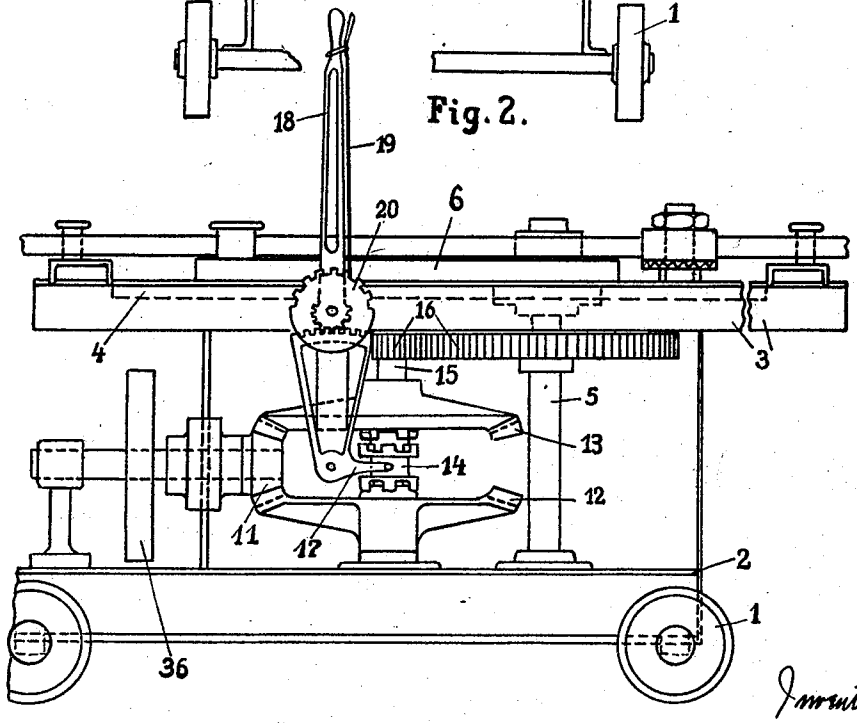


Fig. 2.



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Fig. 7.

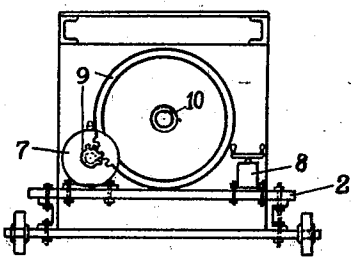


Fig. 3.

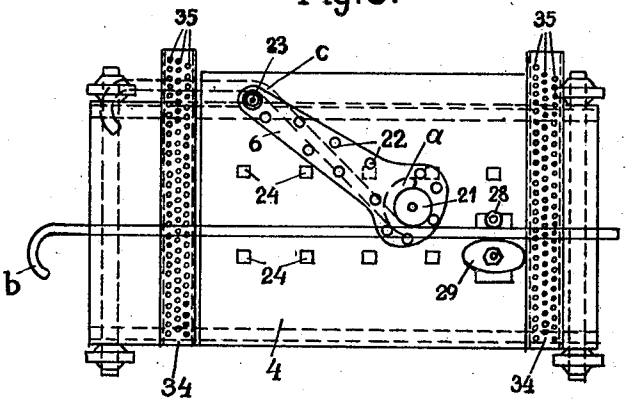
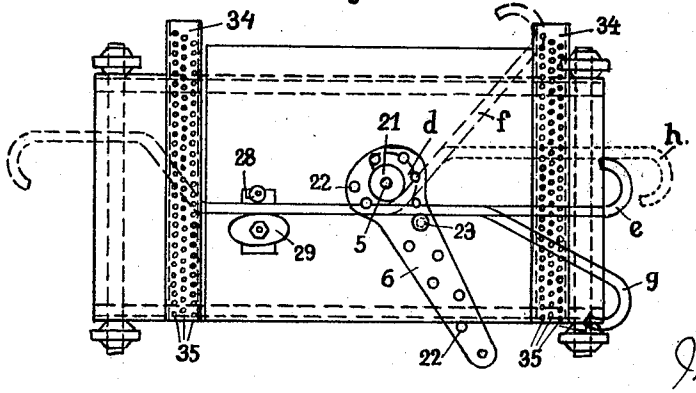


Fig. 4.



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Fig.5.

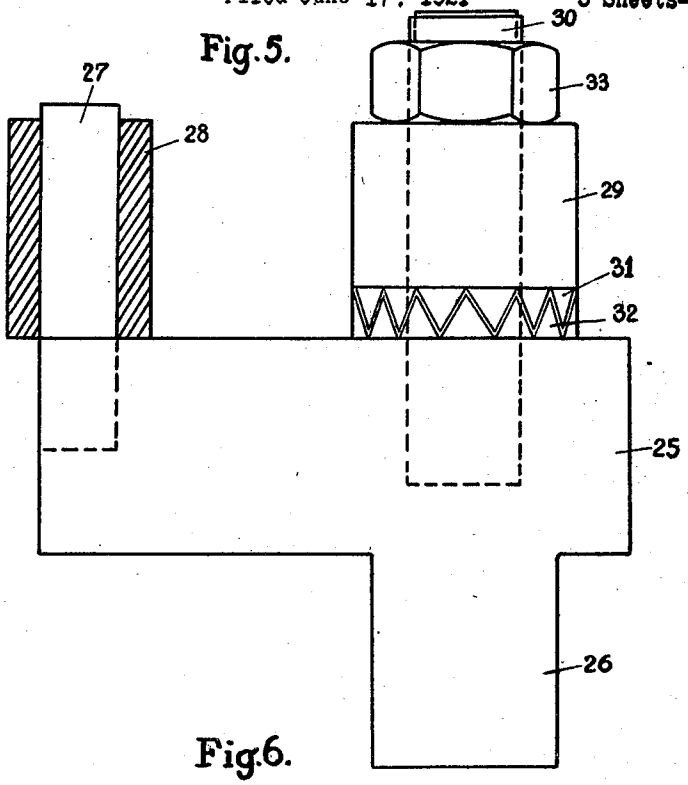
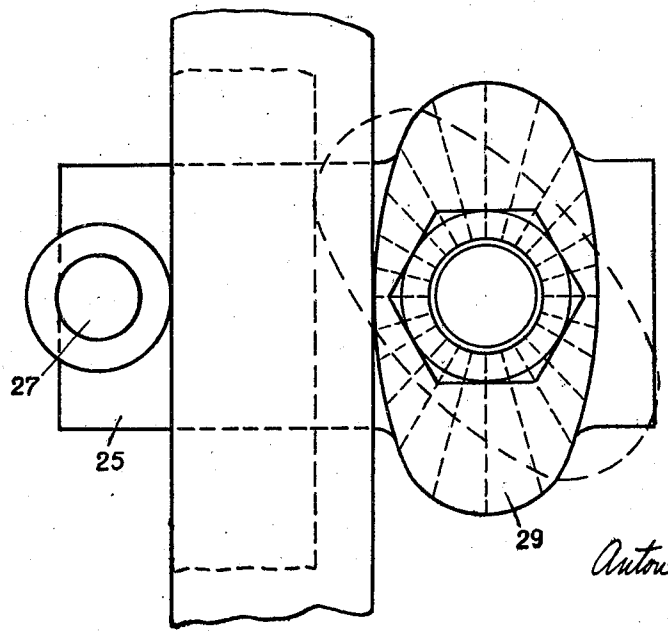


Fig.6.



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UNITED STATES PATENT OFFICE.

ANTON WAGENBACH, OF ELBERFELD, GERMANY.

BENDING DEVICE FOR BAR IRON.

Application filed June 17, 1921. Serial No. 478,370.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, ANTON WAGENBACH, a citizen of the Commonwealth of Germany, residing at Elberfeld, Germany, have invented a new and useful Bending Device for Bar Iron (for which I have filed an application in Germany May 4, 1917, on which Patent No. 336,743 was granted May 13, 1921, W-50780 I/49f), of which the following is a specification.

In bending devices for concrete iron and other iron bars the use of a bending lever is known which is moved over a bearing plate and which in connection with stops which can be inserted in said plate permits the bending of iron in various desired shapes. In these cases the bending lever is generally operated by hand. On the other hand bending machines driven by motor power for bending heavier iron are known in which the bending lever can be run in either direction by a motor, in order to bend the iron held by a guide into any desired shape. In this case the disadvantage exists that the iron held in the guide can only be bent at the end, and when, for instance, the iron intended to brace the concrete is to be bent at the other end, it must be taken out of the guide, swung around in a large circuit and then again inserted at the other end in the guide, a considerable amount of time and space being required for handling the iron bars which are usually very long.

The essential part of the present invention, on the contrary, consists in a bending machine with a lever run by motor power in both directions in which the latter and the plate in which the stops are inserted are so fitted on both sides with holes or devices for receiving such stops that as a result of the ability to work in both directions both ends of the bars can be bent in succession by simply inserting the iron once into the machine.

An important improvement of the new bending device consists in providing the eccentric serving as holder for the iron to be bent in the usual manner corresponding to the symmetry attained by the reversibility of the machine, with a cogged indented surface fitting a correspondingly cogged fundamental plate upon which it can be pressed by a pressing device. This rigid adjustability of the eccentric in the first place permits of widest adjustability to the thinnest as well as to the thickest iron and furthermore a secure grip on same is obtained even when the gripping device is subjected to strains in various directions as a result of reversing the bending lever. Hereby the eccentric together with the poppet with which it fixes the iron, can be united on a common foundation plate carrying in turn a peg or other gripping device for insertion into the sole-plate, thereby permitting of easy and quick changing.

The drawing shows two examples of the new motor-run bending device, as follows:

Fig. 1 is a side view of the entire machine of the first constructional form.

Fig. 2 is a front view.

Fig. 3 is a top view of the machine with one position of the bending lever with indications of the various bendings of one iron bar end.

Fig. 4 is a similar view showing various bendings of the other iron bar end.

Fig. 5 is a side view partly in section of the gripping eccentric.

Fig. 6 is a top view of the design shown in Fig. 5.

Fig. 7 shows a constructional form in which the machine is driven by a directly connected electric motor.

The machine carries on a fundamental frame 2 resting on four wheels 1 an upper frame 3 on which in turn is a sole plate 4. Between the fundamental frame 2 and the sole plate 4 a bending shaft 5 is journalled, on which the bending lever 6 is keyed.

The bending shaft 5 is driven by an electric motor by means of a pulley 36 driving a horizontal intermediate shaft 10. The horizontal intermediate shaft 10 engages by means of a bevel gear wheel 11 two other bevel gear wheels 12, 13 which can be alternately connected with a perpendicular intermediate shaft 15 by means of a disengaging clutch 14 consisting of a sleeve slidably mounted, on the intermediate shaft 15 and fitted with jaws adapted to catch the said wheels 12 and 13 alternately. The power is transmitted from the perpendicular intermediate shaft 15 through a pair of spur gear wheels 16 on to the bending shaft 5.

For engaging the clutch 14 a knee lever 17, constructed as an arched rack on one

arm, is provided which can be swung back and forth by means of the hand lever 18 equipped with a correspondingly arched rack, for variously engaging the clutch 14, and bearing a cross-bar 19 for locking in the various positions, which drops and catch-locks in the pinion 20.

The bending shaft 5 projects through the bending lever 6 with a journal on which rollers 21 of various sizes for effecting various radii of curvature can be fitted. The bending lever 6 is provided with a number of holes 22 at varying distances from the bending axis and in which the bending pegs 23 are inserted. The sole-plate 4 contains square holes 24 in which the gripping eccentrics (Figs. 6, 7) are held. This gripping device consists of a fundamental plate 25 with pegs 26 fitting into the square holes, and on said fundamental plate on one hand a pin 27 is provided with interchangeable roller 28 and on the other hand the real eccentric 29. The eccentric 29 which is built as a symmetric double eccentric, is inserted on a pin 30, on the fundamental plate 25 and is provided with a set of teeth 31 which fit into a similar circular set of teeth 32 in the fundamental plate 25. A nut 33 serves to keep the teeth tightly locked together.

On the sole plate 4 are finally two cross ledges 34 containing a large number of holes 35 into which bolts may be inserted for attaching iron angle brackets and similar stops for bending purposes.

The machine is operated as follows:

When it is desired to bend a piece of iron, this is first of all secured in the manner shown in Fig. 4 by the eccentric 29 inserted to the right and properly adjusted, whereupon the curve *a* is bent between the principal roller 21 and a bolt lying close by inserted in the bending lever 6. Thus the roller 28 permits a shifting of the iron in bending, so that the curve is bent as if on a cylinder and can be performed even on heavy iron without any unpermissible distortions. The iron is hereafter drawn through to position *b* of the hook and by placing the bending bolt 23 into the place indicated in Fig. 4, the form *c* is given to the iron. A bolt inserted in one of the holes 35 or an iron angle bracket secured by means of same serves as a bending stop, so that the double curvature is accomplished by a single turn of the bending lever.

In order to bend the other end of the same iron bar, the eccentric 29 is placed in the position shown in Fig. 5 whereupon after drawing the iron through, the curve *d* is bent, the position of the bending lever being shown in the drawing. After drawing the curve through to the position *e* either the bending to position *f* is effected, or after drawing and turning the iron further it is bent to position *g*, else the double bending indicated by *h* may also be accomplished. This double bending can, of course, be performed by a single movement of the bending lever as shown also in Fig. 4 and any other desired bendings can be accomplished.

As in the case of long iron bars and such as have already been bent, it is necessary to avoid turning the iron, the eccentric may be inserted in any other of the holes 24, as, for instance, in the upper row of Fig. 4 and by reversing the mechanism of the bending lever 6, any bendings in an opposite direction can be performed.

In the constructional form shown in Fig. 7 on the fundamental frame 2, an electric motor 7 is arranged which is governed by a starter 8, and drives the intermediate shaft 10, by aid of toothed wheels 9. In all other respects the machine is built and handled in the same manner as the first described machine.

Having now particularly described and ascertained my said invention, what I claim and desire to secure by Letters Patent of the United States is:

Bending device for bar iron, comprising in combination a motor, a driving gear, a bending lever arranged to be driven by the said motor in both directions, a sole plate provided with holes on opposite ends and stops arranged to be received in the said holes to enable the work to be inserted in the machine in either direction, and an eccentric serving as poppet for the iron provided with an indented bottom surface, a device on the sole plate provided with an indented or corrugated surface into which the said bottom surface of the eccentric can be pressed, and a pressing mechanism.

In witness whereof I affix my signature.

ANTON WAGENBACH.