March 4, 1930. C. G. FILLMORE 1,749,476

ROD BENDING TOOL

Filed March 7, 1928

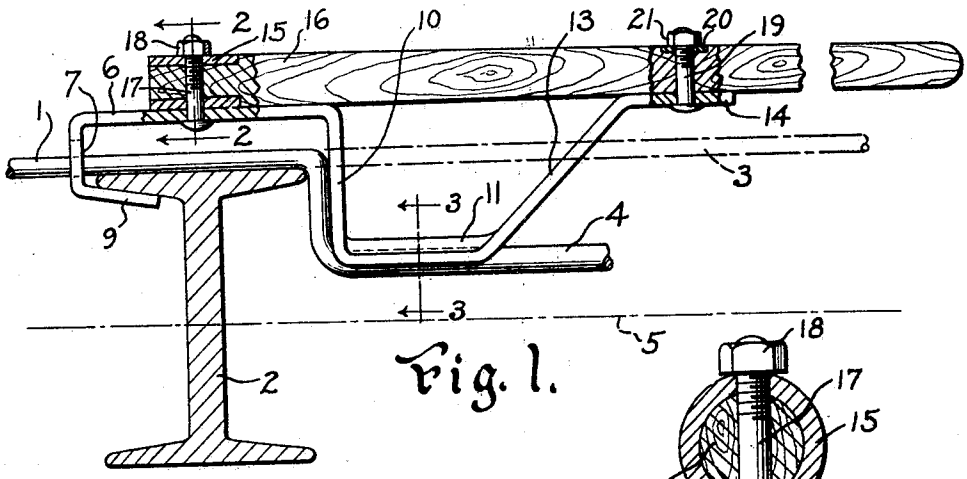



Fig. 1.




Fig. 2.

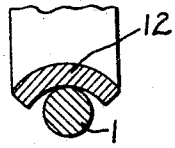



Fig. 3.

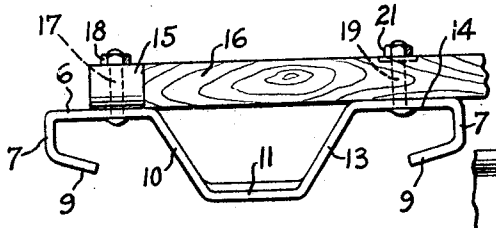



Fig. 5.

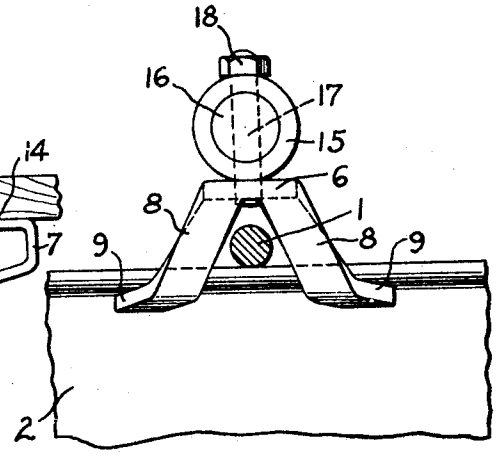



Fig. 4.

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# UNITED STATES PATENT OFFICE

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## ROD-BENDING TOOL

Application filed March 7, 1928. Serial No. 259,731.

This invention relates to improvements in bending tools and has particular reference to an improved tool for bending rods, and to an improved process of bending rods after installation in place particularly the rods of mats for concrete reinforcement and the like.

The principal object of the invention is to provide an improved process for bending rods or the like which are supported by structural work after the said rods have been installed in place in the work.

Another object of the invention is to provide an improved bending tool which will straddle the rod to be bent, engage the structural support for the same and apply the bending pressure at the point required.

Another object of the invention is to provide an improved tool for bending rods or the like which are supported by structural work which will be simple in construction, efficient and economical.

Another object of the invention is to provide a tool of this character with easily attached and operable lever means.

Another object of the invention is to provide means on such a tool that will present a non-slipping grip on the work itself and on the structure connected with the same.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings, and it will be apparent that changes in the arrangements of the parts, steps in the process and details of construction may be made without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details and arrangements shown and described as the preferred forms only have been given by way of illustration.

Referring to the drawings:

Fig. 1 is an elevation partially in cross section showing the tool in use at the end of the bending operation;

Fig. 2 is a cross section on line 2—2 of Fig. 1;

Fig. 3 is a cross section on line 3—3 of Fig. 1;

Fig. 4 is an end view of Fig. 1 showing the end of the tool;

Fig. 5 is a partial elevation showing a modification.

Concrete floors are supported between structural beams by a mat composed of cross rods that lie across the structural beams held together by spacer rods. Between the structural beams the rods are bent down below the floor level so that the bent portion of the rod will lie about one inch from the bottom of the concrete flooring. It has been found from experience that this position gives the best result as to structural strength and wearing properties. It has been usual in the prior art to bend these rods before they are placed in the building. If there is any variation in the building from the plans, or if the rods have not been properly bent they do not fit and it is a difficult and expensive operation to remove these rods from the structure, take them out and have them bent to shape. The price of labor for operators who perform this kind of work is high and the work of re-bending and positioning rods of this nature has constituted a large item of expense in the laying of concrete floors in the past.

It is, therefore, one of the prime objects of my invention to provide an improved process for doing this work and means which can do this work in the building as the floors are laid without removing the parts to have them adjusted to fit conditions. It has been found that in this process considerable expense is saved and a much more desirable job obtained.

Referring to the drawings wherein similar reference characters denote corresponding parts throughout, the cross rods 1 are laid across the floor beams 2 initially occupying the horizontal position illustrated by the dot and dash line 3 in Fig. 1, one end of the rods being secured in place and the other end thereof being left free and unsecured until after the bending operations hereinafter described have been completed, and then the other end is secured in place to fit the structural requirements.

It is the object of the present invention to bend a portion of the rod 1 after it has

been laid over the beams and secured as described above, down below the top of the beam 2 until it occupies a position illustrated by the portion 4 of the rod 1 in Fig. 1. This position is approximately about one inch above the bottom level of the concrete flooring indicated by dot and dash line 5 in Fig. 1. To perform this bending I provide my bender tool which has the body portion 6 having a bent down portion 7 which is separated into two arms 8, terminating in the two clamp hook members 9. The separated jaws 8 straddle the rod 1 as indicated in Fig. 4 and the hook members 9 engage the under side of the floor beam 2 as indicated in Fig. 1. At a position spaced from the downwardly bent portion 7 is a second downwardly bent portion 10 which leads into a substantially horizontally disposed bending portion 11 having a curved cross section 12 to bear on the rod 1, as indicated in Fig. 3. Continuing from the portion 11 is an ascending inclined arm 13 which continues into a horizontal portion 14 lying substantially on a line with the portion 6. Secured to the portion 6 is the handle ring 15 into which is fitted the handle 16. A bolt member 17 is extended through the portion 6, the ring 15 and the handle 16 and terminates beyond the upper portion of the ring 15. On the upper portion of the bolt 17 is placed the nut 18 to hold the parts together. Through the portion 14 of the tool a second bolt 19 is extended passing through the handle 16 and beyond. On the upper side of the handle 16 the washer 20 and the nut 21 are provided. The handle 16 is extended longitudinally beyond the portion 14 to an extent to give the required leverage.

The operation of the device is as follows: The rods 1 are laid across the beam 2. The hooks 9 of the bender are placed under the top flange of the beam 2 so that the rod 1 passes between the separated arms 8, the section 11 of the bender coming in contact with the rod 1 along the curved surface 12 of the section 11. Pressure is applied upon the end of the handle 16 and the rod 1 is bent down until a portion of it assumes the relationship with the floor indicated by 4 in Fig. 1, which position is substantially about one inch above the bottom of the floor level 5.

In Fig. 5 I have shown a modification wherein the section 14 is bent down and provided with the separated arms and hook members similar to the opposite end so that either end of the bender may be used to grip the structural beams. It will be seen that in this modification if the left hand hook is engaged with the beam the bender will be operated by pushing down on the handle, whereas if the right hand hooks are used it will be operated by pulling up on the handle. If desired also the handle could be reversed in case one of the hook members were broken.

It will be understood from the foregoing description that a plurality of rods 1 are laid over the beams 2, properly spaced from each other to form the mat for the concrete filling and tied together by tie rods transverse to the rods 1 at required distances between the beams 2. One end of the rods 1 are secured in the structure the other end being left free. The rods 1 are then bent down between the beams 2 as described above carrying with them the cross tie rods. The free ends of the rods 1 are then secured in the structure and the concrete poured over the mat between the beams 2 on top of the form mold indicated by the line 5. The concrete is then allowed to set and the form mold removed, leaving the concrete floor complete with the mat embedded therein. The mat has been completed with the rods in place in the work thus insuring economy of operation and accuracy of fit and placement.

From the foregoing description it will be seen that I have provided simple, efficient and economical means for obtaining all the objects of the invention.

Having described my invention, I claim:

1. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a bifurcated hook member depending from the connecting portion forward of the forward handle connection, a bend forming projection depending from the forward connecting portion rearwardly of the forward handle connection, a portion connecting the projecting portion and the rear handle connecting portion at a point forward of the rear handle connection, a handle member overlying the two handle connecting portions, and means securing the handle to each of the handle connecting portions.

2. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a bifurcated hook member depending from the connecting portion forward of the forward handle connection, a bend forming projection depending from the forward connecting portion rearwardly of the forward handle connection and having a concave bearing surface, a portion connecting the projecting portion and the rear handle connecting portion at a point forward of the rear handle connection, a handle member overlying the two handle connecting portions, and means securing the handle to each of the handle connecting portions.

3. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a hook member depending from the connecting portion forward of the forward handle connection, a

bend forming projection depending from the forward connecting portion rearwardly of the forward handle connection, a portion connecting the projecting portion and the rear handle connecting portion at a point forward of the rear handle connecting portion, a handle member overlying the two handle connecting portions, and means securing the handle to each of the handle connecting portions.

4. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a hook member depeding from the connecting portion forward of the forward handle connection, a bend forming projection depending from the forward connecting portion rearwardly of the forward handle connection, a portion connecting the projecting portion and the rear handle connecting portion at a point forward of the rear handle connecting portion, a handle member overlying the two handle connecting portions, a tubular ferrule on the forward end of the handle portion, means through the handle and ferrule securing the forward end of the handle to the forward connecting portion, and means securing the rear connecting portion to the handle.

5. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a hook member depending normally from the forward connecting portion and bent rearwardly to underlie the same, a member depending normally from the forward connecting portion rearwardly of the handle connection, a bend forming projection member extending rearwardly of the said depending portion and substantially parallel with the connecting portions, a portion connecting said bend forming member and the rearward connecting portion at a point forward of the rear handle connection, and means securing the handle to each of the handle connecting portions.

6. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection and comprising two separated handle connecting portions in longitudinal alignment, a hook member depending from the connecting portion forward of the forward handle connection, a bend forming projection depending from the forward connecting portion rearwardly of the forward handle connection, a portion connecting the projecting portion and the rear handle connecting portion at a point forward of the rear handle connection, a handle member overlying the two handle connecting portions, and bolt means securing the handle means to each of the handle connecting portions.

7. In a device of the character described, a rigid member providing a fulcrum and a bend forming projection comprising a base member having a depending hook portion adjacent one end, a bend forming projection intermediate the hook portion and the opposite end, said bend forming projection having a pair of supporting members depending from the base and carrying a bend contacting portion, and a handle secured to the base portion.

8. In a device of the character described, a rigid member providing a fulcrum end and a bend forming projection comprising a base portion having a depending hook portion adjacent one end, a bend forming projection depending intermediate the hook and the opposite end of said base portion, a curved contact bearing surface on the bend forming projection lying substantially parallel with the base portion, and a handle secured to the base portion.

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