March 8, 1927. A. MELVILLE ET AL 1,619,951

MACHINERY FOR BENDING METALLIC RODS, WIRES, OR THE LIKE

Filed Aug. 27, 1926 4 Sheets-Sheet 1

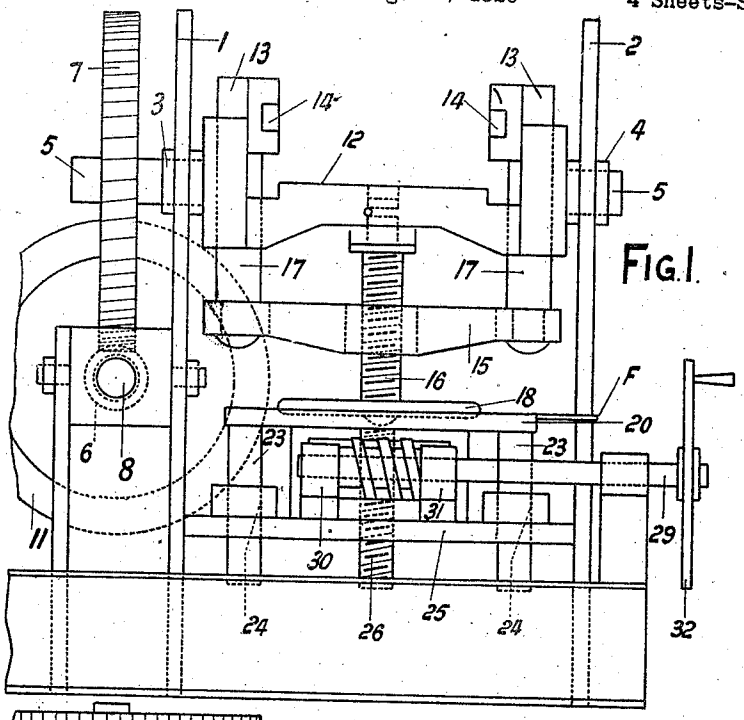


FIG. 1.

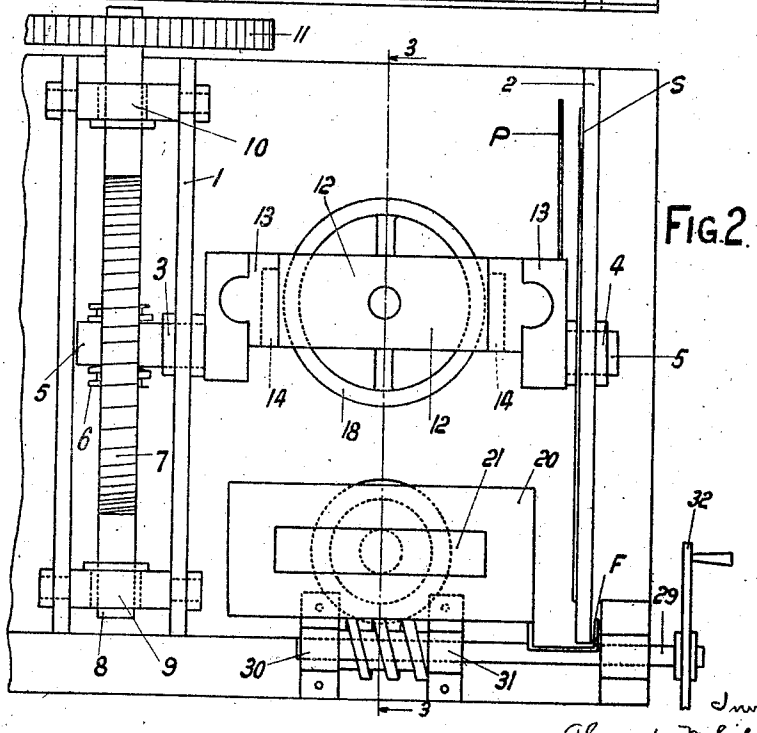


FIG. 2.

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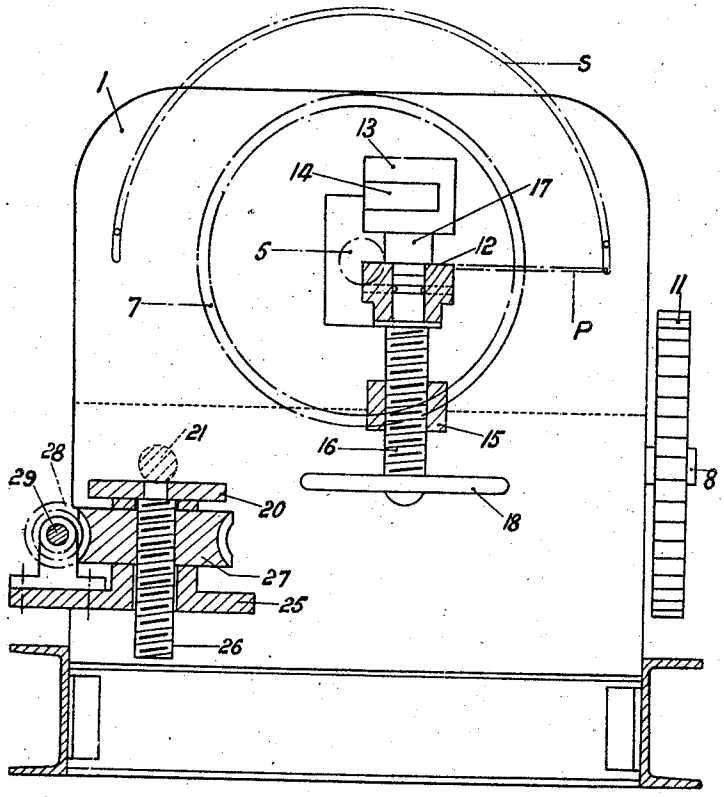


FIG. 3.

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MACHINERY FOR BENDING METALLIC RODS, WIRES, OR THE LIKE

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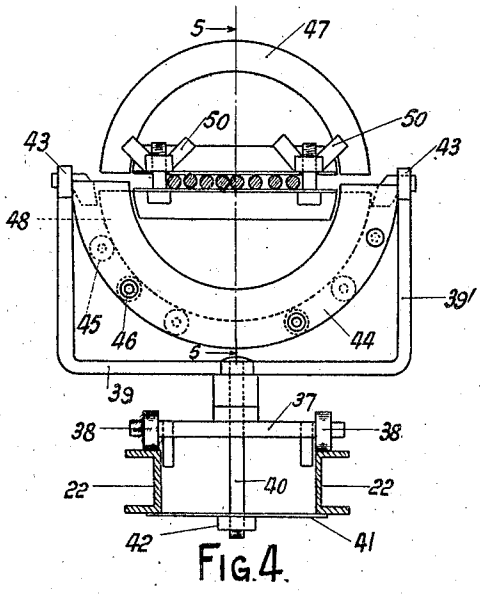


FIG. 4.

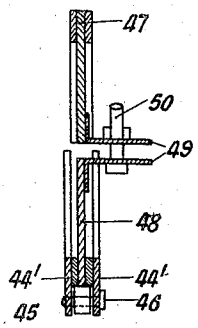


FIG. 5.

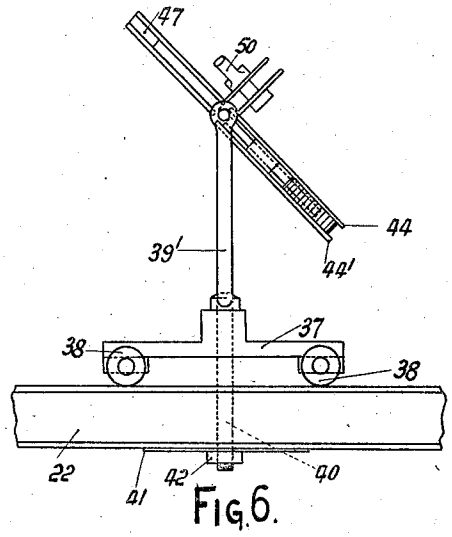


FIG. 6.

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MACHINERY FOR BENDING METALLIC RODS, WIRES, OR THE LIKE

Filed Aug. 27, 1926 4 Sheets-Sheet 4

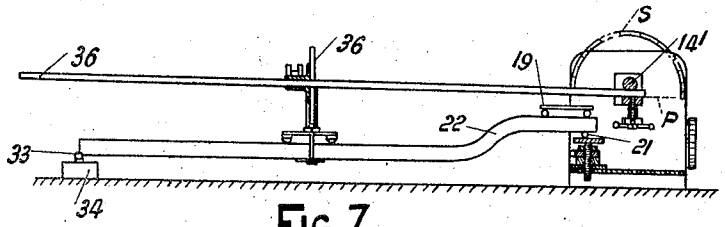


FIG. 7.

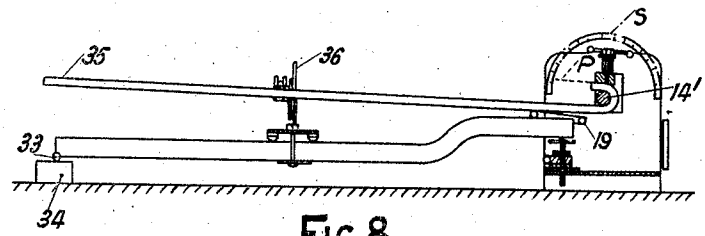


FIG. 8.

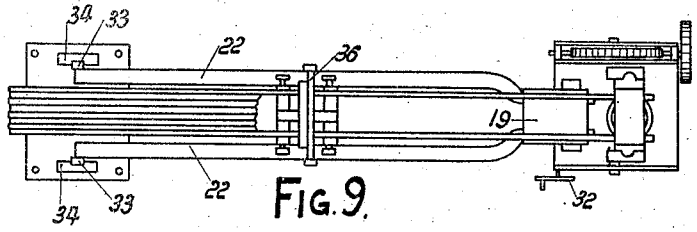


FIG. 9.

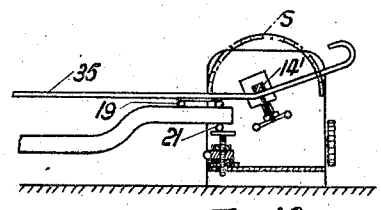


FIG. 10.

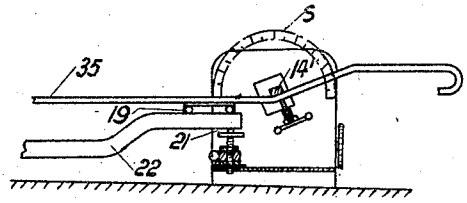


FIG. 11.

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UNITED STATES PATENT OFFICE.

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MACHINERY FOR BENDING METALLIC RODS, WIRES, OR THE LIKE.

Application filed August 27, 1926, Serial No. 131,876, and in Great Britain August 12, 1926.

This invention relates to a machine for bending metallic rods, wires or the like as used for reinforcement of concrete, the machine being of that type incorporating an oscillatory bending shaft presenting a jaw face between which and an operative die member are clamped the rods, wires or the like to be bent, a carrier for the rods, wires or the like mounted to travel on a track, and an adjustable resistance member engageable by the rods, wires or the like when the bending shaft and therewith the jaw and die member are oscillated.

In accordance with the invention the resistance member is constituted as a carriage sustained by the said track which latter is hinged at a point remote from the bending shaft, provision being made for moving the track on its hinges to adjust the elevation of the resistance the spacing of which from the jaw face and die is variable by displacement of the carriage.

The carrier for the rods, wires or the like is contrived to effect any desired change of position, including inversion, of the rods, wires or the like.

In operation, a number of rods, wires or the like are clamped in the carrier and the track adjusted to bring the resistance member into the requisite position depending on the form and acuteness of bend desired. During the bending operation the resistance member or carriage moves forward along the track until the forward end of the carriage leaves the track when the bent rods, wires or the like may be readily withdrawn.

The invention is illustrated in the accompanying drawings in which Fig. 1 is an elevation of a bending machine constructed in accordance with the invention; Fig. 2 is a plan; Fig. 3 is a vertical section on the line 3—3 of Fig. 2; Fig. 4 is an elevation of the carrier; Fig. 5 is a section on the line 5—5 of Fig. 4; Fig. 6 is an end elevation of the carrier showing the rod clamp in tilted position; Figs. 7 to 11 are diagrammatic views showing the various stages of the bending operation; Fig. 7 shows the rods clamped between the die member and the jaw face at the commencement of the operation; Fig. 8 shows the bend formed after movement of the bending shaft through 180°, the forward end of the resistance or carriage having just left the track; Fig. 9 is a plan of Fig. 7; Figs. 10 and 11 show how rods already bent at the ends may be given a double joggle, being shown receiving the first joggle in Fig. 10 after which the die is retracted, the set of rods inverted, the carrier moved forward and the rods again clamped ready for the second joggle which is shown completed in Fig. 11.

The machine shown comprises two vertical side frames 1 and 2 in which is journalled at 3 and 4 an oscillatory bending shaft 5 fast on which is a worm-wheel 7 engaged by a worm 6 on a shaft 8. The shaft 8 is journalled in bearings 9 and 10 and mounted on one end thereof is a spur gear 11 forming an element of a train of gearing connected to a prime mover (not shown). The shaft 5 presents a jaw face 12 at each end of which is slidably mounted a member 13 presenting on its face, perpendicular to the face 12, a recess 14 adapted to receive one end of a bending die 14′ (Figs. 7–11). The die-carrying members 13 are adjustable relatively to the jaw face 12 by rotation of a screw 16 connected to the part 12 and threaded into the cross-head 15 connected to the die-carrying members 13 by means of rods 17 slidable in apertures in the shaft 5. Fixed to the screw 16 is a handwheel 18 for effecting rotation of the screw.

Indicating means is provided for indicating the extent of angular movement of the shaft 5, said means comprising in the present instance a semi-circular scale S fixed to the side frame 2 and a pointer P fixed to the shaft 5.

19 denotes the resistance member constituted as a carriage mounted on rails 22. The means of adjustment of the member 19 includes a plate 20 presenting a horizontal face on which is laid a roller 21 upon which the rails 22 rest at one end. The plate 20 is mounted on vertical guide bars 23 slidable through apertures 24 in a guide plate 25 fixed between the frames 1 and 2. Positioned between the bars 23 is a vertical screw 26 fixed to the plate 20 and engaged by a nut-forming worm-wheel 27 meshed by a worm 28 mounted on a horizontal shaft 29 journalled at 30 and 31 and carrying an operating handwheel 32. An index finger F on the plate 20 co-operative with a scale on the side frame 2 serves to indicate the rise and fall of the plate 20.

As shown in Figs. 7 and 8, the ends of the rails 22 remote from the shaft 5 are hinged at 33 to ground blocks 34.

Rods 35 are clamped between their ends

in a carrier or trolley 36 mounted on the rails 22. At a point beyond the resistance member 19 the rods are clamped between the die member 14′ and the jaw face 12.

The carrier 36, Figs. 4–6, comprises a structure 37 mounted on wheels 38 bearing on the rails 22 and supporting a rotatable bifurcated frame 39 carried by a vertical bolt 40 which is rotatably mounted in the structure 37. Threaded on the bolt 40 is a nut 42 engageable with a plate 41 bearing on the under sides of the rail 22, the bolt and associated parts constituting a locking device whereby the carrier may be locked in position on the rails 22 and rotation of the frame 39 prevented. Gimballed at 43 between the arms 39′ of the frame 39 is a semi-circular frame 44 comprising two plates 44′ interposed between which are spaced rollers 45 mounted on pivots 46 which serve to connect the plates 44′. Engaged between the plates 44′ is a disc rotatable on the rollers 45 around its own axis, said disc being built up of two semi-circular segments 47 and 48 having angle lugs 49 connected across their faces associated with clamping screws 50 to afford a clamping device for the rods 35.

What we claim is:—

1. In a bending machine for the purpose specified, in combination, an oscillatory bending shaft presenting a jaw face, a die member co-operative with said jaw face to clamp rods or the like to be bent, a track, a carrier for the rods or the like to be bent, said carrier mounted to travel on said track, and an adjustable resistance member constituted as a carriage sustained by said track and engageable by the rods or the like to be bent when said shaft is oscillated.

2. In a bending machine for the purpose specified, in combination, an oscillatory bending shaft presenting a jaw face, a die member co-operative with said jaw face to clamp rods or the like to be bent, a track, said track hinged at a point remote from said shaft, means for moving said track on its hinges, a carrier for the rods or the like to be bent, said carrier mounted to travel on said track, and an adjustable resistance member constituted as a carriage sustained by said track and engageable by the rods or the like to be bent when said shaft is oscillated.

3. In a bending machine for the purpose specified, in combination, an oscillatory bending shaft presenting a jaw face, a die member co-operative with said jaw face to clamp rods or the like to be bent, a track, a carrier for the rods or the like to be bent, said carrier comprising a wheel structure movable on said track, a rotatable frame supported by said structure, a second frame gimballed in said rotatable frame and a clamp forming disc rotatable around its own axis in said second frame, and an adjustable resistance member constituted as a carriage sustained by said track and engageable by the rods or the like to be bent when said shaft is oscillated.

In testimony whereof we have signed our names to this specification.

ALEX. MELVILLE.
DAVID McDOUGALL.