Oct. 26, 1926. 1,604,543

E. H. WILSON

ROUNDING MECHANISM

Filed Nov. 20, 1923 2 Sheets-Sheet 1

Fig. 1.

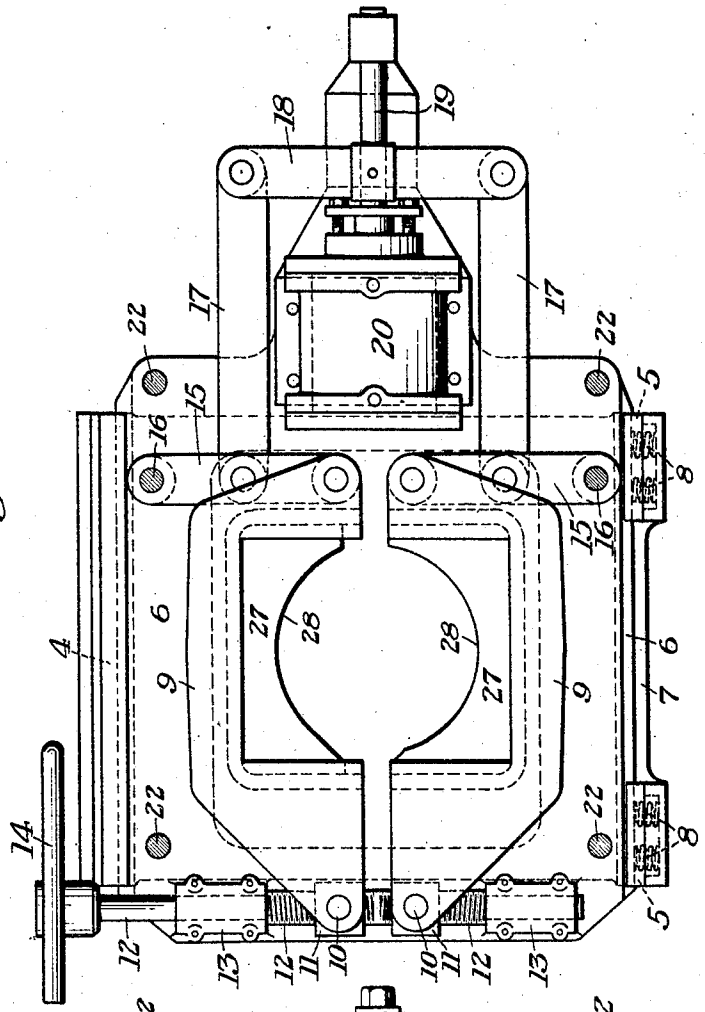
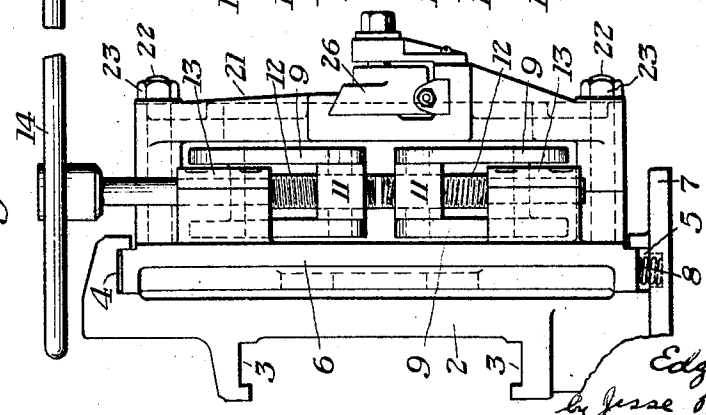


Fig. 3.



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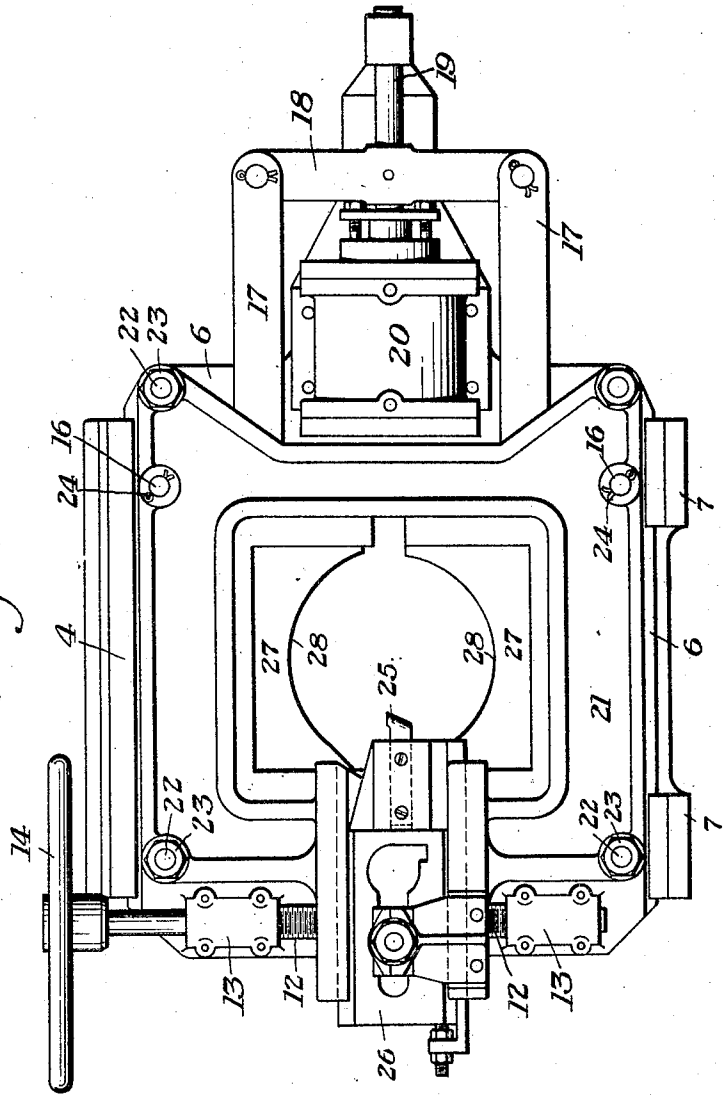
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Fig. 2.



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UNITED STATES PATENT OFFICE.

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ROUNDING MECHANISM.

Application filed November 20, 1923. Serial No. 675,858.

The present invention relates broadly to the metal working art, and more particularly to rounding mechanism for use in connection with pipe threading machines.

It is customary to provide a pipe threading machine with means for rounding the ends of the pipes so as to make them truly cylindrical preparatory to cutting the threads thereon. This rounding mechanism usually comprises a rounding die consisting of upper and lower rounding blocks, the lower block being stationary and the upper block having operating means associated therewith for causing the same to approach and recede from the lower block. The threading machine is usually provided with a rotatable barrel in which each pipe to be operated upon is inserted, and in which it is supported during the rounding operation, as well as during the threading operation.

An objection to a rounding mechanism of this character is that when the two blocks are separated by moving the upper block away from the lower block, and the pipe is pushed through the barrel of the threading machine so as to position the portion thereof to be rounded between the blocks, if the end of the pipe is badly distorted, it is apt to strike against the stationary lower block. Another objection to a rounding mechanism in which only the upper block is movable is that the two blocks are worn unevenly.

By the present invention these objectionable features are avoided by the provision of a rounding mechanism in which both blocks of the rounding die are moved towards and from each other.

Another feature of the invention resides in the provision of means for adjusting the path of movement of each of the rounding blocks.

Still another feature of the invention is the provision of a floating support for the rounding die and the adjusting and operating means associated therewith.

In the accompanying drawings, there is shown, for purposes of illustration only, one embodiment of the present invention, it being understood that the drawings do not define the limits of the invention, as changes may be made in the construction and operation therein disclosed without departing from the spirit of the invention or scope of my broader claims.

In the drawings:—

Figure 1 is a front elevation of a rounding mechanism embodying my invention, the cover plate being removed;

Fig. 2 is a view corresponding to Fig 1 with the cover plate in position, and

Fig. 3 is a side elevation of the structure shown in Fig. 2.

Referring to the drawings, the rounding mechanism comprises a carriage 2 having oppositely facing channels 3 adapted to receive ribs on a threading machine, whereby the carriage is held in position on the machine. This carriage is provided with oppositely facing upper and lower horizontal channels 4 and 5 receiving the upper and lower edge portions of a support 6 for the rounding die and the operating means therefor. Positioned in the channels 5, and interposed between the lower edge of the support 6 and the base 7 of the carriage 2, are a plurality of coil springs 8, whereby the support 6 is yieldingly held away from the base 7. The support 6 therefore constitutes a floating support for the rounding die and its adjusting and operating means. This is an advantageous feature of the construction, in that the floating support is permitted to have a slight bodily movement, both in a vertical direction and in a horizontal direction, thereby preventing undue strain upon the parts during the rounding operations.

A pair of opposite rounding block holders 9 are pivoted at one end upon pivot pins 10 carried by nuts 11. These nuts are in engagement with a right and left screw 12, which is journaled in bearings 13 on the support 6, and is provided at its upper end with an operating handle 14. A toggle 15 is pivotally connected at one end to the opposite end of each holder 9, each of said toggles being pivoted at its opposite end upon a pin 16 carried by the support 6. The toggles are connected by parallel links 17 with a cross-head 18 carried by the piston rod 19 of a piston working in a fluid pressure cylinder 20.

The support 6 is provided with a cover

plate 21 held in position thereon by bolts 22 and nuts 23, the bolts being carried by the support and projecting through openings in the cover plate. The pivot pins 16 for the toggles 15 also project through openings in the cover plate, and cotter pins 24 are inserted through openings in the outer ends of said pins, said cotter pins cooperating with the nuts 23 to hold the cover plate in position. A cutter 25 for cutting off the ends of the pipes is mounted upon a horizontally adjustable slide 26 carried by the cover plate.

The rounding block holders 9 are provided with U-shaped channels to receive upper and lower rounding blocks 27 of the rounding die having opposed arcuate rounding surfaces 28. The upper rounding block may be held in position by any suitable means, and different sizes of rounding blocks may be provided so that any desired size of blocks may be positioned in the holders, depending upon the size of pipe to be operated upon.

In the operation of the rounding mechanism, the hand wheel 14 will be turned to adjust the positions of the nuts 11, so that when the toggles 15 are straightened, as shown in Fig. 1, the upper and lower blocks will be caused to move towards each other the required distance to effect the closing of the die to effect the engagement of the arcuate rounding surfaces 28 with the pipe to be rounded. Pressure fluid will then be admitted into one end of the fluid pressure cylinder 20, so as to cause outward movement of the piston rod 19 and the cross-head 18 carried thereby. This outward movement of the cross-head 18 will effect, through the links 17, breaking of the toggles 15 and consequently the opening of the die. The end of the pipe to be operated upon will then be inserted between the rounding blocks and pressure fluid admitted to the opposite end of the cylinder 20 to cause inward movement of the piston rod 19 to thereby effect a straightening of the toggles 15 to close the die and bring the rounding blocks into engagement with the pipe. Rotation of the pipe will then be effected in the usual manner. The desired pressure of the rounding blocks may be maintained upon the rotating pipe by turning the hand wheel 14.

The advantages of the invention arise from the provision of a rounding mechanism in which the upper and lower rounding blocks are both movable, and in which means is provided for adjusting the path of movement of each of said blocks.

Further advantages of the invention arise from the provision of a floating support for the rounding die, which permits the rounding die to have a substantially universal movement in a plane normal to the longitudinal axis of the pipe being rounded, whereby the severe strains which are imposed upon the bed plate and carriage of the usual type of rounding mechanism during the rounding of a pipe, which is not straight, are avoided.

While I have shown and described a rounding mechanism in which both rounding blocks are pivotally mounted, and each actuated by a toggle, it will be apparent that it may be desirable in certain cases to have one of the rounding blocks stationary and the other pivotally mounted, with provision for adjustment of its pivot, and operated either by a cam, eccentric, toggle or other well known form of operating and locking means. Such a construction is within the purview of the appended claims.

I claim:

1. Rounding mechanism comprising a plurality of pivoted rounding blocks, means for simultaneously adjusting the pivots of all of the blocks in a plane normal to the axes of the pivots and the article to be rounded, and other means for simultaneously moving all of the blocks in said plane, to move the said blocks into and out of operative position, substantially as described.

2. Rounding mechanism comprising a plurality of pivoted rounding blocks, means for simultaneously adjusting all of the pivots of the blocks in a plane normal to the axis of the article to be rounded, and a pair of toggle levers for each block for simultaneously moving all of the blocks in said plane, to move the said blocks into and out of operative position, substantially as described.

3. Rounding mechanism comprising two cooperating pivoted rounding blocks, means for moving both of said blocks toward and from each other in a plane normal to the axis of the article to be rounded to effect movement thereof into and out of operative position, and means at the pivoted ends for simultaneously adjusting the path of travel of both of said blocks about the axis of the article to be rounded, substantially as described.

4. Rounding mechanism comprising a plurality of cooperating rounding blocks, at least one of said blocks being pivotally mounted about an axis substantially parallel to the axis of the article to be rounded, means for adjusting the axis of said block toward and from the axis of the article, and means for rocking said block about its pivotal mounting to effect the movement thereof in a plane normal to the axis of the article to be rounded to move said block into and out of operative position, substantially as described.

5. Rounding mechanism comprising a plurality of cooperating rounding blocks, at least one of said blocks being pivotally mounted about an axis substantially parallel to the axis of the article to be rounded, means for adjusting the axis of said block

toward and from the axis of the article, and toggle means for rocking said block about its pivotal mounting to effect movement thereof in a plane normal to the axis of the article to be rounded to move said block into and out of operative position, substantially as described.

6. Rounding mechanism, comprising a rounding die consisting of a pair of oppositely facing rounding blocks, each of said blocks being pivotally mounted, means for rocking said blocks about their pivotal axes to effect movement thereof towards and from each other, and means for simultaneously adjusting the positions of the pivots of said blocks to thereby vary the extent to which the die is closed when actuated by said first mentioned means, substantially as described.

7. Rounding mechanism, comprising a rounding die consisting of a pair of oppositely facing rounding blocks, each of said blocks being pivotally mounted at one end, means for simultaneously adjusting both of said pivots, a toggle connected to the opposite end of each block, and means for simultaneously actuating said toggles to effect movement of said blocks towards and from each other, substantially as described.

8. Rounding mechanism, comprising a rounding die consisting of a pair of oppositely facing rounding blocks, each of said blocks being pivotally mounted at one end, a toggle connected to the opposite end of each block, means for simultaneously actuating said toggles to effect movement of said blocks towards and from each other, and means for moving the pivots of said blocks towards and from each other to thereby shift the paths of travel of said blocks when actuated by said first mentioned means, substantially as described.

9. Pipe rounding mechanism, comprising a floating carriage, a support on the carriage adapted to be moved by the pipe during the rounding, a plurality of cooperating blocks carried by said support, and means other than the support for effecting relative movement of said blocks towards and from each other, substantially as described.

10. Rounding mechanism, comprising a plurality of cooperating rounding blocks, means for actuating said blocks to effect movement thereof into and out of operative position, a carriage and a support for said blocks slidably mounted on the carriage for permitting universal movement thereof in a plane substantially normal to the axis of the material being rounded, substantially as described.

11. Rounding mechanism comprising a plurality of cooperating rounding blocks, a support, at least one of said blocks being pivotally mounted on the support, means for rocking said block about its pivotal mounting to effect movement thereof into and out of operative position, a carriage, and connecting means between the support and carriage for permitting universal movement of said blocks and support relative to the carriage in a plane substantially normal to the axis of the material being rounded, substantially as described.

12. Pipe rounding mechanism comprising a carriage, a support floatably mounted on the carriage to permit movement of the support on the carriage in a plane normal to the axis of the pipe being rounded, a split die formed of two blocks, a nut pivotally connected to one end of each block, a screw mounted on the support engaging the nuts for simultaneously adjusting one end of each block, and means mounted on the support and connected to the opposite ends of the bocks for moving the blocks toward and from each other, substantially as described.

13. Pipe rounding mechanism comprising a carriage, a support floatably mounted on the carriage to permit movement of the support on the carriage in a plane normal to the axis of the pipe being rounded, a split die formed of two blocks, a nut pivotally connected to one end of each block, a screw mounted on the support engaging the nuts for simultaneously adjusting one end of each block, toggle lever mechanism mounted on the support and connected to the opposite ends of each of the blocks, and fluid pressure means mounted on the support and connected to the toggle lever mechanism for moving the blocks toward and from each other, substantially as described.

14. Rounding mechanism, comprising a plurality of cooperating rounding blocks, at least one of said blocks being pivotally mounted, means for rocking said block about its pivotal mounting to effect movement thereof into and out of operative position, means for changing the position of the pivotal axis of said block toward and from the other block to thereby shift the path of travel thereof when actuated by said first mentioned means, and supporting means for said blocks permitting substantially universal movement thereof in a plane substantially normal to the axis of the material being rounded, substantially as described.

15. In a pipe rounding machine, a carriage, a floating support mounted on the carriage, a rounding die carried by the support, and die opening and closing means carried entirely by the support for moving the die relative to the support and the pipe to be rounded, whereby the die is free to move with the pipe to a limited extent relative to the support in any direction normal to the axis of the pipe during the rounding operation without affecting the opening and closing means, substantially as described.

16. In a pipe rounding machine, a carriage, a floating support mounted on the car-

riage, a rounding die carried by the support, hand operated means for opening and closing the die carried by the support, and power operated die opening and closing means carried entirely by the support for moving the die relative to the support and the pipe to be rounded, whereby the die is free to move with the pipe to a limited extent relative to the support in any direction normal to the axis of the pipe during the rounding operation without affecting the opening and closing means, substantially as described.

In testimony whereof I have hereunto set my hand.

EDGAR H. WILSON.