

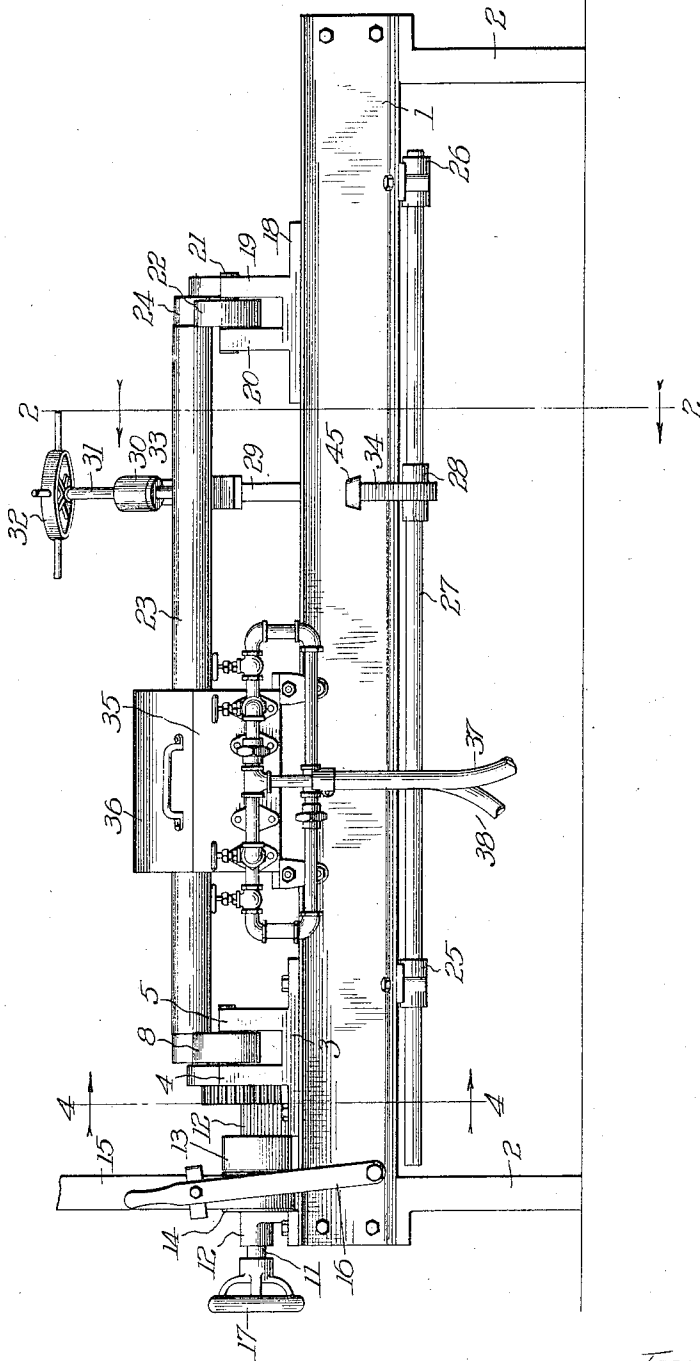
J. ROWE.
TUBE STRAIGHTENING MACHINE.
APPLICATION FILED SEPT. 29, 1911.

1,060,365.

Patented Apr. 29, 1913.

2 SHEETS—SHEET 1.

FIG. 1.



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Inventor
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1,060,365.

2 SHEETS—SHEET 2.

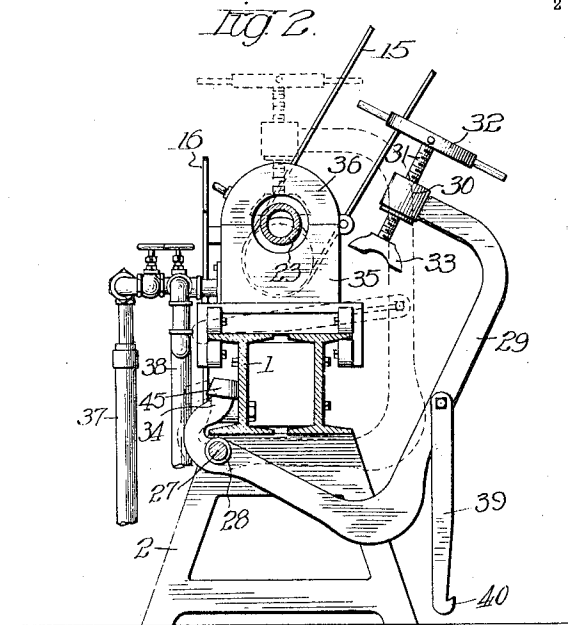


Fig. 3.

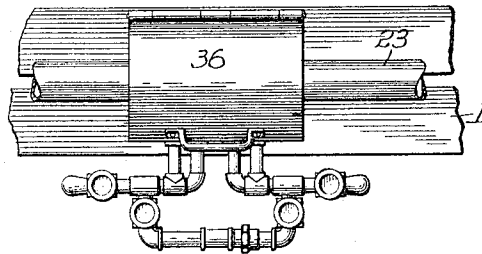
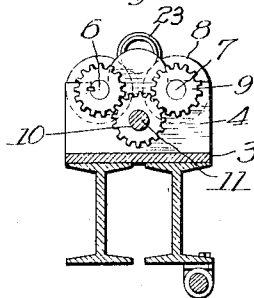


Fig 4.



Witnesses:

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Att'y.

UNITED STATES PATENT OFFICE.

JAMES ROWE, OF CHICAGO, ILLINOIS.

TUBE-STRAIGHTENING MACHINE.

1,060,365.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed September 29, 1911. Serial No. 651,970.

To all whom it may concern:

Be it known that I, JAMES ROWE, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tube-Straightening Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object to provide a simple and efficient machine for straightening tubing and the like, and consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings illustrating the invention: Figure —1— is a view in side elevation of a machine embodying my invention. Fig. —2— is a vertical transverse section of the same on the line 2—2 of Fig. —1—. Fig. —3— is a fragmentary detail plan view of the same showing the position of the furnace and connections therewith for heating the pipes preparatory to bending the same. Fig. —4— is a fragmentary detail vertical section on the line 4—4 showing the means employed for rotating the tubes preparatory to ascertaining the points at which the same is bent.

The particular object of my invention is to provide a machine for straightening tubes which is very simple and cheap and is easily operable to straighten tubes of different lengths and diameters.

The machine comprises a bed 1 which may be conveniently constructed of two I-beams, or the like, disposed parallel with each other and which are mounted upon end supports 2 in any convenient manner to bring the upper surface of said bed the requisite elevation to render the operation of the machine convenient. On this bed there is rigidly mounted adjacent one end a member 3 comprising a flat plate equipped with two parallel vertical standards 4 and 5 respectively. The said standards 4 and 5 are equipped in their upper ends with recesses in which the shafts 6 and 7 are removably journaled, each of the latter being equipped between its ends with a removable roller 8 and each equipped at one end with a spur gear 9. Said spur gears mesh with a single spur gear 10 mounted upon the shaft 11 journaled in bearings 12 mounted upon the end portion

of the bed 1 carrying the plate 3. The said shaft 11 carries a tight and a loose pulley 13 and 14, respectively, between its ends and is rotated by means of the belt 15 which is shifted by a belt-shifting lever 16 in the usual and well-known manner. The said shaft 11 is also equipped at one end with a hand-wheel 17 by means of which it may be rotated for purposes hereinafter set forth.

Slidably mounted upon the bed 1 of the machine adjacent the other end of the same is a plate 18 similar to the plate 3 which is also provided with parallel vertical flanges or standards 19 and 20 which are similarly provided in their upper edges with recesses to receive shafts 21, each of which is provided between its ends with a roller 22, said rollers 8 and 22 being always of the same diameter though interchangeable with rollers of smaller or larger diameter as may be required.

By means of the mechanism above described a tube 23 which has been previously turned off externally at its ends in a lathe, as at 24, to provide circumferential end surfaces truly concentric with the axis of the tube, is rotated, the said end portions 24 resting upon the pairs of rollers 8 and 22, respectively, and being rotated by frictional contact with the said rollers 8. During the rotation of said tube the operator by means of machinists' chalk or other marking material marks upon the circumferential wall of the tube between the ends thereof, the portions which are not truly concentric with the axis of rotation which also constitutes the true axis of the tube and after having so marked the same at one or more points discontinues the rotation by shifting the belt 15 and thereupon effects the straightening of the tube so as to render all parts thereof practically truly concentric with the axis of rotation, this being accomplished in the following manner: Journaled in bearings 25 and 26 secured to the lower face of the bed 1 is a shaft 27 upon which a sleeve 28 is mounted which is longitudinally and rotatably movable thereon. The said sleeve 28 is rigid with one end portion of a substantially U-shaped arm 29 and is disposed adjacent the free end of one of the arms thereof. The other arm of said U-shaped member 29 carries an internally threaded sleeve or hub 30 in which the screw shaft 31 is engaged, the latter being equipped with a hand-wheel 32 rigid therewith and carry-

ing a concavo-convex block 33 rotatably engaged therewith and interchangeable for engaging tubes of different diameters. The said member 29 is provided at its other end
 5 contiguous to its connection to said sleeve 28 with a projection 34 carrying an anti-friction roller 45 which is adapted, when said member 29 is in the position shown in full lines in Fig. —2—, to bear upon the
 10 web of one of the I-beams of the bed to support said member in the said position; the same being adapted to be swung to the position shown in dotted lines in Fig. —2—, to bring the said block 33 in vertical alignment and engagement with the tube 23 for
 15 the purpose of exerting a pressure upon the latter for straightening the same, as will be obvious.

A furnace 35 having a hinged cover 36 is longitudinally movable upon the bed 1, the same being connected by means of a flexible tube 37 with a source of supply of combustible gas under pressure and by means of another flexible tube 38 with a source of supply of air under pressure which said gas and air are introduced into the furnace in the usual and well-known manner to produce a high temperature within the same, suitable valves being provided for controlling the supplies of air and gas respectively, in any usual and well-known manner, and as clearly illustrated in the drawings. The cover 36 of the furnace is adapted to be turned back for the purpose of enabling a tube 23 to be inserted in the machine and furthermore to permit access to every portion of the circumferential surface of the tube 23 for the purpose of marking the same during primary rotation. After
 40 having marked the tube and determined exactly at which points the circumferential surface is not truly concentric with the axis of rotation the operator closes the furnace after having ignited gas introduced into the same and then moves it to that point in the length of the tube 23, which requires bending; it being understood, of course, that the tube will previously have been turned by means of the hand-wheel 17 to bring uppermost those portions of the surface which are farthest removed from the axis of rotation of the tube. By means of the furnace the tube is heated to the requisite temperature to enable the same to be easily bent and, after having so heated the same, the said furnace is moved longitudinally of the bed 1 away from the heated portion of the tube and the member 29 is then moved to bring the block 33 opposite such heated portion.
 60 The said member 29 is then moved to the position shown in dotted lines in Fig. —2— and by means of the hand-wheel 32 the block 33 is brought to bear upon the tube to bend the same by forcing down the highest portion in the surface thereof the requisite dis-

tance until it shall be just as far removed from the axis of rotation as the diametrically opposite portion of the surface thereof. This operation is repeated at various points between the ends of the tube until the same shall be as accurately as possible concentric at every point with the axis thereof.

It is, of course, requisite that the machine be adapted to tubes of different diameters and that each tube shall be supported at substantially the same elevation above the bed 1. To this end the rollers 8 and 22 are rendered interchangeable so that when a tube of smaller diameter is to be straightened larger rollers 8 and 22 are employed and when the tubes of larger diameter are to be straightened smaller rollers are employed.

The rollers 8 are removable from the shafts 6 and 7 and are held against rotation relatively to the same by means of keys, set screws or the like, the gears 9 and 10 employed being always the same and being rigid with the shafts 6 and 7.

An arm 39 is pivotally secured at one end to the arm 29 between the ends of the middle leg of the latter and is adapted when said arm 29 is turned to the position shown in dotted lines in Fig. —2—, to be swung to extend over the supporting bed of the machine, a projection or hook 40 on the free end of said arm 39 being adapted to engage the edge of the bed to support said arm 29 in position to maintain the block 33 in engaging position relatively to the tube to be straightened.

My said machine is very simple and efficient.

I claim as my invention:

1. A machine of the kind specified, comprising a supporting bed, means thereon for rotatably supporting a tube, means for rotating said tube, a member movable longitudinally of said bed and pivotally movable on an axis parallel with the axis of rotation of said tube, an arm on said member adapted, when the same is turned in one direction, to overhang the supported tube, a screw-shaft mounted in said arm and adapted when rotated to turn and move longitudinally on an axis perpendicular to the axis of rotation of said tube and to bear on the latter to bend the same, and a block interposed between the circumferential wall of the tube and the end of said screw-shaft and rotatable relatively to the latter for distributing the pressure exerted thereby, said member adapted to be turned on its pivot to throw said screw-shaft out of operative relation to the tube.

2. A machine of the kind specified, comprising a supporting bed, means thereon for rotatably supporting a tube, means for rotating said tube, a furnace slidable on said bed and through which the tube passes between its ends, a shaft carried by said bed

and extending longitudinally thereof, an arm slidable on said shaft and adapted to swing on the axis thereof, a manually operable screw-shaft mounted in said arm, and a block adapted to rest on the tube and adapted to be engaged by said screw-shaft to bend the tube.

3. A machine of the kind specified, comprising a supporting bed, a device for rotatably supporting one end of a tube mounted on one end of said bed and operable to rotate said tube, a device for rotatably supporting the other end of said tube, one of said devices movable longitudinally of said bed, a furnace slidable on said bed and through which the tube passes between its ends, a shaft carried by said bed and extending longitudinally thereof, an arm slidable on said shaft and adapted to swing on the axis thereof, a manually operable screw-shaft mounted in said arm, and a block adapted to rest on the tube and adapted to be engaged by said screw-shaft to bend the tube.

4. A machine of the kind specified, comprising a supporting bed, a member thereon equipped with two parallel shafts, a drive shaft geared thereto, rollers interchangeably mounted on said shafts and adapted to rotatably support one end of a tube, a carriage longitudinally movable on said bed, rollers interchangeably mounted thereon and adapted to rotatably support

the other end of said tube, a furnace slidable on said bed and through which the tube passes between its ends, and manually operable means slidable relatively to said bed and adapted to bear upon said tube to bend the same.

5. A machine of the kind specified, comprising a supporting bed, a member thereon equipped with two parallel shafts, a drive shaft geared thereto, rollers interchangeably mounted on said shafts and adapted to rotatably support one end of a tube, a carriage longitudinally movable on said bed, rollers interchangeably mounted thereon and adapted to rotatably support the other end of said tube, a furnace slidable on said bed and through which the tube passes between its ends, a shaft carried by said bed and extending longitudinally thereof, an arm slidable on said shaft and adapted to swing on the axis thereof, a manually operable screw-shaft mounted in said arm, and a block adapted to rest on the tube and adapted to be engaged by said screw-shaft to bend the tube.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

JAMES ROWE.

Witnesses:

RUDOLPH WM. LOTZ,
M. M. BOYLE.