May 12, 1931. C. F. SCHULTIS 1,804,815

MACHINE FOR DEFORMING PIPES

Filed Feb. 11, 1928 3 Sheets-Sheet 1

Fig. 1.

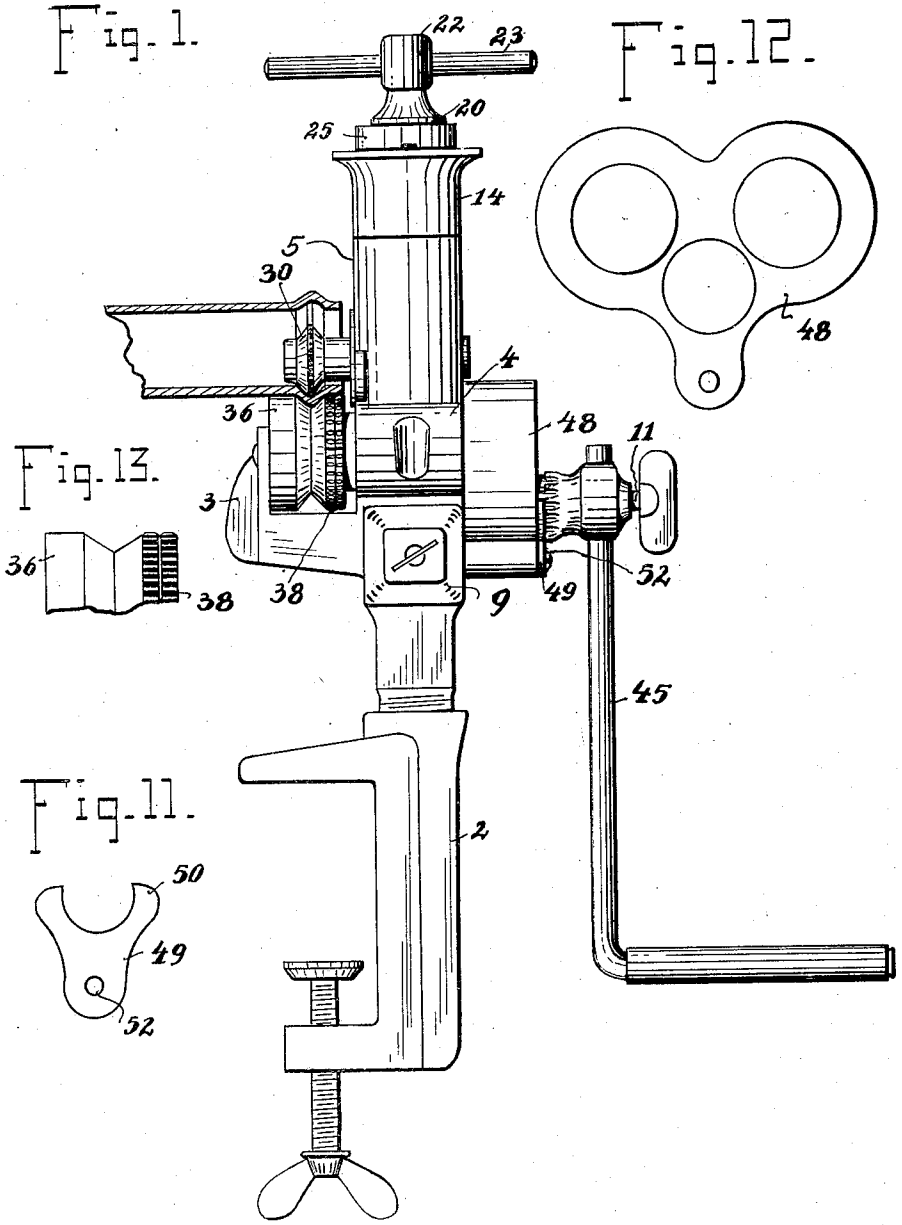


Fig. 12.

Fig. 13.

Fig. 11.

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MACHINE FOR DEFORMING PIPES

Filed Feb. 11, 1928 3 Sheets-Sheet 2

Fig. 2.

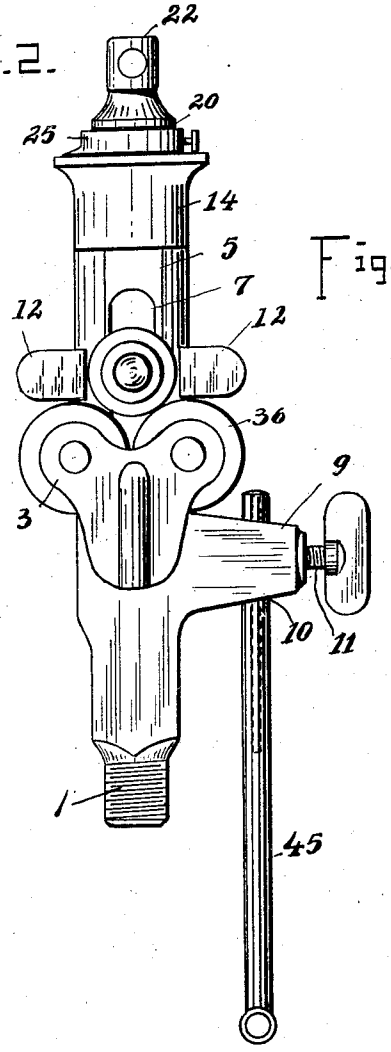


Fig. 4.

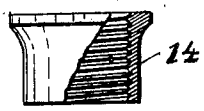


Fig. 3.

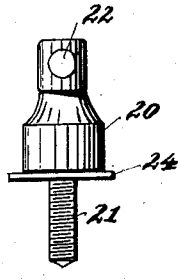


Fig. 5.

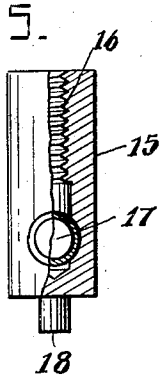


Fig. 6.

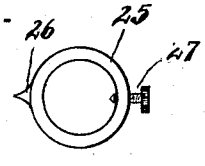
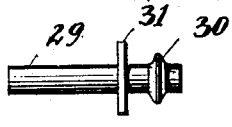


Fig. 7.



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May 12, 1931. C. F. SCHULTIS 1,804,815

MACHINE FOR DEFORMING PIPES

Filed Feb. 11, 1928 3 Sheets-Sheet 3

Fig. 8.

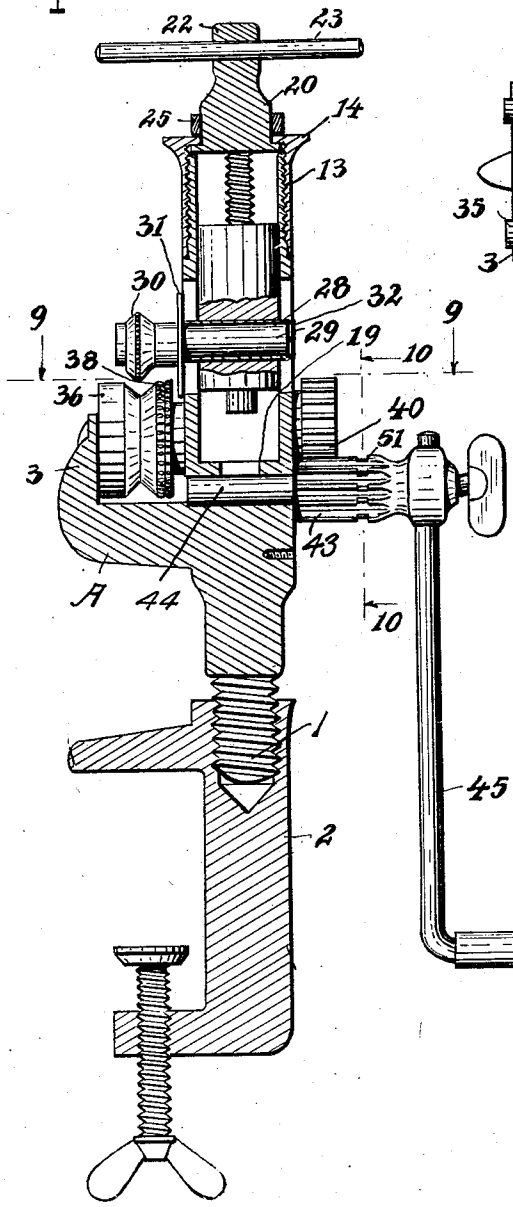


Fig. 9.

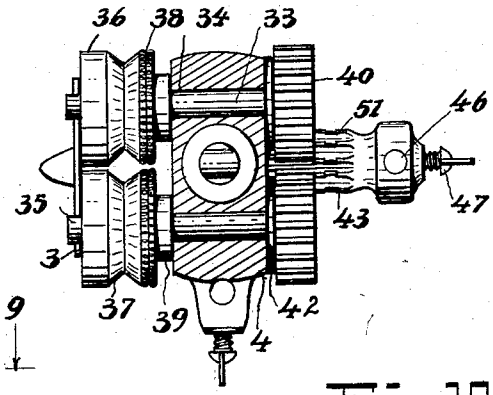
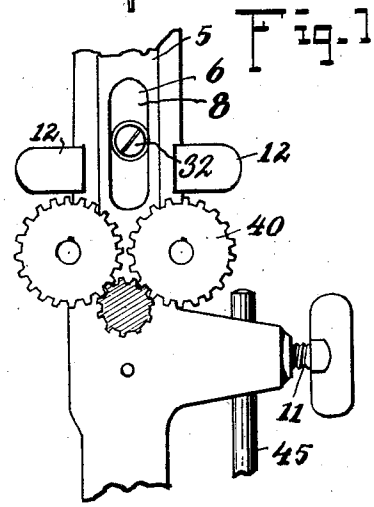


Fig. 10.



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Patented May 12, 1931 1,804,815

UNITED STATES PATENT OFFICE

CHARLES F. SCHULTIS, OF CLEVELAND, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE SIMPLEX COPPER JOINT COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

MACHINE FOR DEFORMING PIPES

Application filed February 11, 1928. Serial No. 253,590.

The primary object of this invention is to provide a machine for deforming the ends of pipes or tubes prior to the use of the same in a coupling of a type such that it is necessary to prepare the tube ends prior to their insertion in the coupling, by breaking down the metal adjacent the end of the tube to provide an annular V-shaped groove or bead which is later further deformed by the action of the coupling itself. It is this initial breaking down of the tube that enables the coupling to further deform the pipe end in the assembling of the parts of the coupling.

In carrying out my idea of providing a machine for breaking down the metal of a tube adjacent to an end thereof in order to provide an annular groove, I employ two main drive wheels properly positioned with respect to one another and having V-shaped grooves in their peripheries. A comparatively small deforming wheel is positioned above and between the two drive wheels aforesaid, and is adjustable with respect thereto, the small wheel lying substantially above the V-shaped grooves in the driving wheels and being complemental to the said V-shaped grooves. Appropriate operating instrumentalities are provided for the driving of the wheels having V-shaped grooves therein and for the adjustment of the deforming wheel. This wheel is adapted to have a tube placed thereabout as it operates on the interior cylindrical surface of a tube or pipe to deform the same.

A particularly noteworthy feature of this invention is the adaptability of the machine to function in substantially two different ways in its operation of deforming tube ends. Appropriate clamping means are provided which may be availed of, on the appropriate occasion, to rigidly clamp the machine to any convenient working table or like article, and a tube is placed in position where it is operated on by the driving and deforming wheels aforesaid, the gears being rotated to cause rotation of the driving wheels. However, should it be desired to deform the end of a pipe already installed or in some position where it may not be brought to the machine, the clamping means may be dispensed with and a detachable operating member in the form of a crank handle is changed from one mounting in the machine to another. After proper positioning with respect to the tube end, the whole machine may be rotated around the pipe as a pivot to cause deformation of the latter in the manner intended, the operating member that adjusts the deforming wheel functioning in the same manner as in the previous case.

Still another object of the invention is to provide in a machine of the character referred to, means for indicating when a tube has been deformed to an extent previously determined upon. In carrying this thought out into practical operation, I employ screw means for adjusting the deforming wheel, and which screw means may have associated therewith an arrow or point that cooperates with suitable indicia to indicate the relation of the deforming wheel with respect to the main drive and supporting wheels.

Further more detailed objects and advantages will in part become apparent and in part be hereinafter stated such as the particular mounting of the adjusting means for the deforming wheel.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings, in which—

Figure 1 is a view in side elevation of a machine provided by this invention that is adapted to function while being clamped to a suitable support.

Figure 2 is a front view of the machine shown in Figure 1 that is now adapted for use without the clamping means, with the operating handle in a different position, that will cause rotation of the whole machine around a pipe as a pivot.

Figure 3 is a detail view in elevation of one of the parts of the mechanism used in adjusting the deforming wheel.

Figure 4 is another view in elevation of one of the parts.

Figure 5 is a detail view showing another one of the parts employed in the adjusting assembly for the deforming wheel.

Figure 6 is a detail plan view of the pointer or arrow indicating mechanism.

Figure 7 is a detail view in side elevation of the deforming wheel and its mounting.

Figure 8 is a section taken vertically through the entire machine, looking from the side.

Figure 9 is a horizontal section taken about on the line 9—9 of Figure 8.

Figure 10 is a back view taken about on the line 10—10 of Figure 8.

Figure 11 is a detail view of a gear housing employed in the construction of the machine.

Figure 12 is a detail view of the gear retaining means.

Figure 13 is a detail view in elevation, bringing out the groove and knurled construction of one of the driving wheels.

While a preferred embodiment of the invention is herein set forth, it is to be understood that I am not to be limited to the exact construction as herein described, because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claims.

A machine made in accordance with this invention comprises a main body portion or casting A which carries the various instrumentalities comprising the completely operative machine. The lower end of the casting A terminates in a screw threaded stem 1 that is adapted for insertion in a clamp 2 that is availed of when the machine is to be mounted on a work bench or similar article. The main casting A has upstanding ears 3 at the front thereof that constitute a journal or bearing for certain instrumentalities to be later described, and extending from each side are lugs 4 that provide journals in substantial alignment with the bores in the ears 3. The main casting A above the lugs 4 is of a hollow construction and has front and rear flat faces 5 and 6 that are slotted at 7 and 8. Extending in substantially the same plane with the lugs 4 is a projection 9 having an opening extending therethrough at 10 to provide a mounting for a handle crank which is held in the opening by a set screw 11. Guiding flanges 12 are integral with the main casting A and extend sidewise above the lugs 4 at the front face 5 of the main body. The upper portion of the main casting is exteriorly screw threaded at 13 and when the machine is completely assembled, a cap 14 is threaded thereon. The upper face of this cap may be provided with suitable indicia to cooperate with a point indicator to determine the position of the deforming wheel in a manner to be later described. A carrier member 15 is mounted for longitudinal movement in the bore of the main casting A and has a bore extending partway therethrough that is interiorly screw threaded as shown at 16. An opening 17 extends transversely across the carrier member 15 and carries a pivot member in a manner to be later set forth. The carrier member 15 may be provided with a guiding projection 18 at the lower extremity thereof that at times may fit in a recess 19 in the main casting.

Referring now to Figure 3, a screw member 20 has a threaded shank 21 screwed into the threaded bore 16. The upper extremity of the member 20 has a longitudinal opening 22 that receives an operating member in the form of a handle bar 23 that may be availed of for the purpose of rotating the member 20. A flange 24 on the member 20 is clamped on the upper end of the main casting A by the cap 13 in a position permitting of rotation of the member 20. A ring 25 having an arrow point 26 may be adjustably affixed to the member 20 through the medium of a set screw 27. The transverse opening 17 in the carrier member 15 is lined with a bearing sleeve 28 that functions as a journal for pivot member 29. Member 29 carries adjacent to its outer extremity a deforming wheel 30 of appropriate V-shaped configuration. The pivot 29 also has a positioning flange 31 that normally bears against one end of the journal sleeve 28. Pivot member 29 is held in the journal sleeve 28 by screw 32, the head of which bears against the other end of the said sleeve. It will be apparent from Figures 2 and 8 that the pivot members 29, the extremity of which projects into the slots 7 and 8, are adapted for longitudinal movement therein because of their mounting in the movable carrier member 15. The assemblage just described may be operated by proper rotation of the handle bar 23 to cause longitudinal movement of the deforming wheel 30 with respect to the casting A.

Main driving shafts 33 are journaled in the openings 34 in the lugs 4 and have their extremities at one end appropriately mounted in the ears 3 as shown at 35. Between the lugs 4 and the ears 3 the shafts 33 carry drive wheels 36. These drive wheels are provided with V-shaped grooves 37 and peripheral driving surfaces 38 that are notched or toothed to provide an engaging surface with the end of the tube operated on by the machine. Spacing washers 39 hold the drive wheels 36 in a position removed from the main casting A.

The shafts 33 extend through the lugs 4 and at their free ends carry driving gears 40 that are spaced from the main casting by spacing washers 42. Driving gears 40 are in engagement with a main driving gear 43 preferably integral with a pivot member 44 that has appropriate bearing in the main casting A. Main driving gear 43 may be operated through the medium of a crank handle 45 that is inserted in the opening 46

in the shaft forming a part of the gear, and is held therein by a set screw 47.

As previously mentioned, the machine is adapted for functioning in substantially two distinct ways. When it is clamped to a suitable stationary object by means of the clamp 2, the crank handle 45 is positioned in the opening 46 in the main driving gear and may be operated to cause rotation of the drive wheels 36. A pipe is positioned with respect to the machine so that the end thereof will abut against the positioning flanges 12 while it rests on the main driving wheels 36 and lies therebetween. In this position the deforming wheel 30 will be located interiorly of the tube. The handle bar 23 may now be availed of to operate the carrier 15 to move the deforming wheel down against the interior cylindrical surface of the tubular member operated on by the machine. The forming wheel is forced down tight against the wall of the pipe and the main driving wheel is rotated a few turns after which the deforming wheel 30 is again forced down against the metal of the tube, forcing the same into the V-shaped grooves 37. In this manner the metal of the tube is broken down to provide a substantially V-shaped annular bead circumferentially thereof.

When a pipe is installed, or for any other reason, cannot be properly positioned with respect to the machine when the same is affixed to a stationary object, the clamp 2 is dispensed with and the crank handle 45 inserted in the opening at 10. The tube end is then positioned in the usual manner with respect to the machine except that the machine is the movable part and the tube the stationary one, while formerly, the converse of this condition was true. The crank handle 45 may then be employed to rotate the whole machine around the tube end as a pivot. During the normal operation of the machine, it will take several tightenings of the deforming wheel against the metal by the handle bar 23 to properly break down the metal of the tube, and the pointer 26, in conjunction with the indicia on the cap member 14, may be availed of to indicate when the metal has been sufficiently deformed.

A gear housing 48 encloses the driving gears 40 and main gear 43, the gears being held in place by a retainer 49 having arms 50 extending into notch 51 in the cylindrical surface of the main driving gear 43. The retainer is affixed to the gear housing by a set screw as shown at 52, the housing being made fast to the main casting A.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent in the United States, is:—

1. A pipe deforming machine of the class described, comprising, in combination, pipe deforming instrumentalities, means for including an operating member in the machine to operate the deforming instrumentalities, and means permitting of the rotation of the whole machine to perform the deforming functions when the operating member is not included in the machine.

2. In a pipe machine of the class described, the combination with a main body portion, of pipe deforming instrumentalities including gear mechanisms, of means cooperating with the gear mechanisms, comprising a handle receiving member, and a second handle receiving member on the main body, the machine being adapted to function either through the operation of the gear mechanisms or by the rotation of the machine as a whole around the pipe around which the machine is operated.

3. In a pipe machine of the class described, the combination with main driving wheels and a pipe deforming wheel for creating a bead in a pipe operated on by the machine, of means for indicating the position of the deforming wheel with respect to the driving wheels.

4. In a pipe machine of the class described, the combination with main driving wheels having a surface adapted to positively engage the exterior surface of a tubular member, and a deforming wheel adapted for movement interior of the tubular member operated on by the machine, of a carrier member for the deforming wheel, screw means for moving the carrier member, and means to indicate the position of the deforming wheel with respect to the main driving wheel.

5. A pipe machine of the class described, comprising, in combination, driving wheels adapted to support and impart rotation to a tubular member, a deforming wheel adapted for movement in the tubular member, the driving wheels having V-shaped grooves therein, means for causing movement of the deforming member to force the metal of the tubular member into the driving wheels, and gear mechanism for rotating the driving wheels, the machine being adapted for operative rotation as a unit around the tubular member upon which it is operated.

In testimony whereof I affix my signature.

CHARLES F. SCHULTIS.