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MACHINE FOR CUTTING AND CRIMPING CYLINDERS OF SHEET METAL.
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1,130,677.

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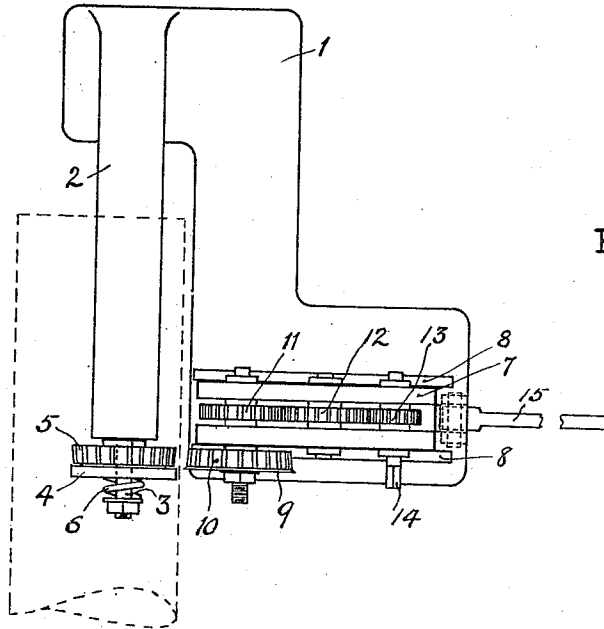


Fig. I.

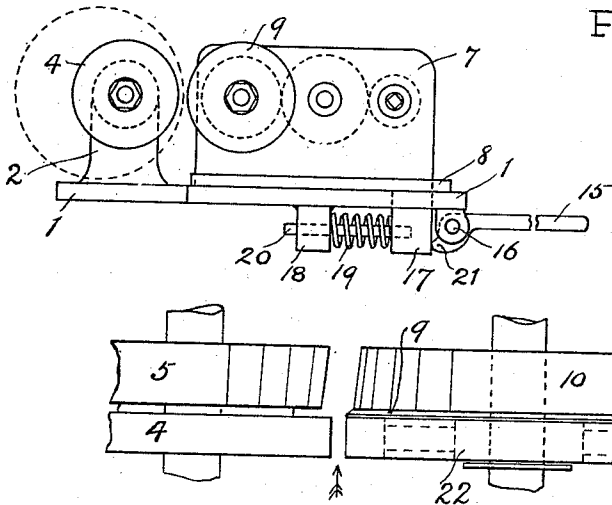


Fig. II.

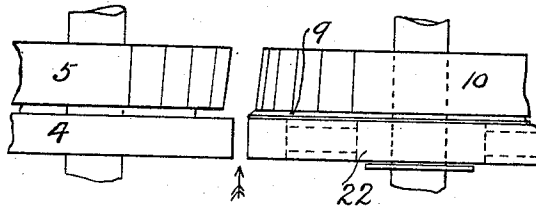


Fig. III.

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MACHINE FOR CUTTING AND CRIMPING CYLINDERS OF SHEET METAL.

1,130,677.

Specification of Letters Patent.

Patented Mar. 2, 1915.

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To all whom it may concern:

Be it known that I, CHARLES HARVEY PHINNEY, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Machines for Cutting and Crimping Cylinders of Sheet Metal, of which the following is a specification.

My invention relates to machines for cutting cylinders of sheet metal to length, at the same time crimping the severed end of the portion cut off; and it is especially designed for the cutting and crimping of stove pipe, or of similar light material.

Heretofore there has been great waste in the cutting of stove pipe. The pipe is either cut by means of hand operated shears or in a machine provided with rotary cutters. The pipe to be cut is crimped at one end; and from the other end it is desired to cut a portion so that the remainder may be of the desired length for the work in hand. The portion cut from the pipe is plain at both ends, and is of no use as stove pipe until one of its ends has been crimped; and this necessitates a second operation. Furthermore the piece cut off is often so short that it is not practicable to properly handle it in a machine so that it may be crimped.

The object of my invention is to overcome this difficulty and to save the waste, and I effect this by so arranging my cutting and crimping means that the portion severed from the main tube is crimped at the same time that it is cut. Consequently any length of pipe, no matter how short, that may be cut from the main pipe, is crimped at one end; and not only material, but a great deal of the time usually lost in the manufacture of stove pipe, is saved.

In the accompanying drawings, which form a part of this specification and in which like numerals refer to like parts, Figure 1 is a general view of the machine in plan; Fig. 2 is a view in elevation; and Fig. 3 is a detail view of the cutters and crimping rolls.

1 is a plate or frame of the machine adapted to be secured to a bench or other support. Upon this plate is mounted the arm 2 which carries at its free end a spindle 3 on which is mounted the inside cutter and crimping roll, 4 and 5. On the spindle 3 there is mounted a strong spring 6 to provide for

a small amount of relief between the two cutters. The bearing box 7 is mounted on the plate 1 and between guides 8, and it is arranged so that it may be brought toward and away from the cutter 4 and crimper 5. In this bearing box there are suitably mounted a cutter 9 and crimper 10. On the same shaft with these two there is mounted a spur gear 11, the teeth of which engage in the teeth of another spur gear 12, also mounted in the bearing box, and the teeth of which in turn engage with the teeth of the pinion 13, which pinion is also mounted in the bearing box. One end of the shaft upon which the pinion is mounted is prepared for receiving a crank and handle 14. It will be evident that when the spur 11 is revolved the cutter 9 and the crimper 10 will also revolve. The spur 12 and the pinion 13 are simply arranged so that sufficient power may be obtained, and so the crank handle may be brought to a convenient distance from the work.

When operating the machine the stove pipe to be cut is slipped over the cutter 4, and crimper 5, which are mounted on the arm 2; and in order that this may be done there must be a suitable space left between the said cutter and crimper and the cutter and crimper 9 and 10. The pipe having been placed in position, it is now necessary to bring the outside cutter and crimper into operation, and to do this I provide means, whereby the bearing box 7 may be caused to slide, in the guides 8, toward the work. This means may be of any of the well known types, such as the endless screw, the toggle, the lever, and others. To illustrate the operation of the machine I have shown a simple lever 15, mounted on a pin 16 attached to the under side of the plate 1. The block 17 is a part of the bearing box 7, and it extends through and below the plate 1. The block 18 is stationary and is rigidly attached to the under side of the plate 1.

19 is a spring by which the rod 20 is caused to act against the movable block 17; the rod 20 being slidably mounted in the fixed block 18.

Upon depressing the long arm of the lever 15 the short arm 21 will press against the movable block 17, and so move the bearing box 7 toward the fixed arm 2. Upon relieving the pressure on the lever 15 the spring 19 with the rod 20 will re-act against

block 17, and throw the bearing box 7 to the first position. By this simple means the pipe is engaged by and released from the cutters and crimpers. During the operation of cutting the pipe the action of the crimping rolls will cause the pipe to turn, and so present the surface continuously to the cutters.

The success of the operation of simultaneously cutting and crimping the same end of the piece of pipe depends very much upon the proper arrangement and adjustment of the cutting and crimping means. This is shown in detail in Fig. 3. 5 is the inside crimping roll and 4 the inside cutter. The pipe to be cut is passed over these in the direction indicated by the arrow. 10 is the outside crimping roll. In one end of this roll is set the beveled shear blade or cutter 9. The diameter of the two cutting rolls is such that they come into engagement with the pipe a little in advance of the crimping rolls. As soon as the crimping rolls bear upon the pipe they act as rollers causing the pipe to revolve between them, and so present its surface continuously to the cutters. With some classes of pipe it is desirable to cause the pipe to revolve as soon as the cutters begin to engage; and to effect this, I use on the outside of the cutter 9 a spring mounted roller 22. This roller is attached by means of the spring to the spindle upon which the cutter is mounted, and it is thus adapted to bear with an elastic pressure against the pipe, and to retain the same pressure while the cutters are passing through the material.

It will now be understood that after placing a piece of pipe in position, and operating my machine, the short piece cut from the main length will be crimped at that end at which it was severed from the main pipe; and that this will be the result, no matter how short the severed piece may be. It will be seen that this is an economical method of cutting pipe to length, or of cutting a number of thimbles, or of carrying out any other stove pipe operations.

Having described my invention, what I claim, and desire to protect by Letters Patent of the United States, is—

1. The combination, in a pipe cutting and crimping machine, of a fixed shaft, a rotary shaft adjustable with reference to the fixed shaft, a circular cutter loosely mounted at the free end of the fixed shaft, a rotary crimping wheel secured to the inner face of the said circular cutter, and of less diameter than the latter, a second circular cutter

loosely mounted on the rotary shaft, and arranged to cut against the inner edge of the first cutter, a second crimping wheel secured to the inner face of the second cutter, and of less diameter than the latter, means for revolving the second cutter and crimping roll, and means for bringing the second cutter and crimping roll into operating relation with the first cutter and crimping roll.

2. The combination, in a pipe cutting and crimping machine, of the frame, a fixed shaft, a rotary shaft carried in bearings slidably mounted on the frame and adjustable to and from the fixed shaft, a circular cutter mounted on the fixed shaft, a rotary crimping wheel secured to one face of the said cutter, a second circular cutter mounted on the rotary shaft, a second crimping wheel secured to the second cutter, means for revolving the second cutter and crimping wheel, and means for adjusting the position of the second cutter and crimping roll with reference to the first cutter and crimping roll.

3. The combination, in a pipe cutting and crimping machine, of two shafts approximately parallel with one another, one of the said shafts being arranged so that its position may be adjusted with reference to that of the other, cutting and crimping rolls mounted on each of the shafts, means for operating one of the cutting and crimping rolls, and means for changing the position of the movable shaft with reference to the position of the other shaft, to bring the rolls into operative relation with one another.

4. The combination, in a pipe cutting and crimping machine of two shafts approximately parallel with one another, one of the said shafts being arranged so that its position may be adjusted with reference to that of the other, cutting and crimping rolls mounted on each one of the shafts, means for operating one of the cutting and crimping rolls, means for bringing the said cutting and crimping rolls into operative relation with the other cutting and crimping rolls, and a feed roll elastically mounted with the operated cutting and crimping rolls, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES HARVEY PHINNEY.

Witnesses:

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