(No Model.)

J. P. KENNEDY.

MACHINE FOR CLOSING THE ENDS OF METAL TUBES.

No. 389,087. Patented Sept. 4, 1888.

Fig. 2.

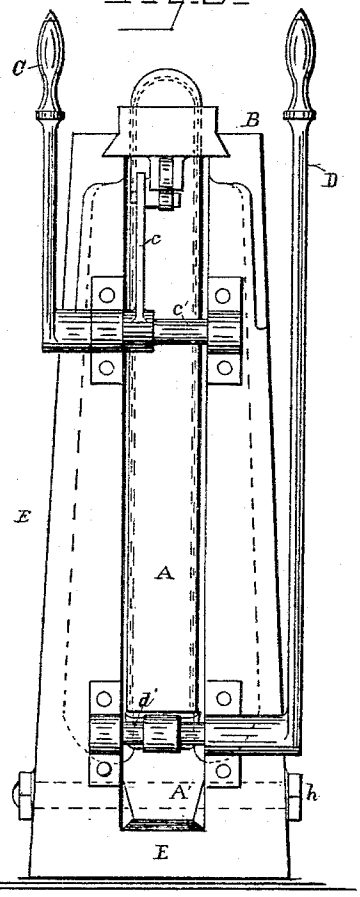
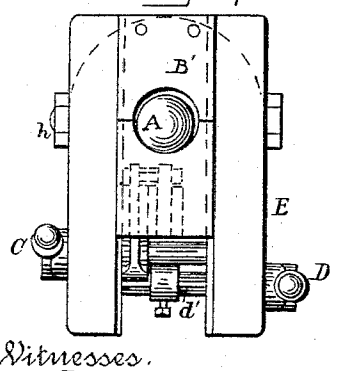


Fig. 3.



Fig. 1.

Fig. 4.



Witnesses.
E. B. Clark
John J. Haslett.

Inventor.
John P. Kennedy.
By E. B. Clark
Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN PATTERSON KENNEDY, OF NEW YORK, N. Y.

MACHINE FOR CLOSING THE ENDS OF METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 389,037, dated September 4, 1888.

Application filed May 26, 1888. Serial No. 275,189. (No model.)

To all whom it may concern:

Be it known that I, JOHN PATTERSON KENNEDY, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Machinery for Closing Ends of Metal Tubes; 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.

My invention consists in an improvement in power-hammers adapted to close and finish the ends of metal tubes by welding the metal upon itself.

The objects of my invention are, first, to furnish improved means for welding by machinery in a thorough and efficient manner the ends of tubes of metal; second, to provide a means for closing the ends of metal tubes, by which the metal at the end where the greatest strain or wear is sustained is made of uniform greater thickness; third, to provide machinery whereby a metal tube may be closed far more rapidly and at much less cost than by hand or other existing means; fourth, to provide means for finishing in a neat and uniform manner and at little expense the heads of tubes of metal after the same have been closed by machinery.

My invention is adapted to be applied to any efficient power-hammer. The method of its use is illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section through the anvil block or frame from front to rear, showing my invention applied. Fig. 2 represents a front elevation of the anvil of a power-hammer with my invention applied. Fig. 3 shows a tube as welded and finished by use of my invention. Fig. 4 is a plan view of the anvil-block, showing my attachments.

Similar letters refer to similar parts throughout the several views.

In the drawings, Fig. 1, E is the frame, clamped into position in the place usually occupied by the anvil-block, and G the chamber in which the mandrel A′ and the tube A are operated.

F indicates the die in place of usual hammer-block, to work over end of tube and mandrel.

C and D indicate levers, and *c* a lever-arm. Lever C connects with rock-shaft *c′*, to which is fixed the lever-arm *c*, and the latter connects by link *e* to lugs on under side of block B. Lever D connects with rock-shaft *d′*.

B and B′ indicate the two jaws, through which the mandrel is inserted and which divide, the one B sliding, as required, and the other remaining fixed, as shown in Figs. 1 and 4. The jaw B is provided with lateral flanges which fit in side grooves in top of frame, in which it slides.

The manner of operating the invention is as follows: The heavy frame of iron, E, is set vertically and firmly clamped into place in the position usually occupied by the anvil-block in a power-hammer. The mandrel A′ is provided with an elongated bolt-hole, through which bolt *h* is passed for pivotally securing it to the frame. The mandrel is placed directly under the center of the head which contains the cupped die F. This die block is capable of adjustment forward and backward, and the head of the hammer has a side adjustment, so that the die may be made to strike on the exact point desired. The upper end of the mandrel is rounded and flattened to something less than a spherical form, while the die F is shaped to admit half a hemisphere, which arrangement permits increased thickness of metal in the head of the tube. The lever C being drawn forward, the block B is by the same action thrown forward and the mandrel A′ drawn over into the position shown by the dotted lines. In this position the tube A, having its head first heated to the proper temperature, is slipped over the mandrel. The lever C, moving the block B, is thrown back, carrying the mandrel, with its enveloping-tube, against the stationary block B′. The lower end of the tube is supported upon the forked lever *d*. The hammer is now started, and with a few rapidly-recurring blows of the die the tube is brought to the proper shape. The difference in the shape of the die and upper end of mandrel causes the tube to be thicker at the end than elsewhere, according to desire. The hammer is now stopped and the lever C brought over, so as to bring the mandrel and its tube to the position indicated by the dotted lines. The lever D is brought over also in its movement, raising the tube from the mandrel by the forked lever *d*, and freeing it in such

manner as to admit of its being readily lifted off with a pair of tongs.

If it be desired to head a shorter tube than those ordinarily operated upon, a sleeve of sufficient length to extend from the top of the lever *d* to the lower end of the tube to be welded is slipped over the mandrel and used, while the shorter-length tube is being worked. By means of sleeves of varying lengths tubes of any length desired may be worked.

It is evident that the frame and chamber for holding the tube can be made of any length desired, so that long tubes may be operated upon.

A small jet of water is played upon the mandrel, when necessary, to prevent overheating, and by throwing a jet upon the hot end of the tube or into the die during the process of welding and subjecting the head when partly cooled to slight hammering with the cupped die the scale is removed and the head assumes a smooth finished appearance, almost as if it had been polished.

By this device tubes can be closed more certainly, uniformly, and rapidly, as well as more cheaply, than by hand. At the same time, owing to the compactness of the machinery, great economy of space is effected and less shop room required.

Different sizes of mandrels, dies, sliding blocks, &c., suitable for all sizes of tubes, may be manufactured and kept on hand, and the simplicity of the device admits of quickly changing it to meet varying demands.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed or operated, I claim and desire to secure by Letters Patent—

1. In a machine for closing the ends of tubes, the combination, with the hammer, of an anvil-block having a chamber, a mandrel placed vertically in said chamber, and the means for operating the mandrel, as described.

2. In a machine for closing the ends of tubes, the combination, with the hammer, of a chambered anvil-block, a vertical mandrel pivotally bolted at its lower end in the chamber of the block, and a sliding jaw in the top of the block, whereby the mandrel may be tilted forward for applying or removing a tube or be supported in a vertical position under the hammer head.

3. In a machine for closing the ends of metal tubes, the combination, with the chambered anvil-block and mandrel pivotally secured therein, of a forked lever embracing the mandrel and a lever for moving the mandrel in the chamber of the anvil-block, as described.

4. In a machine for closing the ends of tubes, the combination, with the hammer-block having a die adapted to work over a mandrel, of a chambered anvil-block, a mandrel placed vertically therein, a forked lever for raising a tube on the mandrel, and a lever connecting with a sliding jaw in the top of the anvil, as and for the purpose described.

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

JOHN PATTERSON KENNEDY.

Witnesses:
R. D. PLATE,
JOHN H. WILLIAMSON.