A. C. FYFE.

POMMELING MACHINE.

APPLICATION FILED MAY 22, 1908.

990,539. Patented Apr. 25, 1911.

Fig. 1.

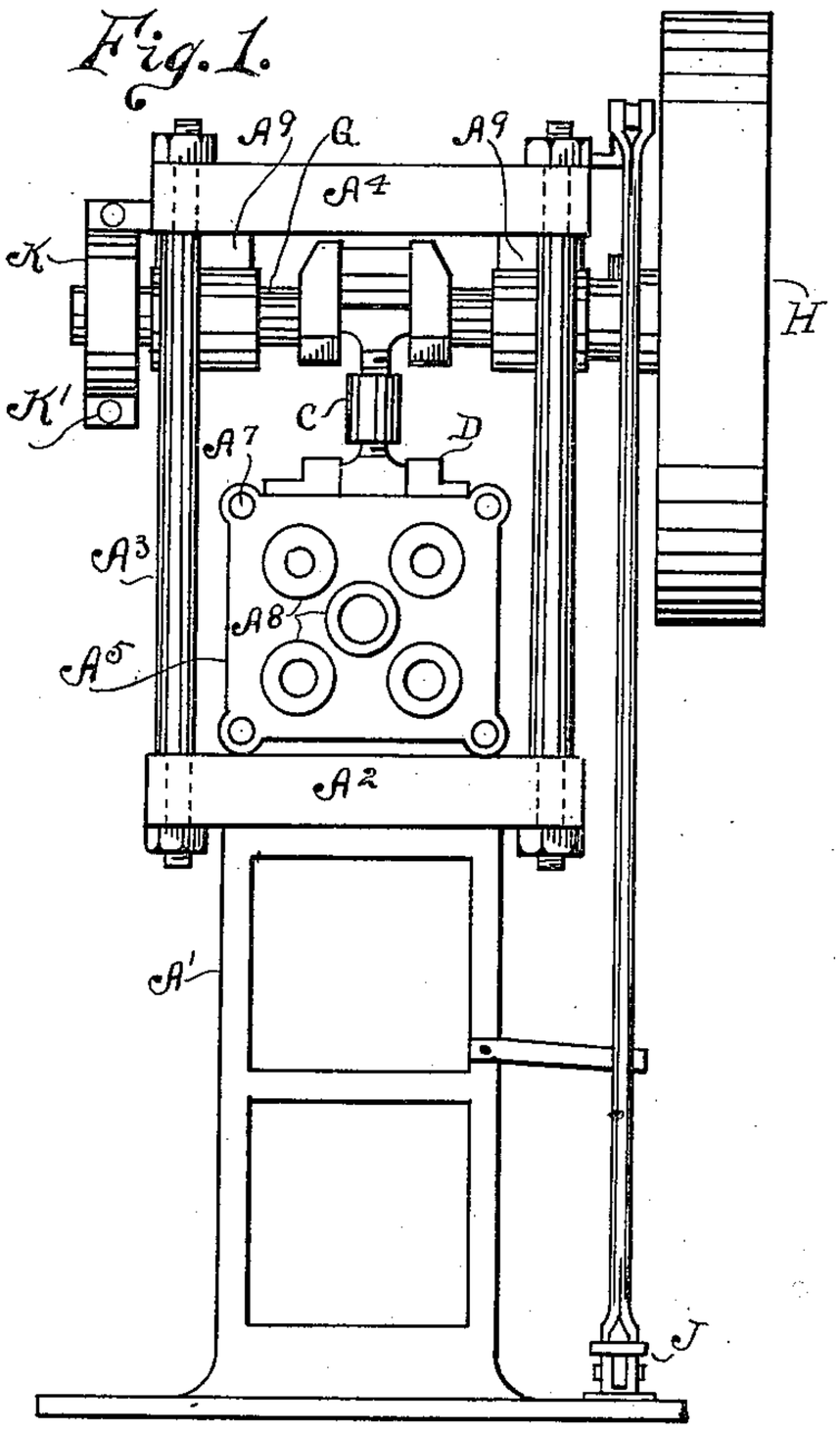


Fig. 2.

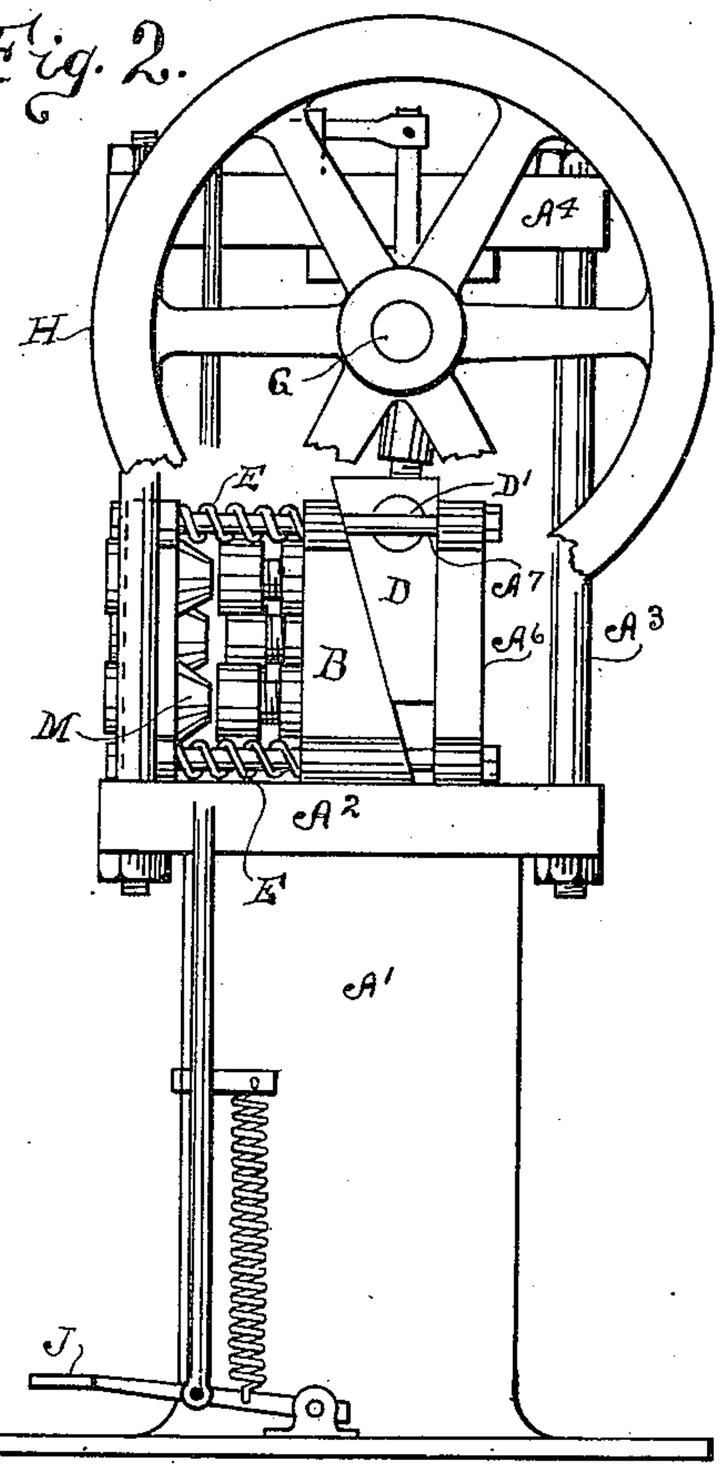


Fig. 3.

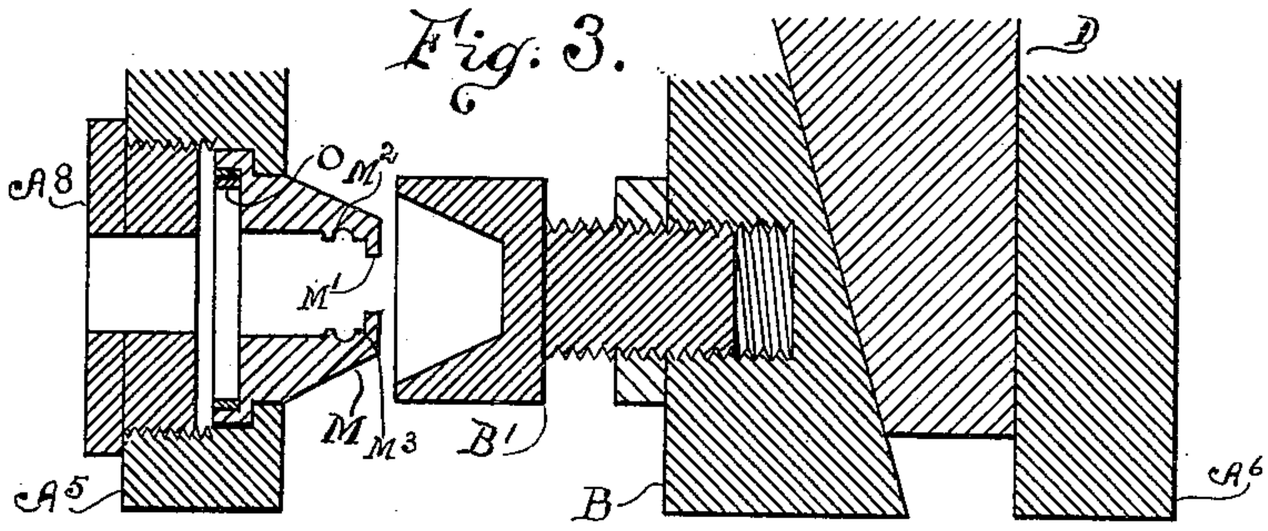


Fig. 4.

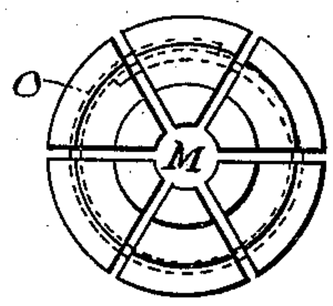
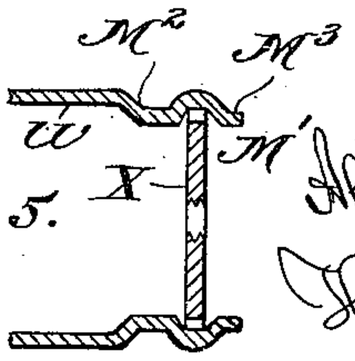


Fig. 5.



WITNESSES

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POMMELING-MACHINE.

990,539. Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed May 22, 1908. Serial No. 434,290.

To all whom it may concern:

Be it known that I, ALEXANDER C. FYFE, a citizen of the United States, residing in Weehawken, Hudson county, New Jersey, doing business in the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Pommeling-Machines or Clenching-Machines of Whatever Name Operating in a Similar Manner; and I do hereby declare that the following is a full and exact description thereof.

I use the term pommeling as it is known in the trade to indicate the compression radially of the ends of a tube to effect the required union of the tube with an annular piece of metal technically termed a gromet which is inclosed therein.

One of the uses to which my improved machine is applicable is the production of the proper ends on the tubes used in brass bedsteads. I will describe it as thus used and will assume that the tubes have been previously manufactured differing in diameter as usual and cut to the proper lengths, and that gromets of sizes to match in the ends of each of the several sets of tubes have also been made ready and have been inserted by a proper tool to the moderate depth required in each tube end, and held there temporarily.

The function of this machine is to receive the several tubes in succession each by an endwise thrust to the proper depth against a lip in the die serving as a gage, and subject it to one or more compressive actions causing the metal of the tube to be permanently reduced in diameter upon the rim of the gromet and adjacent thereto so as to give the required strong and rigid union. The fact that the union is afterward inclosed in ornamental work makes its smoothness of little importance but the junction can be of symmetrical appearance and is usually made so by the operator, who retains his hold by his hand on the tube, taking care to simply give it partial revolutions between the several compressions.

Machines for pommeling by this general mode of operation have been long known. My machine is a marked improvement especially in the facility of changing from the treating of one size of tube to another and back again. My machine is equipped with dies of the whole range of sizes to be treated. All the dies are operated at once by a single broad and deep wedge and all worked simultaneously and equally. The tubes may be brought to the operator in any order or in quantities variously mixed. Obviously the lengths may vary indefinitely and there is sufficient difference in the diameters of the tubes to allow the operator to distinguish at once without any necessity for care to keep the sizes separate. The dies though distributed over the whole area of the front plate are still near together and as all "look" in the same direction the operator does not require to change his seat or his attitude materially to treat all that are brought to him, thrusting each from the front into its proper die without stopping the machine or requiring any labor or delay.

I will describe the machine equipped for treating five different diameters of tubes,— the number may be greater if required.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a front elevation, and Fig. 2 is a side elevation with portions broken away. The remaining figures are on a larger scale showing parts detached. Fig. 3 is a vertical section of a single die and operating mechanism. It is a longitudinal vertical section. Fig. 4 is a view of one set of dies alone. Fig. 5 is on a still larger scale. It is a longitudinal section of a portion of a completed tube with letters of reference in place indicating the portions of the dies which have shaped the metal into the compressed condition shown.

Similar marks of reference indicate like parts in all the figures where they appear.

A′ is the bed or stand; A^2 a horizontal table preferably cast in one therewith; A^3 a series of uprights rigidly connecting the latter to a substantial top A^4 and A^5 and A^6 are stout vertical plates carried on the table between which the work for treating any and all the sizes of tubes is performed. The front plate A^5 carries the dies with freedom to be expanded and contracted.

A^7 are a series of straight horizontal bolts which perform the double function of stout ties connecting the plates A^5 and A^6 and of guides for a broad piece B which I will term the carriage having a short horizontal travel forward and backward. The back face of this carriage is beveled or inclined as shown

in Figs. two (2) and three (3) and is arranged to be driven strongly and squarely forward by a vertically moving wedge D which works, properly lubricated, between this carriage and the plate A^6. Each guide and bolt A^7 is inclosed in front of the carriage by a spring E urging the carriage squarely backward whenever the wedge D rises to allow such motion. The front face of the carriage is equipped with five adjustable pieces of hardened steel B′ each conically bored at its front end. See Fig. 3. I will term them cups.

The dies are sectional, shown as separated longitudinally into six sections but the number may be varied. I use the reference letter M for each entire die using supernumerals to designate special parts when necessary. The dies are arranged to match in positions the corresponding cups B′ and each is coned on its rear face. The sections of each die are urged apart radially, by springs O to be presently described, so as to make each die larger in diameter by a sufficient amount every time the carriage retreats. At each ascent of the wedge D the carriage is relieved from the strong and evenly distributed force which has previously urged it forward and retreats rearward under the force of springs E and all the cups release their several sectional dies, and the sections are free to separate. Thus conditioned the sections are spread apart by the action of springs O, one for each die. These springs are formed each by bending a thin strip of flat steel into a ring with its ends overlapping, held in a circular recess provided in each die as shown in cross section in Fig. 3 and the edge view in dotted lines in Fig. 4.

The several sections constituting the complete die and also the spring O therefor are held strongly but with liberty to enlarge and contract in the corresponding seat formed in the front plate A^5. Each is secured and released by a locking ring A^8 tapped in the front of each die seat. See Fig. 3. The interior of the die and the locking ring form collectively a guide for insuring the correct alinement of the tubes as they are successively thrust in from the front by the hand of the operator.

The work is done in the interior of the die which is for the time being in use. The construction is shown very clearly in Fig. 3 where M′ is an internal lip forming a reliable stop against which the tubes are successively thrust and pressed by the operator while subjected to the two or more inwardly compressive actions of the die, and M^2 and M^3 are respectively internal ridges which imprint themselves into the tube, the ridge M^2 on one side and the rim M^3 on the other side of the toothed gromet X. The tendency to make the pommeling slightly incomplete by leaving uncompressed metal at the joints between the sections is overcome by the partial revolution given by the operator to the tube W at each opening of the dies.

The movement of the wedge is a simple vertical reciprocation. A belt from a steam engine, or other efficient motor, not shown, running on a pulley H,—serving also as a fly-wheel, revolves a stout horizontal shaft G carried in well supported bearings A^9 and gives motion to the wedge, through a connecting-rod C and a pivot D′.

The wedge D is wide and deep, and the fixed front plate A^5 and the yielding carriage B between which it moves, are correspondingly extended. The force received through the link or connecting rod C is directly applied at each of the five widely distributed holes where the dies M are located. The wedge acts directly in driving forward the carriage B with all its cups B′ in line with the several holes, with each descent, but it is required to produce useful effect in only one die at a time. It is ready to thus serve for either of the dies and the action is direct in each.

A workman accustomed to turn the plates in a nail machine or who has by any other means trained himself to keep time and be prompt and decided in the movements imparted by his hands, could operate the machine successfully with the fly inseparably fixed to the shaft thus making an opening and closing movement of the dies at each revolution, and it might be easier on the man to thus work sometimes, but I have provided a clutch and treadle and brake causing the action to ensue only when the treadle is depressed, which I have shown and will now describe.

The wheel H runs loosely on the shaft G connected by a clutch I of a style long used in analogous intermittently acting machines effecting an engagement at will by the aid of a lever operated by a rod connected to a treadle J. See Fig. 2.

A brake K embraces the shaft G or a wheel thereon and offers a constant resistance adjustable by turning a screw K′ thereon which induces a rapid stopping of the revolutions of the shaft immediately after each release by the clutch.

Modifications may be made by any good mechanic without departing from the principle of sacrificing the advantages of the invention. Features may be added or omitted. I prefer to make the gromets with teeth around the edges and without the circumferential groove in the mid thickness of the edge and to operate without the crushing inward of the inclosing metal to engage such groove which is usually considered necessary. These qualities contribute to the power of the gromet to withstand the tendency to rotate in the tube when subjected to great force in withdrawing it by a screw

inserted in the tapped central hole when required.

Means may be provided for automatic lubrication but I prefer the whole about as represented for general work.

I claim as my invention:

In a machine for pommeling tubes, a support provided with a series of recesses, a segmental die fitted loosely within each of said recesses, a flanged ring screw-threaded into each of said recesses, said rings serving the double function of guides to, and retainer for said dies substantially as specified.

Signed at New York N. Y. this 20 day of May 1908.

ALEXANDER C. FYFE.

Witnesses:
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WILLIAM E. GLADSTONE.