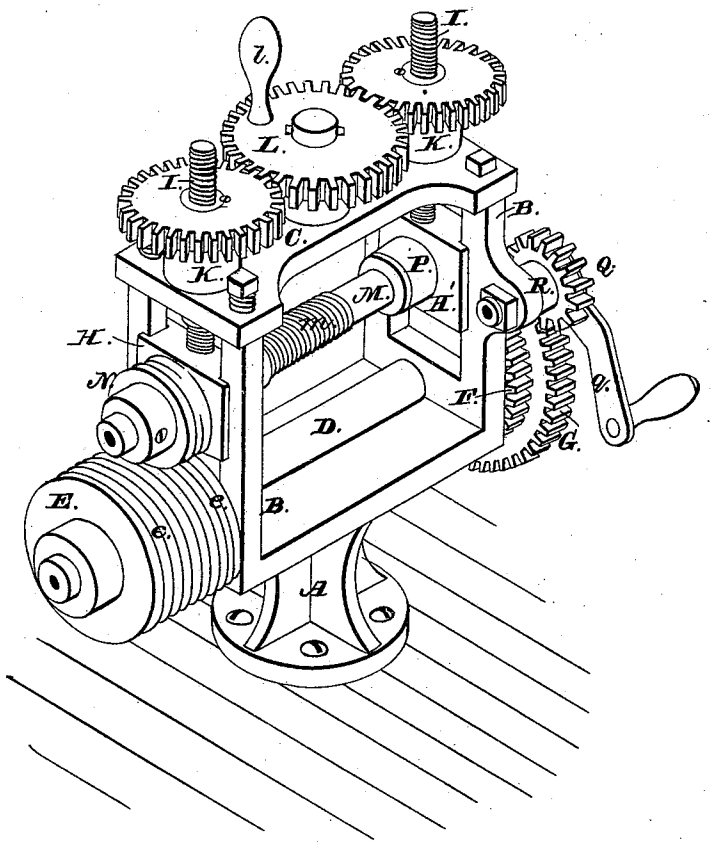
(Model.) 3 Sheets—Sheet 1.

W. W. CRANE.

MACHINE FOR THREADING SHEET METAL PIPES.

No. 250,209. Patented Nov. 29, 1881.

Fig. 1.



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Fig. 2.

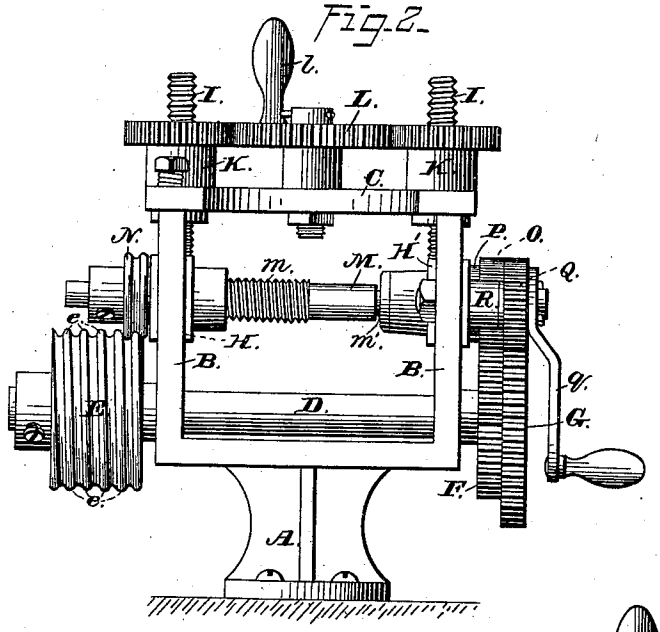


Fig. 3.

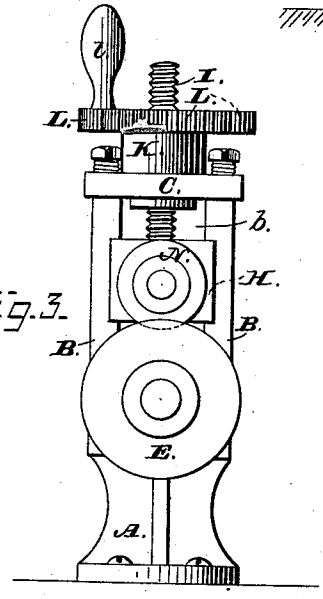


Fig. 4.

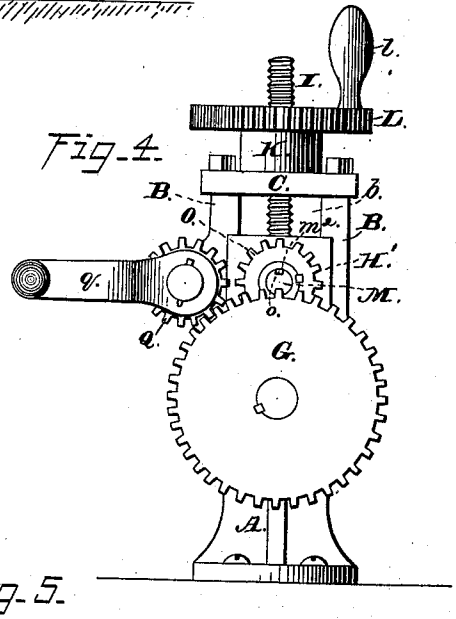
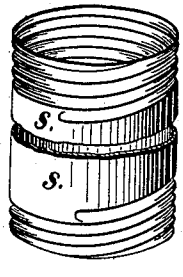


Fig. 5.



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Fig. 6.

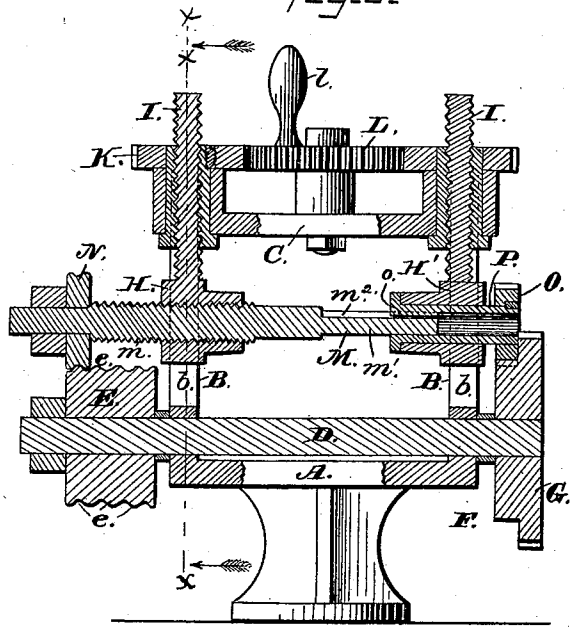
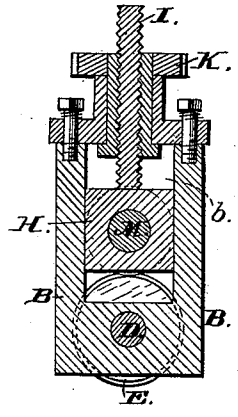


Fig. 7.



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UNITED STATES PATENT OFFICE.

WELLSLY W. CRANE, OF AUBURN, NEW YORK.

MACHINE FOR THREADING SHEET-METAL PIPES.

SPECIFICATION forming part of Letters Patent No. 250,209, dated November 29, 1881.

Application filed April 29, 1880. (Model.)

To all whom it may concern:

Be it known that I, WELLSLY W. CRANE, of Auburn, in the county of Cayuga, and in the State of New York, have invented certain new and useful Improvements in Apparatus for Threading the Ends of Sheet-Metal Pipes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my machine from the front. Fig. 2 is a side elevation of the same. Figs. 3 and 4 are respectively elevations of the front and rear ends of said machine. Fig. 5 is a perspective view of a section of pipe having its ends threaded. Fig. 6 is a vertical section of my machine upon a line passing through its longitudinal center, and Fig. 7 is a like view upon line *x x* of Fig. 6.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable screw-threads to be pressed or rolled into the ends of sheet-metal pipes, so as to permit sections of such pipe to be connected together; to which end—

It consists, principally, in a machine for forming screw-threads upon sheet-metal pipes, in the combination of a rotating cylindrical die provided with a peripheral screw-thread, a second rotating cylindrical die having its periphery adapted to engage with one or more of the threads of said threaded die, and means whereby said dies are simultaneously and positively rotated, and one of the same at each revolution is positively moved in a line with its axis a distance corresponding to the pitch of said peripheral screw-thread, substantially as and for the purpose hereinafter specified.

It consists, further, in a machine for forming screw-threads upon sheet-metal pipes, in the combination of a positively-rotated cylindrical die provided with a peripheral screw-thread, a positively-rotated cylindrical die having its periphery adapted to engage with one or more of the threads of said threaded die, two shafts upon which said dies are separately mounted, and a screw-thread formed upon one of said shafts and working in a threaded bearing, whereby one of said dies is moved in a line with its axis, substantially as and for the purpose hereinafter shown.

It consists, further, in the combination of a positively-rotated cylindrical die provided with a peripheral screw-thread, a second die rotated positively in the same plane, and means whereby one of said dies may be adjusted toward or from the other, and means whereby it may be positively moved in a line with its axis, whereby said second die may be enabled to engage with and track one or more of the threads of said threaded die, substantially as and for the purpose hereinafter set forth.

It consists, further, in the combination of a rotating cylindrical die provided with a peripheral screw-thread, a second die adapted to engage with and arranged to rotate in the same plane, and means whereby said dies are positively rotated with velocities corresponding to their relative diameters, and are caused to have rolling peripheral contact, substantially as and for the purpose hereinafter shown and described.

It consists, further, in the means employed for adjusting the traveling die toward or from the main die and preserving the parallelism of their axes, substantially as and for the purpose hereinafter specified.

It consists, finally, in the combination of the several parts of the machine, substantially as and for the purpose shown.

In the annexed drawings, A represents the base, B and B the standards, and C the top or cross bar, of my machine, constructed preferably of or from cast metal, and adapted to be secured upon a bench or other like support.

Within the lower ends of the standards B is journaled a shaft, D, which, upon one of its projecting ends, has secured a cylindrical block of metal, E, that is provided with a peripheral screw-thread, *e*, that extends from end to end, and has a rounded top and bottom, as seen in Fig. 2, while upon the opposite projecting end of said shaft are secured two spur-gears, F and G. Above the bearing of the shaft D each standard B has a vertical slot, *b*, which contains a box, H or H′, that is capable of being moved vertically within said slot by means of a screw, I, which is secured to the upper side at the center of said box, and from thence extends upward through the cross-bar C and through a nut, K, that is journaled upon or within the latter. Said nuts have toothed peripheries, which mesh with the teeth of a gear-wheel, L, that is journaled between the same, and is provided with a handle, *l*, which permits it to be rotated, by which arrangement said nuts are caused to rotate simultaneously in the same

direction and with the same speed, so as to move said screws I and boxes H and H′ to equal distances vertically in an upward or a downward direction.

It will be obvious that while I preferably employ the arrangement described, the same result can be secured by causing the screws I to revolve, and causing the nuts K to remain stationary.

The box H, nearest to the threaded block or die E, is threaded interiorly, while the second box, H′, has a plain, cylindrical, and much smaller opening; and within said boxes is journaled a shaft, M, that has an exteriorly-threaded portion, *m*, which fits within said box H, and has one-half the pitch of the die-thread *e* and another plain but smaller portion, *m′*, that corresponds to and fits into said box H′, each of said sections having such length as to permit said shaft to be moved longitudinally a distance equal to the length of said die E.

Upon the end of the shaft M, over the die E, is secured a second die or roller, N, which has preferably one-half the diameter of said die E, and at its periphery has preferably a length equal to one thread, *e*, of the same. Upon the rear end of said shaft is a gear-wheel, O, which meshes with the gear-wheel F of the shaft D and has one-half the diameter of the same. Said gear-wheel O is connected with said shaft M by means of a longitudinal groove, m^2, in the surface of the latter, and a key or feather, *o*, within the central opening of said gear-wheel, so that while said shaft is free to move longitudinally it must revolve with said gear-wheel.

The gear-wheel O may be journaled in any desired manner, but is preferably secured upon a sleeve, P, which passes from within through the box H′, and has upon its inner end a flange, that bears against the corresponding end of said box and limits end motion, said sleeve thus forming a bearing for and rotating with the shaft M.

The gear-wheel G, attached to the rear end of the shaft D, has a considerable diameter, and engages with a pinion, Q, that is journaled upon a suitable support, R, and is provided with a crank-handle, *q*, by means of which said pinion may be rotated and motion imparted through the gears G, F, and O to the shafts D and M.

As thus constructed, the parts of the machine co-operate, so that if the crank is turned in a forward direction the dies will rotate in opposite directions, but with exactly the same peripheral velocity, while the upper smallest die will travel along the thread of the lower die, and its grooved periphery will coincide with and embrace said thread.

It will be seen that the upper die, N, has a positive rotary and longitudinal movement, which, while coinciding with the rotation of the lower die, E, and with the travel of its thread *e*, is independent of, and is in no way produced by, said die E. The term "positive," as applied to the movements of said die N, is used to distinguish the same from a similar die in which one or both of its movements are produced by peripheral contact with a lower threaded die.

In using the machine the dies are separated sufficiently to enable the end of a sheet-metal pipe, S, to be passed over the lower die, E, after which the upper die, N, which is at the rear limit of its motion, is moved downward until said pipe is firmly clasped between the latter and said die E, after which said dies are caused to revolve. The upper die, N, will now travel along the thread *e* of the lower die, E, and press the metal of the pipe S into the same until said die N reaches the outer limit of its motion, after which the motion of said parts may be reversed and said die N run backward to its starting-point, and then raised from contact with said pipe; or it may be removed from contact with the latter at the outer limit of its motion. Said pipe, after threading, may be removed from said lower die by turning it in a forward direction, so as to unscrew it therefrom.

In order that pipes having different diameters may be threaded, several sets of dies are necessary; and in order that the variation in the relative height of the upper shaft may be compensated for, different sets of gear for connecting together the shafts must be provided to correspond to the said additional dies. Pipes threaded by this machine should have the usual variations in the size and shape of their ends, so that one end of each may fit into the end of another section, and the opposite end may fit over the end of a third section.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In a machine for forming screw-threads upon sheet-metal pipes, the combination of a rotating cylindrical die provided with a peripheral screw-thread, a second rotating cylindrical die having its periphery adapted to engage with one or more of the threads of said threaded die, and means whereby said dies are simultaneously and positively rotated, and one of the same at each revolution is positively moved in a line with its axis a distance corresponding to the pitch of said peripheral screw-thread, substantially as and for the purpose specified.

2. In a machine for forming screw-threads upon sheet-metal pipes, the combination of a positively-rotated cylindrical die provided with a peripheral screw-thread, a positively-rotated cylindrical die having its periphery adapted to engage with one or more of the threads of said threaded die, two shafts upon which said dies are separately mounted, and a screw-thread formed upon one of said shafts and working in a threaded bearing, whereby one of said dies is moved in a line with its axis, substantially as and for the purpose shown.

3. The combination of a positively-rotated cylindrical die provided with a peripheral screw-thread, a second die rotated positively in the same plane, and means whereby one of said dies may be adjusted toward or from the other, and means whereby it may be positively

moved in a line with its axis, whereby said second die may be enabled to engage with and track one or more of the threads of said threaded die, substantially as and for the purpose set forth.

4. The combination of a rotating cylindrical die provided with a peripheral screw-thread, a second die adapted to engage therewith and arranged to rotate in the same plane, and means whereby said dies are positively rotated with velocities corresponding to their relative diameters, and are caused to have rolling peripheral contact, substantially as and for the purpose shown and described.

5. As a means for simultaneously moving the boxes H and H′ vertically, the screws I, connected with said boxes, the toothed nuts K, placed upon or around said screws, and the gear-wheel L, between and engaging with said nuts, substantially as and for the purpose set forth.

6. The combination, with the supporting-frame, of the shaft D, spirally-grooved die E, gear-wheels F and G, boxes H and H′, screws I, toothed nuts K, gear-wheel L, shaft M, having a threaded section, *m*, traveling die N, gear-wheel O, pinion Q, and crank *q*, substantially as and for the purpose shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of April, 1880.

WELLSLY W. CRANE.

Witnesses:
GEO. S. PRINDLE,
G. B. LONGSTREET.