

(No Model.)

2 Sheets—Sheet 1.

S. S. SERGEANT.

MACHINE FOR CORRUGATING PIPE OR TUBING.

No. 569,431.

Patented Oct. 13, 1896.

Fig. 1.

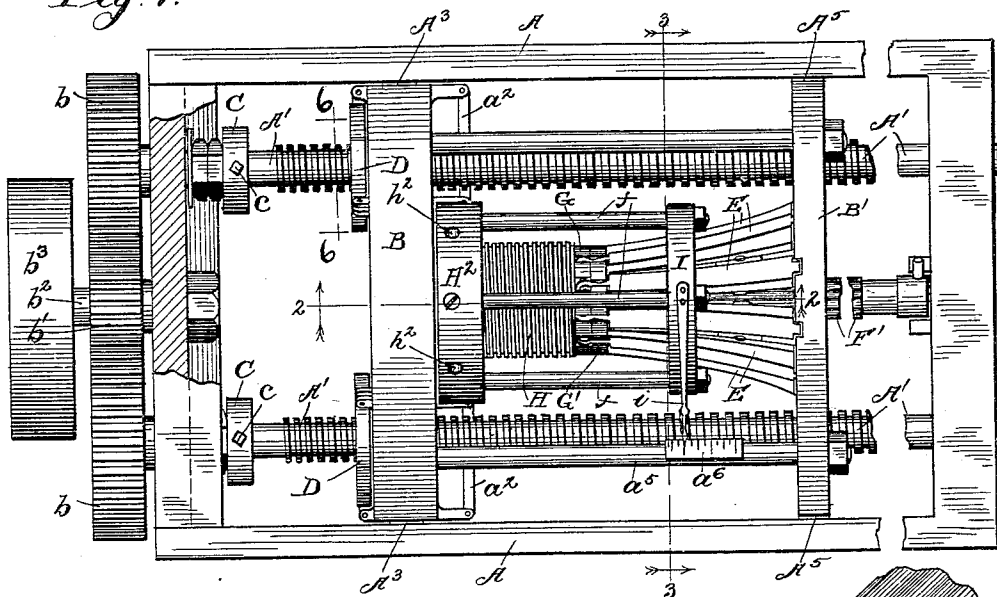


Fig. 8.

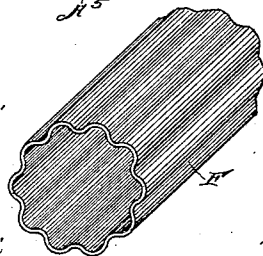
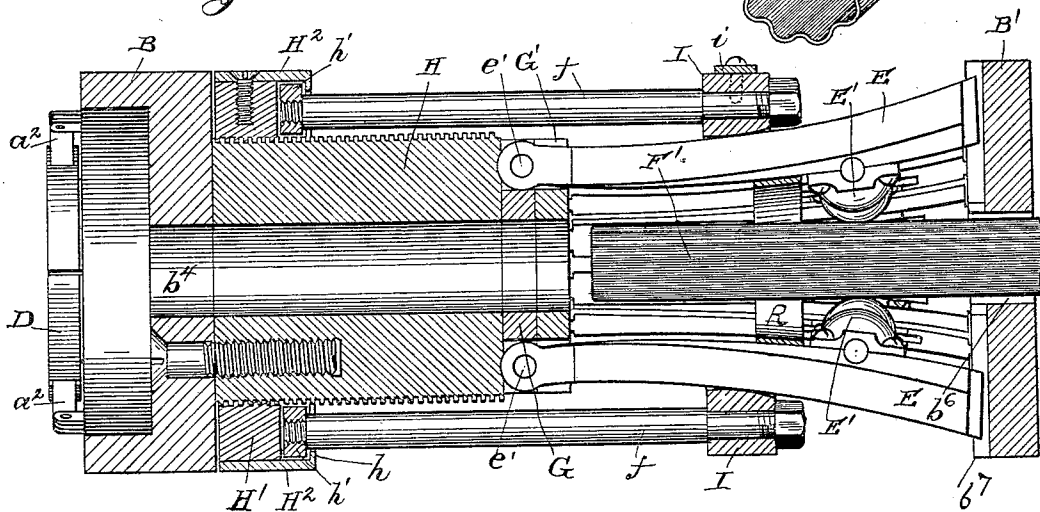


Fig. 2.



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MACHINE FOR CORRUGATING PIPE OR TUBING.

SPECIFICATION forming part of Letters Patent No. 569,431, dated October 13, 1896.

Application filed February 17, 1896. Serial No. 579,473. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. SERGEANT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Corrugating Pipe or Tubing, of which the following is a specification.

This invention relates to improvements in a tool or machine to be employed for forming corrugations in pipe or tubing after said pipe or tubing has been made; and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The objects of my invention are, first, to provide a machine for corrugating pipe or tubing which shall be simple and inexpensive in construction, strong and durable, and effective in operation; second, such a machine which shall form the corrugations with uniformity and in a rapid and easy manner; third, a corrugating-machine the parts of which may be so adjusted as to operate on and form any number of corrugations in pipes or tubes of various sizes.

Still another object of my invention is to so construct and arrange the parts that the traveler may be returned to its normal position or starting-point without reversing the motion of the machine.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a plan view of my machine, foreshortened for the convenience of illustration and showing it mounted on a frame or support and the parts in position ready for operation. Fig. 2 is a central longitudinal sectional view taken on line 2 2 of Fig. 1, showing a portion of the corrugating mechanism with a core in position therein. Fig. 3 is a cross-sectional view, partly in elevation, taken on line 3 3 of Fig. 1, showing a part of the corrugating mechanism and the guide-plate therefor, with the core in position. Fig. 4 is a face view of the securing-disks for the clamping-arms, showing a fragment of one of said disks. Fig. 5 is a cross-sectional view

of the traveler and one of its segmental releasing-nuts, taken on line 5 5 of Fig. 6 and showing a portion of one of the operating-screws in elevation. Fig. 6 is a view in elevation, partly in section, taken on line 6 6 of Fig. 1, showing a portion of the traveler and one of its segmental releasing-nuts. Fig. 7 is a detached perspective view of one of the clamping-arms provided with a corrugating wheel or roller; and Fig. 8 is a perspective view of a piece of pipe or tubing after being corrugated by means of my machine.

Similar letters refer to like parts throughout the different views of the drawings.

A represents the main or supporting frame, which may be of any suitable size, form, and material, but usually rectangular, as shown in the drawings. Upon this frame or support, and having their bearings in the ends thereof, are located the screw-shafts A' for operating the traveler B, which carries the corrugating mechanism, as will be presently explained. On one end of each of these screw-shafts is secured a cogged gear *b*, which meshes with a pinion *b'*, mounted on a shaft *b²*, journaled on the main frame, which shaft is provided with a pulley *b³*, to which the driving power may be applied by means of a belt or otherwise. Near the ends of each of the screw-shafts A', on which are mounted the gears *b*, is secured by means of a set-screw *c* a collar C, which is employed as a buffer or guide for the segmental releasing-nuts D of the traveler.

As shown in Fig. 1 of the drawings, the screw-shafts A' are parallel with each other and pass through the guide plate or piece B' for the clamping-arms E, which guide-piece extends across the main frame, as shown. The traveler B is formed with a central opening *b⁴*, through which the tube or piping F and core F' therefor may pass in the operation of the machine. Near each of its ends the traveler B is provided with tapering openings *b⁵* for the reception and operation of the sectional or segmental releasing-nuts D, which, as shown in Figs. 5 and 6 of the drawings, are preferably formed of three pieces *d*, *d'*, and *d²*, substantially triangular in cross-section and tapering toward their front portions to correspond to the taper of the opening *b⁵* in the traveler in which they operate.

The rear surface of the traveler is provided with a number of recesses a near the openings b^5 for the reception and retention of springs a' , which nest in said recesses and contact at their outer portions with the flanges d^3 of the releasing-nuts and serve to hold the segments thereof in the position indicated by dotted lines in Fig. 5 of the drawings, when it is desired to retract the traveler.

The segments of the releasing-nuts are secured to the traveler by means of arms a^2 , which are pivoted at one of their ends to the traveler and at their other ends to the segmental pieces, and for this purpose the segments are formed with recesses a^3 on their rear portions for the insertion of pivot-pins a^4 , as shown in Fig. 6 of the drawings. The screw-shafts A' pass through suitable openings A^2 in the cross or guide piece B' , which is secured to the traveler B by means of suitable rods a^5 , one of which rods is provided with a scale a^6 for regulating the depth of the corrugations. The side pieces of the main or supporting frame A are formed with longitudinal grooves A^4 on their adjacent surfaces for the reception and operation of the projections A^3 on the ends of the traveler, and like parts A^5 on the guide-piece B' , which is formed with a central opening b^6 for the passage of the tube F and core F' or mandrel.

In the surface of the piece B' , adjacent to the traveler, are formed a series of grooves b^7 , extending radially from the opening b^6 , which are for the reception and guidance of the free ends of the clamping-arms E , which arms, as is clearly shown in Figs. 2, 3, and 7, are bowed or somewhat curved on their outer surfaces and are beveled on their inner surfaces, as shown at e , in order to allow them to be forced closely together on the pipe or tubing. Each of these clamping-arms has journaled in suitable bearings on its inner surface a beveled wheel E' , to contact with and form corrugations in the pipe or tubing, and are formed or provided at their inner or secured ends with transverse projections e' , which fit in the recesses g and g' of the disk G , and act as pivot-points for said arms, whose central inner portions rest on a circular spring R , which may be secured near its ends to one or more of the clamping-arms, and serves to hold them normally a slight distance apart, as is apparent by reference to Fig. 3.

It will be observed by reference to Fig. 4 that the recesses g are provided with lateral offsets or enlargements g^2 , into which the ends of the projections e' will extend and be retained, while the recesses g' are without said offsets to admit of the removal of each alternate arm, so that a less number of corrugations may be formed, and also a smaller pipe or tubing may be operated upon by the wheel-carrying clamping-arms. The disk G' is provided around its periphery with a number of open slots g^3 to correspond with the number of slots in the disk G , but are somewhat smaller than the slots in the last-named

disk, and prevent the arms being displaced longitudinally, yet will allow every alternate arm to be removed when desired. The disks G and G' are hollow, as shown, for the passage of the tube and mandrel or core, and are secured to the free end of the head H , which is externally screw-threaded and is secured at its rear portion to the traveler B . Around the head H is placed a screw-threaded collar H' , to the periphery of which is secured a ring H^2 , having on its front portion an annular flange h , between which flange and the collar H' is located a loose collar h' , in which are secured the bolts f , on the other ends of which is fastened the collar I , which actuates the clamping-arms. The ring H^2 and collar H' are provided at proper points with openings h^3 for the insertion of a handspike or other instrument to turn the collar on the head H , when it is desired to advance the collar I on the clamping-arms in order to force the wheels thereof against the pipe or tubing. On the upper surface of the collar I is secured a finger i to indicate on the scale a^6 the depth of the corrugations, which are to be formed in the pipe.

The operation of my machine is simple and as follows: The traveler and guide piece or plate B' , forming a carriage for the corrugating mechanism, is retracted until the nuts D contact with the collars C on the screw-shafts, when the threads on said shafts will engage those on the segmental releasing-nuts in the traveler. A piece of pipe or tubing is then placed upon the corrugated core or mandrel, which may be secured to the opposite end of the supporting-frame or otherwise, and is then inserted between the radially-arranged wheels E' on the clamping-arms, which are forced into contact with the pipe or tubing by turning the collar H' on the head H , which will cause the ring or collar I to advance on the clamping-arms E , which, as before stated, are curved outwardly, and force the wheels E' against the pipe or tubing with such power as to produce the desired corrugations, the depth of which corrugations will be indicated by means of the finger i and the scale a^6 employed for said purpose. The power is then applied to the pulley b^3 or shaft b^2 , which will drive the traveler and guide-piece B' , carrying the corrugated mechanism forward on the main frame until corrugations of a sufficient length have been produced in the pipe or tubing, which will pass through the hollow openings in the disk G G' , head H , and traveler. When it is desired to retract or return the traveler and clamping mechanism to its starting-point, the traveler may be pushed forward to the position indicated by dotted lines in Fig. 5, which will cause the segments of the releasing-nuts to be disengaged from the screw-shafts A' , as is apparent, when the entire mechanism may be quickly and easily slid to the starting-point or rear portion of the supporting-frame. The collars C , being adjustably secured on the

screw-shafts by means of set-screws *c*, are designed to be so placed as to act as buffers or guides for the releasing-nuts *D*, so that their engagement with the screw-shafts will be positive and easily accomplished.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a main frame, of a carriage movably mounted thereon, a series of arms radially arranged on said carriage, a corrugating-wheel journaled on each of the arms, means to force and hold said wheels in contact with the pipe or tube, and a screw-shaft to propel the carriage, substantially as described.

2. The combination with a main frame, of screw-shafts journaled thereon, means to operate said shafts, a traveler and guide-plate forming a carriage mounted on the screw-shafts, a segmental releasing-nut pivotally secured in the traveler near each of its ends and adapted to engage the screw-shafts, a series of corrugating-wheels radially arranged on the carriage, and means to force and hold said wheels in contact with the pipe or tube, substantially as described.

3. The combination with the screw-shafts, of a traveler provided with a tapering opening near each of its ends, a tapering segmental releasing-nut pivotally secured to the traveler in said openings, and adapted to engage the screw-shafts and to be released therefrom, substantially as described.

4. The combination with the screw-shafts, of a mechanism to drive the same, a traveler provided with a tapering opening near each of its ends, and recesses in its rear surface near said openings, a tapering segmental releasing-nut pivotally secured to the traveler in said openings and adapted to engage the screw-shafts when advancing thereon, and to be released therefrom when desired, and springs located in the recesses in the traveler to hold the segments of the nut out of engagement with the shafts, substantially as described.

5. The combination of the screw-shafts, with a mechanism to drive the same, a traveler and guide plate or piece forming a carriage mounted on said shafts, a hollow screw-threaded head secured on the front of the traveler, a series of clamping-arms pivotally secured at one of their ends to the head, a corrugating-wheel on each arm, a clamping-collar around the arms, a screw-threaded col-

lar on the head connected with the clamping-collar, and having means to advance it on the head and the clamping-collar on the arms, substantially as described.

6. The combination of the screw-shafts, with a mechanism to drive the same, a traveler and guide-plate forming a carriage mounted on said shafts, a hollow screw-threaded head secured on the front of the traveler, a series of clamping-arms pivotally secured at one of their ends to the head, a corrugating-wheel on each arm, a clamping-collar around the arms, a screw-threaded collar on the head, a ring having an annular flange secured on the periphery of said collar, a loose ring encircling the head between the flange and screw-threaded collar and connected to the clamping-collar, and means to advance the clamping-collar on the arms, substantially as described.

7. The combination of the screw-shafts, with a mechanism to drive the same, a traveler and guide-plate forming a carriage mounted on said shafts, the guide-plate having a central opening and a series of radial grooves around said opening, a hollow screw-threaded head secured on the front of the traveler, a series of clamping-arms pivotally secured at one of their ends to the head, and having their other ends located in the grooves of the guide piece or plate, a corrugating-wheel on each arm, a clamping-collar around the arms, a screw-threaded collar on the head connected with the clamping-collar, and having means to advance it on the head, and the clamping-collar on the arms, substantially as described.

8. The combination with the disk *G*, having the recesses *g*, provided with the enlargements *g*², and the alternate recesses *g*¹, of the disk *G*¹, having the open slots *g*³, and secured on the disk *G*, the series of arms *E*, having the projections *e*¹, at one of their ends, the corrugating-wheels *E*¹, journaled on said arms, and a spring to hold the arms normally apart, substantially as described.

9. A traveler provided with a tapering opening, and recesses near said opening, a segmental tapering nut pivotally secured to the traveler in the opening, and springs in the recesses to hold the segments out of the tapering opening, substantially as described.

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