

UNITED STATES PATENT OFFICE.

EMIL H. FICKINGER, OF CANTON, OHIO, ASSIGNOR TO THE ACME ROOFING COMPANY, OF SAME PLACE.

MACHINE FOR MAKING CONDUCTOR-PIPES.

SPECIFICATION forming part of Letters Patent No. 531,170, dated December 18, 1894.

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To all whom it may concern:

Be it known that I, EMIL H. FICKINGER, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful
5 Improvements in Machines for Making Conductor-Pipes; 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 pertains
10 to make and use the same.

My invention relates to improvements in machines for making conductor-pipes, the machine being more especially designed for making corrugated conductor-pipes; and it
15 consists in certain features of construction, and in combinations of parts hereinafter described and pointed out in the claims.

In the accompanying drawings, Figures 1 and 2 are elevations of opposite ends of the machine, respectively, showing, in transverse
20 section, the track and guide along which the machine travels, stationary die or form, and the conductor-pipe P mounted upon said form or die. Fig. 3 is a side elevation of the machine. Fig. 4 is a section on line 4-4, Fig.
25 1. One of the corrugating-dies is shown removed in Figs. 1 and 4. Fig. 5 is a section on line 5-5, Fig. 2, and Fig. 6 is a section on line 6-6, Figs. 2 and 5. Fig. 7 is a transverse section of the conductor-pipe before the latter
30 is seamed and corrugated. Fig. 8 is a transverse section of the pipe after being corrugated, but before being completely seamed. Fig. 9 is a transverse section of the finished
35 pipe.

The machine comprises two heads, A and B, located a suitable interval apart and connected or tied together at the top and bottom by one or more cross-pieces, C, and the machine, at the bottom, is provided on each side
40 with a pair of grooved wheels, D, that engage the rails E of the track along which the machine is adapted to travel, and the machine, at the top, is provided with a pair of grooved
45 wheels G that are located preferably centrally between the two pairs of wheels D and engage a guide, H, that is arranged parallel with track E E and is supported from above in any suitable manner. Each of heads A and B
50 has a central hole or opening, *a* and *b*, respectively, said holes being of such size as to

accommodate the location of the stationary die or form I, upon which the pipe to be corrugated and seamed is mounted and also to accommodate the location and operation of
55 the adjustable dies K (hereinafter described) employed, to co-operate with form or die I, in corrugating the conductor-pipe.

The die or form I, upon which the pipe to be corrugated and seamed is mounted, consists, as heretofore, preferably of a metallic
60 beam that has such external contour as is desired to be given to the conductor-pipe, the same having longitudinal external corrugations, I', into which the metal of the pipe to be
65 corrugated is pressed by means of dies K. I provide, preferably, dies that are adjustable radially relative to the work, in order to take up the wear of the dies from time to time, and to accommodate different depths of cor-
70 rugations.

My improved corrugating-dies consist, respectively, of a wheel having a convex periphery and supported by and at the inner end of a radially arranged slide K' that is adjustable
75 endwise of a slide-way K² formed in and arranged radially of the supporting-head, the slide having, preferably, at its inner end, two inwardly-projecting lugs or ears K³ to and between which the rotary die is pivotally se-
80 cured.

One or both heads A and B of the machine are provided, respectively, with as many corrugating dies as it is desired to form corrugations in the conductor-pipe. The die-carrying
85 slides are secured, respectively, to the respective supporting-head, preferably by means of a bolt or screw, K⁴, the holes K⁵ in the slides through which the bolts or screws extend being elongated longitudinally of the
90 slides (or radially of the supporting-head) to accommodate the radial adjustment of the slides and the dies carried by the slides, and the dies are held in the desired adjustment, respectively, by means of a set-screw K⁶, that
95 extends through a correspondingly-threaded hole in a lateral lug or flange, K⁷, of the supporting-head, and engages the outer end of the respective die-carrying-slide, as shown very clearly in Fig. 4.

I prefer to employ two series of corrugating-dies, one series upon the outer side of the
100

one head A, and another series upon the inner side of the other head B as shown.

The pipe is mounted upon die or form I with the portion of the pipe to be seamed uppermost. The portions of the pipe that overlap each other, where the seam is to be formed, are preferably pressed more or less together before the seam is completely closed, and I, therefore, provide one or both heads of the machine with a radially adjustable roller, L, for operating upon said portions of the pipe, said roller being supported from a slide L' that is carried by and adjustable radially relative to the work in substantially the same manner as the slides that carry the corrugating-dies.

The seaming or seam-closing apparatus comprises a grooved wheel or roller M rotatably supported at the lower end of a swinging-frame or block, m , that is pivoted, at or near its upper end, as at m' , to and between laterally and outwardly-projecting and vertically-arranged flanges N' of a slide, N, that is adjustable endwise of a vertical slide-way n formed in a plate n' that is secured, preferably by means of bolts or screws n^2 , to the outer side of head B. Plate n' , at the top, is provided with two laterally and outwardly-projecting lugs or members n^3 that are located at opposite sides of slide N' , respectively, and are connected by means of cross-piece n^4 that affords bearing for a screw, O. The screw engages a correspondingly-threaded hole in member n^4 and is operatively connected with slide, N, the slide, at the top, having preferably a laterally and outwardly-projecting and horizontally arranged flange, N^2 , that is bored vertically for receiving the lower end of screw O, and the portion of the screw that extends into said flange being provided with an annular groove O' that is engaged by a set-screw O^2 extending into flange N^2 from the outer edge of said flange.

By the construction just described, it will be observed that the screw can be turned in the one direction or the other but cannot become displaced endwise from the slide; that the slide and the seaming-wheel or roller carried thereby are adjusted toward and from the work according as the screw is turned in the one direction or the other. The screw is adapted to be secured in the desired adjustment by means of a nut Q mounted thereon at the top side of member n^4 .

The machine, it will readily be understood, is moved in the one direction during the corrugating-operation and in the opposite direction during the seaming-operation.

Because the seaming-wheel or roller is capable of swinging outwardly, it follows that the same will operate idly during the corrugating operation of the machine, and to positively prevent the seaming-roller from closing the seam during the corrugating operation, the frame or block that carries said roller, is preferably weighted at its inner side, as at m^2 . The outer side of slide N however,

forms a stop to prevent the seaming-wheel or roller from being swung inwardly, as shown very clearly in Fig. 5, and said wheel or roller will, therefore, be properly held to its work during the seaming-operation. The axis of the seaming-wheel or roller is preferably located just inwardly or rearwardly of the pivotal bearing of the frame or block that carries said wheel or roller, as shown in Fig. 5, which feature is clearly indicated by dotted lines R R' drawn vertically and parallel with each other through the axis of the wheel or roller, and axis of the swinging-frame or block, respectively. By having the axis of the seaming-wheel or roller located a trifle rearwardly of the pivotal point of the frame or block that carries said wheel or roller, in conjunction with the stop formed by the outer side or slide N' , it is obvious that the seaming-wheel or roller will positively be held to its work during the seaming or seam-closing operation. The seaming-wheel or roller cannot be moved inwardly by reason of said stop and any tendency of the wheel or roller to swing outwardly during the seaming operation will, owing to the peculiar location of the axis of said wheel or roller, relative to the axis of the frame or block that carries the wheel or roller, result in a still larger pressure upon the portions of the pipe to be seamed.

It is sometimes desirable or found necessary to adjust plate n' that bears the slide-way of the seaming-roller-carrying-slide horizontally to bring the seaming-wheel or roller into accurate adjustment laterally of the machine relative to the location of the seam. To this end, I elongate holes n^5 , in said plate and through which the securing-bolts n^2 pass, in a horizontal direction, and hence, by loosening said bolts plate n' can be adjusted horizontally, and secured in the desired adjustment by retightening the bolts.

It is also important to provide a firm bearing or support for the conductor-pipe, and the die or form upon which the pipe is mounted, at a point diametrically or approximately diametrically opposite the location of the seaming-wheel or roller. The bearing or support referred to consists preferably of a wheel or roller, S, whose peripheral surface has such contour as to nicely fit the adjacent surface of the conductor-pipe. This wheel or roller is revolvably supported at the upper end of a slide, S' , that is adapted to be adjusted endwise, by means of a screw, S^2 , in a vertical slideway S^3 formed upon plate S^4 that is suitably secured to the outer side of head B of the machine. The construction whereby the adjustment of said slide S' is effected, is substantially the same as that already described in connection with the adjustable feature of the seaming-wheel or roller, and plate S^4 is also preferably adjustable horizontally in the same manner as plate n' . I would also remark that the corrugating-dies of each series of corrugating-dies are preferably removable

together, and, to this end, the portion of the supporting-head, that is provided with the slideways and carries the slides, consists of a plate 11 that is detachably secured, by means of bolts 12, to the remainder or body of the head, plate 11, on its inner face, having preferably an annular flange 13 that nicely fits into the centrally-located hole or opening of the body portion of the head.

By the construction just described, when it is desired to adapt the machine for larger or smaller work, it is merely necessary to remove the plates that carry the corrugating-dies and to introduce other plates bearing dies constructed and arranged for the size of work desired, without requiring the separation, removal or any interference with other parts of the machine. I would also remark that to prevent the seaming-roller, at the edges of its periphery, from cutting or mutilating the work operated upon, the periphery of said roller, on each side of the groove in the roller, is beveled or slopes inwardly toward the axis of the roller, as at M'.

What I claim is—

1. The combination with a two-railed supporting track, a rail or guide arranged centrally of, parallel with and a suitable distance above the supporting-track, and a longitudinally-corrugated stationary form or die for receiving the pipe to be corrugated and arranged parallel with and between the aforesaid track and guide, of a pair of heads A and B located a suitable interval apart and rigidly connected with each other, said heads or their connecting members being provided with wheels engaging the aforesaid supporting-track and guides, and a series of corrugating dies arranged to co-operate with the stationary form or die in corrugating the pipe, substantially as set forth.

2. In a machine of the variety indicated, a head or carriage provided with a slide and slideway, a seaming-roller-bearing-frame or block pivotally secured to the slide, said frame or block being free to swing in the one direction, a stop for preventing said frame from swinging in the opposite direction, suitable means for adjusting the slide and suitable means for securing the same in the desired adjustment, substantially as set forth.

3. In a machine of the variety indicated, a head or carriage provided with a slide-way, a slide adjustable endwise of said way, a frame or block pivotally secured to said slide, said frame or block bearing a seaming-roller and being free to swing in the one direction, a stop for preventing the frame from swinging in the opposite direction, suitable means for

adjusting the slide and holding the latter in the desired adjustment and the axis of the seaming-roller being located nearer to said stop than the axis of the roller-bearing-frame, substantially as and for the purpose set forth.

4. In a machine of the variety indicated, a head or carriage B, a plate n' secured to one side of said carriage and adjustable horizontally, said plate being provided with a vertical slideway, a slide adjustable endwise of said way, suitable means for adjusting and securing the slide in the desired adjustment, a seaming-roller-bearing-frame pivotally secured to the slide, said frame being free to swing in the one direction, and a stop for preventing said frame from swinging in the opposite direction, substantially as set forth.

5. In a machine of the variety indicated, a longitudinally-corrugated stationary die or form upon which the pipe to be corrugated and seamed is mounted, a track arranged parallel with said form or die and the machine having wheels engaging said track; corrugating dies arranged to engage and operate upon the external surface of the pipe and co-operate with the stationary form or die in corrugating the pipe, a seaming-roller adjustable radially relative to the work and a bearing for the work and stationary form or die at a point diametrically or approximately diametrically opposite the location of the seaming-roller, said bearing being also adjustable relative to the work to be operated upon and the stationary die or form having a surface adapted to co-operate with the seaming-roller, substantially as set forth.

6. In a machine of the variety indicated, a longitudinally stationary die or form upon which the pipe to be corrugated and seamed is mounted, a track arranged parallel with said form or die and the machine having wheels engaging said track, radially adjustable corrugating dies arranged to engage and operate upon the external surface of the pipe and co-operate with the stationary form or die in corrugating the pipe, and a roller adjustable radially relative to the work and adapted to press together the portion of the pipe to be seamed preparatory to the seam-closing operation, substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 21st day of November, 1893.

EMIL H. FICKINGER.

Witnesses:

JOSEPH A. PRICE,
C. H. DORER.