

I. W. NUMAN.  
SHEET METAL CORRUGATING MACHINE.  
APPLICATION FILED MAY 22, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

Fig. 2.

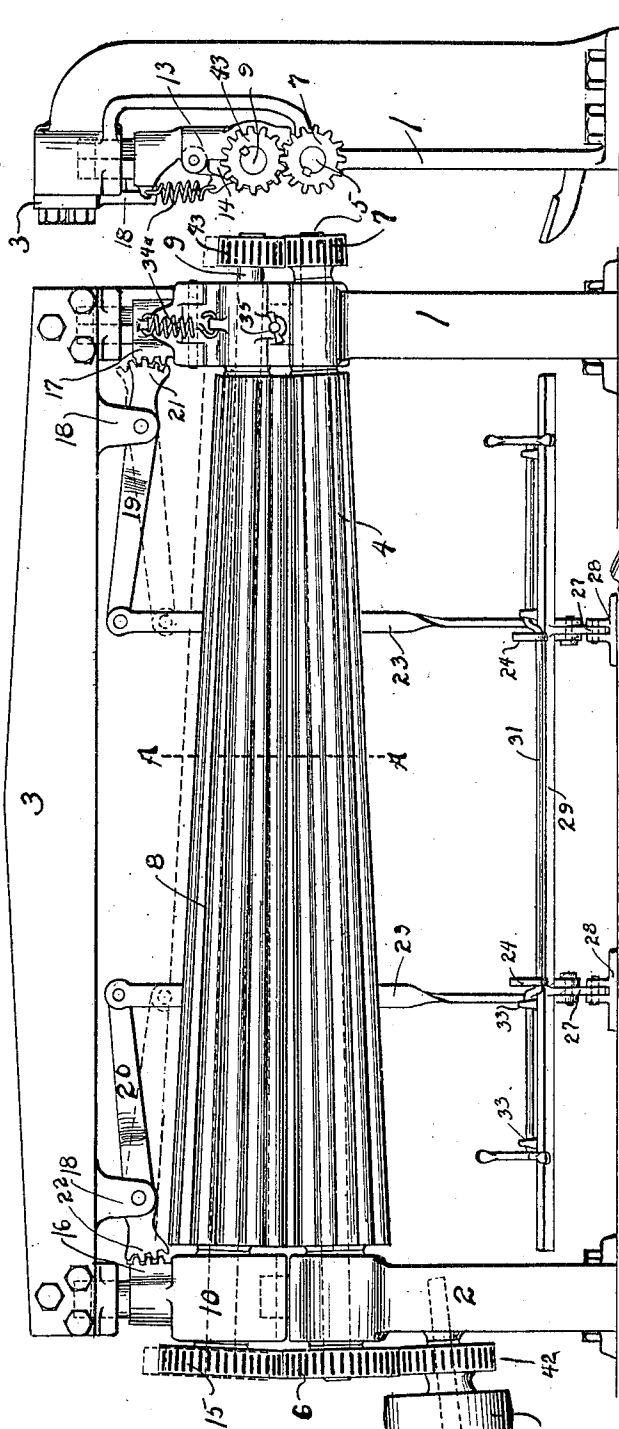


Fig. 3.

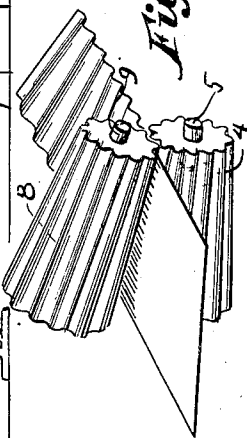


Fig. 4.

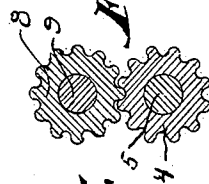
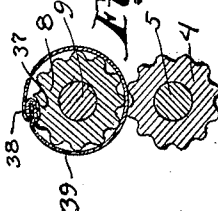


Fig. 5.



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No. 838,570.

PATENTED DEC. 18, 1906.

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SHEET METAL CORRUGATING MACHINE.

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2 SHEETS—SHEET 2.

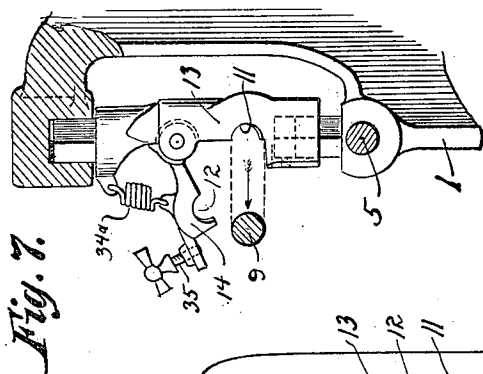


Fig. 7.

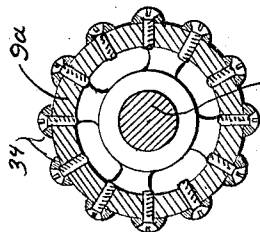


Fig. 8.

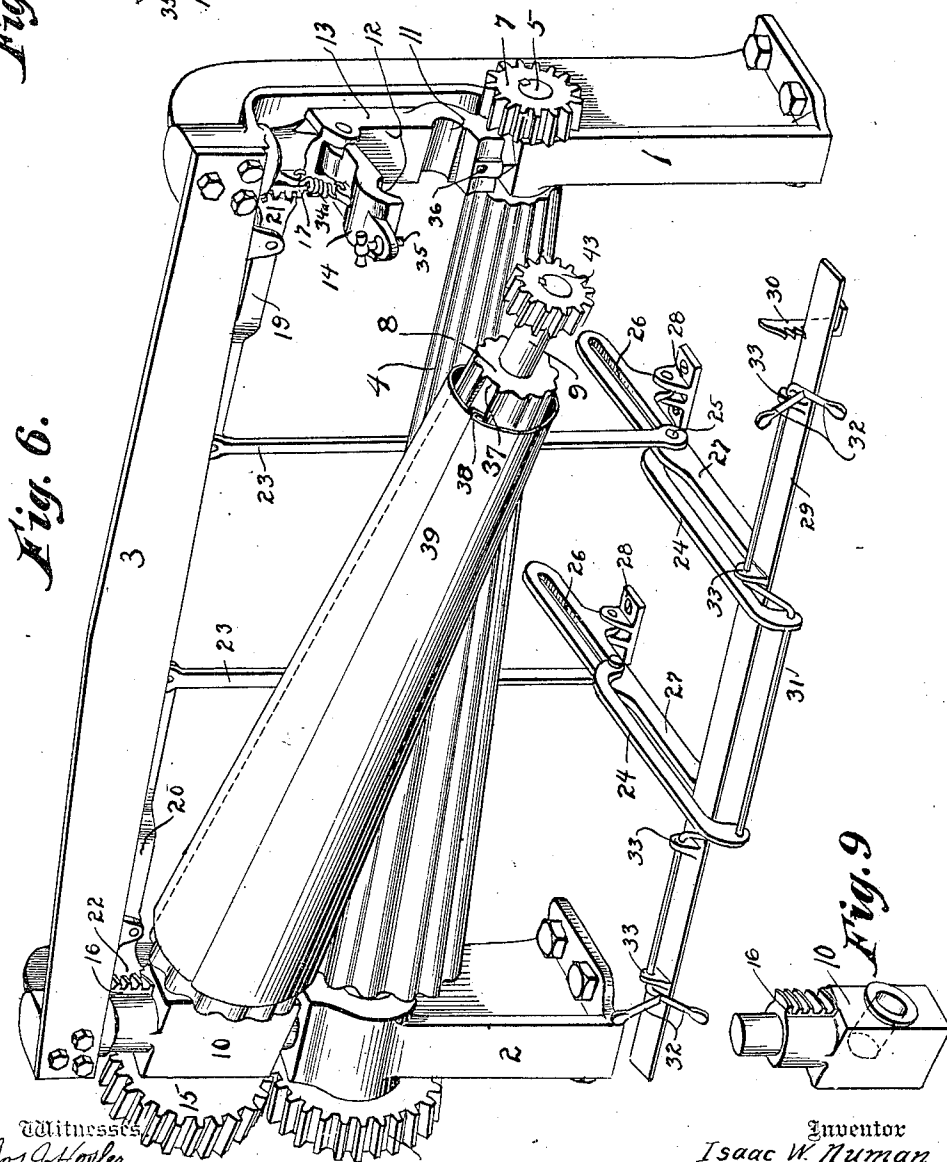


Fig. 6.

Fig. 9.

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# UNITED STATES PATENT OFFICE.

ISAAC W. NUMAN, OF CANTON, OHIO.

## SHEET-METAL-CORRUGATING MACHINE.

No. 838,570.

Specification of Letters Patent.

Patented Dec. 18, 1906.

Application filed May 22, 1906. Serial No. 318,197.

*To all whom it may concern:*

Be it known that I, ISAAC W. NUMAN, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Sheet-Metal-Corrugating Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the numerals of reference marked thereon, in which—

Figure 1 is a front elevation showing the corrugating-rolls in normal position. Fig. 2 is an end view showing the right-hand end of Fig. 1. Fig. 3 is a view showing portions of the rolls and a sheet of metal partially corrugated. Fig. 4 is a transverse section on line A A, Fig. 1. Fig. 5 is a transverse section of the rolls, showing the rolls spaced from each other or out of mesh and illustrating a plain column on the upper roll. Fig. 6 is a perspective view showing the upper roll swung out and in position to receive a plain column or tube and illustrating a column or tube located thereon. Fig. 7 is a view showing a portion of the frame bearing or standard and illustrating the bearing-head, showing the upper bearing open. Fig. 8 is an enlarged transverse section showing a modified form of the rolls from the ones shown in Figs. 4 and 5. Fig. 9 is a detached view of the rotary bearing-head for the upper roll.

The present invention has relation to machines designed to corrugate, flute, or place ornamental designs upon tapered columns; and it consists in the novel arrangement hereinafter described, and particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, 1 and 2 represent the upright end members, which are spaced apart equal to the length of the corrugating-rolls, or substantially so, and of course are held in proper parallel position at their bottom or lower ends in any convenient and well-known manner, and their top or upper ends tied together by means of the tie bar or beam 3. The lower corrugating-roll 4 is properly journaled in the upright members 1 and 2, which roll is provided with the shaft or bearings 5, and the outer ends of the shaft or bearing provided with the gear-wheels 6 and 7. Directly above the lower corrugat-

ing-roll 4 is located the upper corrugating-roll 8, which upper corrugating-roll is provided with the shaft or bearing 9, one end of said shaft being journaled in the rotary and movable head 10 and the opposite end of said shaft adapted to be located in a suitable bearing, which bearing is formed by means of the semicircular recesses 11 and 12, the recess 11 being formed in the movable head 13 and the recess 12 formed in the hinged cap 14, said grooves being so located with reference to each other and the hinged cap so attached that when said cap is closed or connected at its bottom or lower end to the head 13 a proper bearing will be provided for the shaft 9 at the end of said shaft where said bearing is located. The corrugating-rolls 4 and 8 are each tapered and are provided with tapered corrugations upon their peripheries, the size and shape of the corrugations corresponding in size and shape with the corrugations to be formed in the column.

It is well understood that in order to produce a tapered column and to corrugate the same it is necessary to provide means by which the corrugations can be made without buckling the metal and at the same time produce corrugations that will be properly tapered, so as to give a pleasing effect to the eye, and at the same time produce a perfect and properly-finished corrugated column. In order to provide for the difficulty just above described, I provide two tapered rolls, the taper of the rolls to correspond, substantially, with the taper designed and calculated to be given to the finished column. In use I prefer to construct a plain tapered cylinder or skelp, such as illustrated in Fig. 6, and in order to place the same upon one of the corrugating-rolls it is necessary to swing the corrugating-roll so as to permit the skelp to be slipped over and upon the roll. In order that this may be accomplished, I provide the head 13 with the hinged bearing-cap 14, thereby providing a means for opening the bearing proper and allow the roll to be swung. It will be understood that when the gear-wheel 6 and the gear-wheel 15 are held in mesh with each other it would be impossible to swing one of the rolls so as to bring it out of horizontal parallelism with the remaining roll, and in order to provide for both the swinging of the roll and throwing the gear-wheels 6 and 15 together with the corrugations of the rolls themselves, the movable and rotary head 10 is provided. The heads

10 and 13 are so attached to the upright members 1 and 2 that they are capable of longitudinal movement, and for the purpose of imparting longitudinal movement to said heads they are each provided with the toothed flanges 16 and 17, which toothed flanges are preferably formed integral with the upper portions of the heads 10 and 13; but of course they may be made separate and attached in any convenient and well-known manner. To the flanges 18, formed upon the tie bar or beam 3, are pivotally attached the levers 19 and 20, which levers are provided with the toothed segmental ends 21 and 22, which toothed segmental ends mesh with the toothed flanges 16 and 17, as illustrated in Figs. 1 and 6. To the inner ends of the levers 19 and 20 are pivotally attached the top or upper ends of the rods 23, which rods are attached at their bottom or lower ends to the links or throw-bars 24, which throw-bars and links are connected together by means of the cross-bolts 25, which cross-bolts pass through the slots 26, formed in the rocking levers 27, which rocking levers are pivotally attached intermediate their ends to the fixed flanged plates 28 or their equivalents. When it is desired to give an upward movement to the heads 10 and 13, the rocking levers 27 are moved downward at their outer ends, thereby moving the rods 23 downward with the downward movement of said rocking levers, which in turn moves the inner ends of the levers downward and the toothed segmental ends upward, thereby moving the heads 10 and 13 upward, which movement throws the gear-wheels 6 and 15 out of gear and also the corrugating ribs of the rolls 4 and 8 out of mesh, at which time the hinged bearing 14 can be released and the roll 8 swung into the position illustrated in Fig. 6.

For the purpose of holding the rocking levers 27 down they are tied together by means of the tread-bar 29, and the tread-bar held down together by means of the toothed bar 30, which toothed bar is held in fixed position upon the floor or other object. For the purpose of providing means for releasing the tread-bar 29, so that it can move upward, the toothed bar should be formed of spring material, so that it can be forced backward or away from the tread-bar 29, so as to disengage it from said tread-bar. When it is desired to move the heads 10 and 13 downward, the throw-bars 24 are moved so as to bring their ends to which the rods 23 are attached upon the opposite sides of the pivotal points of the rocking levers 27, this being accomplished by means of the crank-rod 31, which crank-rod is provided with the foot-levers 32, which foot-levers are formed integral or attached to the crank-rod 31, said crank-rod being journaled in suitable flanges 33, which flanges are located upon the tread-bar 29. It will be understood that the cross-

bolts 25 move in the slots 26 during the time the throw-bars 24 are moved in either direction. It will be understood that after the rods 23 have been shifted, so as to bring their lower or pivoted ends upon the opposite sides of the pivotal points of the rocking levers 27 from their position shown in Fig. 6, that a downward movement of the tread-bar 29 will move the inner ends of the levers 19 and 20 upward and their toothed segmental ends downward, thereby moving the heads 10 and 13, together with the different parts carried thereby, and the rolls 4 and 8 into proper contact with each other to corrugate a column and at the same time bring the gear-wheels 6 and 15 into proper mesh. It will be understood that it is necessary to impart a rotary or axillary movement to the head 10 in order to swing the roll 8, and in order to hold the toothed flange 16 and the toothed segmental ends of the lever 20 in mesh the teeth of the toothed flange 16 are formed of sufficient width to allow a partial rotary movement of the head 10 and at the same time maintain the mesh as between said toothed flange and its engaging toothed segmental head.

For the purpose of maintaining a uniform mesh regardless of the position of the toothed flange 16 the outer ends of the teeth are convex, as best illustrated in Fig. 9.

In Fig. 8 I have illustrated a modified form of a corrugating-roll, which consists in removably attaching the corrugating ribs 34 to the peripheries of the roll.

For the purpose of holding the bearing-cap 14 up and out of the way during the time the roll 8 is swung out of alinement with the roll said bearing-cap is provided with the spring 34<sup>a</sup>. For the purpose of holding the cap 14 down and in a closed position so as to provide a suitable bearing for the free end of the upper roll the screw-threaded bolt 35 is provided, which screw-threaded bolt is adapted to enter the screw-threaded aperture 36, formed in the head 13.

For the purpose of insuring the skelp to rotate with the rotation of the corrugating-roll upon which it is mounted said corrugating-roll is provided with the groove 37, which groove is for the purpose of receiving the locked seam 38 of the skelp 39.

For the purpose of imparting rotary movement to the rolls the power-shaft 40 is provided, which power-shaft may be located as shown and is provided with the power-wheel 41 and the gear-wheel 42.

For the purpose of preventing any lagging or twisting as between the corrugating-rolls at their opposite ends to that which power is directly applied the gear-wheels 7 and 43 are provided, by which arrangement the shafts upon which the corrugating-rolls are mounted will be rotated in unison.

In Fig. 8 the shaft 8<sup>a</sup> is provided instead of

the roll proper and the cylinder 9<sup>a</sup> mounted thereon. This is simply a modification as to the construction of the roll.

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

1. In a machine of the class described, tapered corrugated rolls, one of said rolls located in vertical adjustable bearings and the other in fixed bearings, the roll located in adjustable bearings adapted to swing in a horizontal plane and means for imparting rotary motion to the rolls, and one of the rolls provided with a seam-holding groove, substantially as and for the purpose specified.

2. In a machine of the class described, rolls provided with corrugating peripheries, one of the rolls adapted to swing in a horizontal plane and one end of said swinging rolls journaled in a rotatable movable head, said rotatable movable head adapted to move vertically to and from the non-swinging roll, a divided bearing for the free end of the swinging roll, and means for moving the bearings to and from the non-swinging roll and one of the corrugating-rolls provided with a seam-holding groove, substantially as and for the purpose specified.

3. In a machine of the class described, tapered rolls provided with corrugating peripheries, one of the rolls adapted to swing in a horizontal plane and one end of said swinging roll journaled in a rotatable movable head, said rotatable movable head adapted to move vertically to and from the non-swinging roll, a divided bearing for the free end of the swinging roll, and means for moving the bearings to and from the non-swinging roll, substantially as and for the purpose specified.

4. In a machine of the class described, corrugating-rolls tapered throughout their length and adapted to mesh with each other, one of

said rolls journaled in movable bearings, one of said movable bearings journaled in a line at right angles to the length of the roll carried by said journaled bearing, means for moving the bearings to and from the bearings of the opposite roll and gear-wheels adapted to impart rotary movement to the corrugating-rolls, substantially as and for the purpose specified.

5. In a machine of the class described, tapered corrugating-rolls, one located in adjustable bearings, said bearings formed in movable heads, said movable heads provided with toothed flanges, levers provided with toothed segmental ends, said toothed segmental ends adapted to mesh with the toothed flanges, rods pivotally attached at their upper ends to the levers and their lower ends provided with throw-bars, rocking levers provided with elongated slots, a tread-bar connected to the rocking levers, said tread-bar provided with a crank-rod and a crank-rod connected to the throw-bars and operating-levers connected to the crank-rod, substantially as and for the purpose specified.

6. In a machine of the class described, the combination of two tapered corrugating-rolls, one adapted to move from the other and the movable corrugating-roll adapted to swing in a horizontal plane when elevated and one of said corrugating-rolls provided with a seam-holding groove, and means for imparting rotary motion to both rolls when in contact with each other, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ISAAC W. NUMAN.

Witnesses:

J. A. JEFFERS,  
F. W. BOND.