

H. C. DRUMM.
COLUMN FORMING MACHINE.
APPLICATION FILED JAN. 26, 1914

1,158,794.

Patented Nov. 2, 1915.

3 SHEETS—SHEET 1.

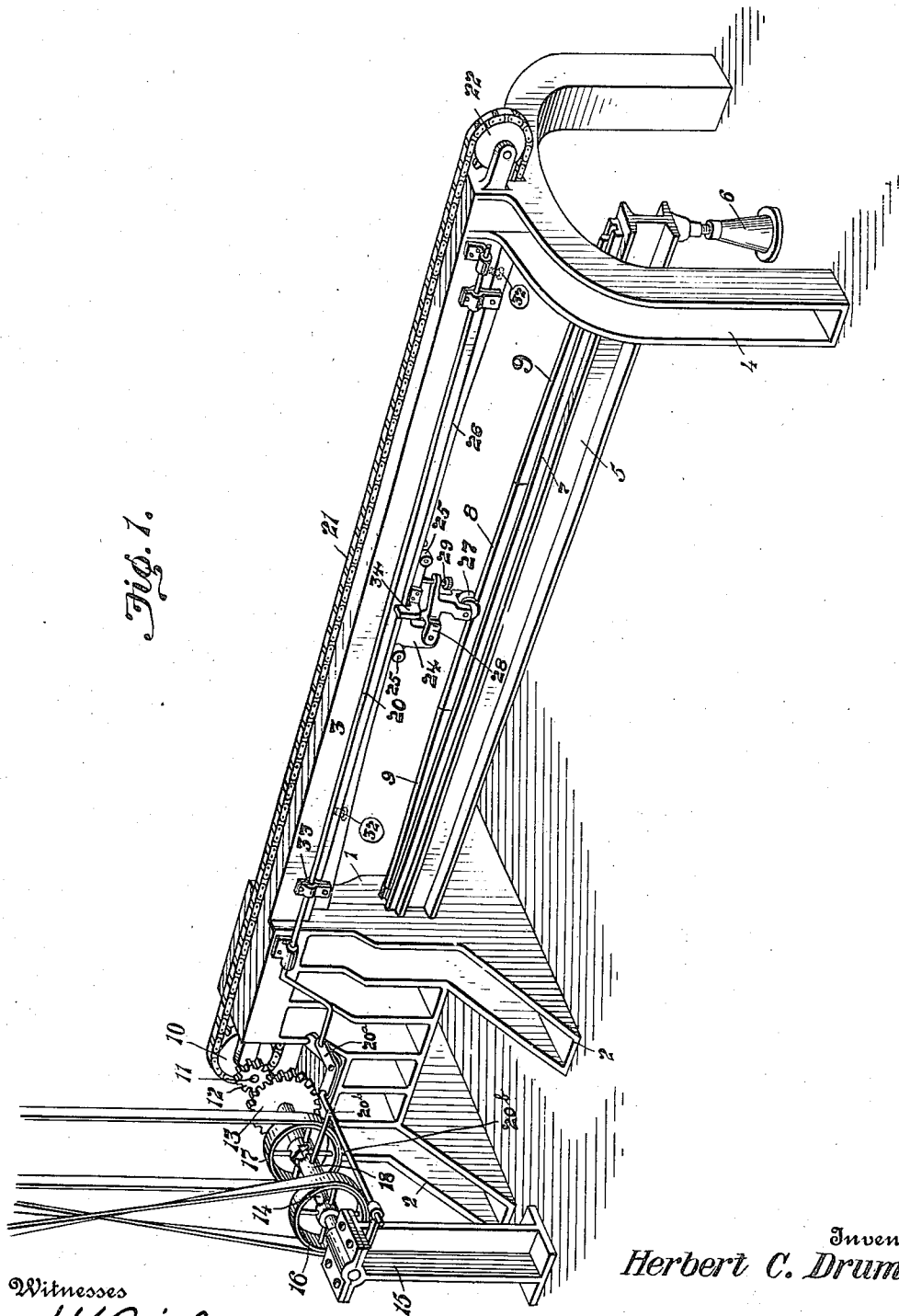


Fig. 1.

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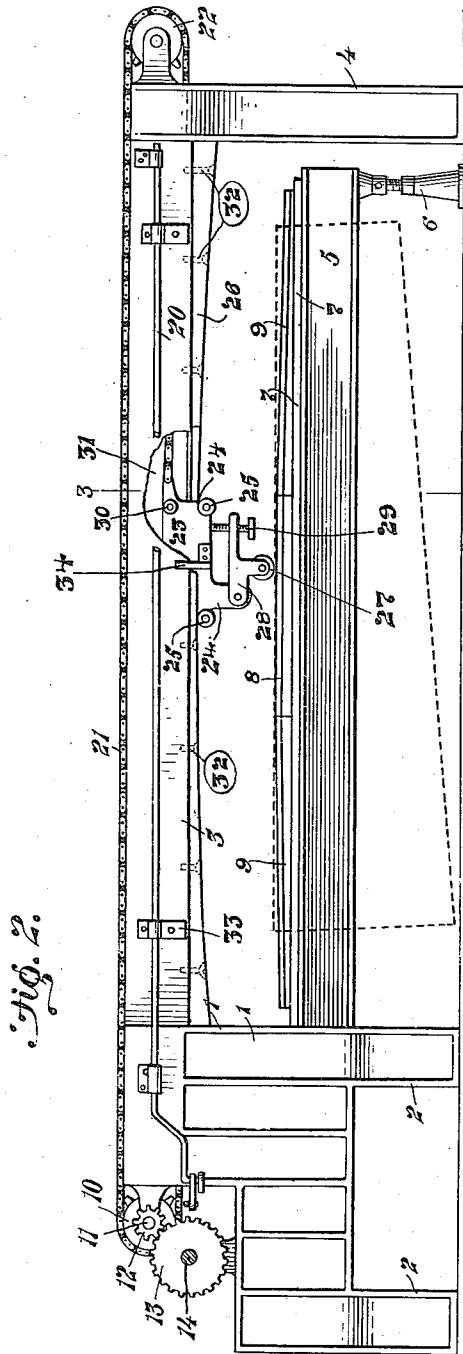


Fig. 2.

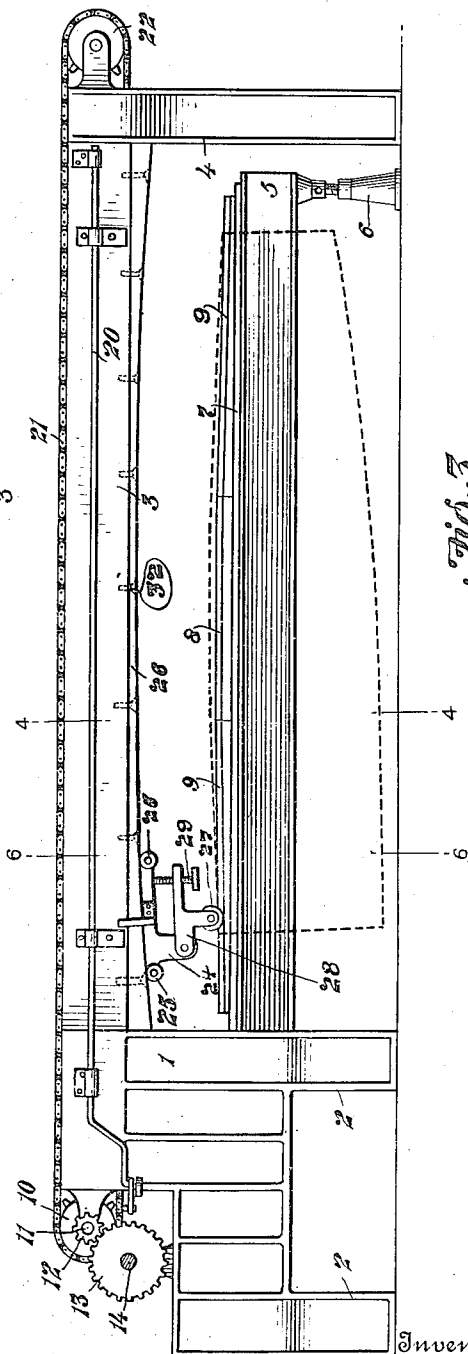


Fig. 3.

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3 SHEETS--SHEET 3.

Fig. 4.

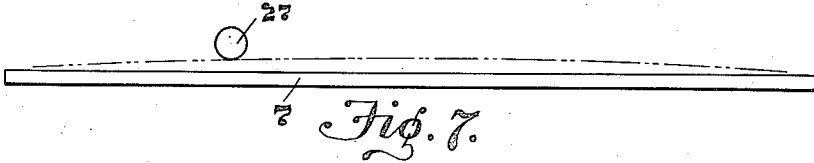
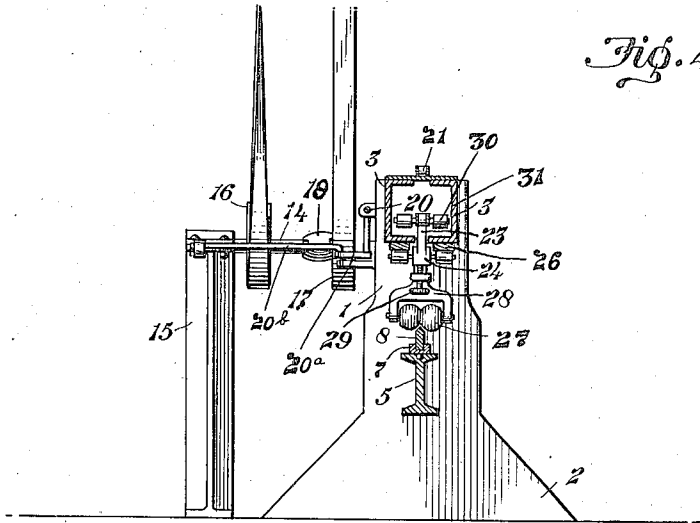


Fig. 7.

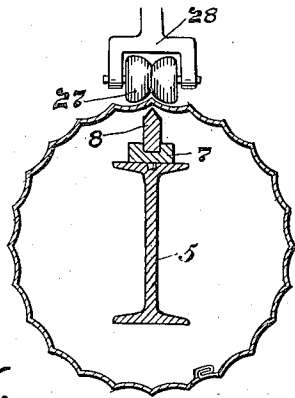


Fig. 5.

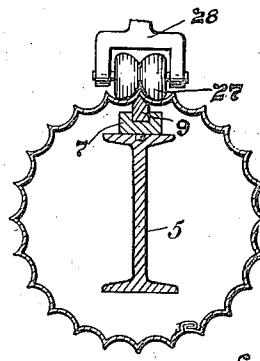


Fig. 6.

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UNITED STATES PATENT OFFICE.

HERBERT C. DRUMM, OF CANTON, OHIO, ASSIGNOR TO THE UNION METAL MANUFACTURING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

COLUMN-FORMING MACHINE.

1,158,794.

Specification of Letters Patent.

Patented Nov. 2, 1915.

Application filed January 26, 1914. Serial No. 814,331.

To all whom it may concern:

Be it known that I, HERBERT C. DRUMM, 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 Column-Forming Machines, of which the following is a specification.

My present invention relates to improvements in column forming machines, in which a traveling, shaping and forming roll is employed and operated in conjunction with suitable shaping and forming devices.

The objects of the present invention are, first, to provide a machine by which a column or shaft when produced being of the entasis type, and second, to so arrange the parts with reference to each other to so form the flutes, ridges or corrugations whereby the proper longitudinal curvature of the column as well as the longitudinal curvature of the flutes, ridges or corrugations will be formed and to give to the finished column the proper and desired entasis curvature. These objects, together with other objects readily apparent to those skilled in the art are attained by the construction illustrated in the accompanying drawings, although my invention may be embodied in a variety of other mechanical forms, the construction illustrated being chosen by way of example.

In the accompanying drawings—Figure 1 is a perspective view showing the different parts properly arranged with reference to each other. Fig. 2 is a side elevation showing the column or shaft in dotted lines, also showing the position of the machine before any action is taken upon the columns or shaft. Fig. 3 is a side elevation showing the working parts of the machine in different position from the position shown in Fig. 1, and the form of the column or shaft after being acted upon. Fig. 4 is a transverse vertical section on line 3—3, Fig. 2 with the exception of the collar or shaft 1 is not shown. Fig. 5 is a transverse vertical section on line 4—4, Fig. 3. Fig. 6 is a transverse section on line 6—6, Fig. 3. Fig. 7 is a diagrammatic view of the die-bar showing in dotted lines the movement of the forming rolls whereby the entasis curvature or formation is given.

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

In the accompanying drawings, 1 represents the main head, which is supported by suitable standards 2 which rest upon any suitable foundation. To the top or upper end of the head 1 are securely attached in any convenient and well known manner the tie-bars 3, which tie-bars are formed of a length somewhat greater than the length of the shaft or column designed to be operated upon, which operation is hereinafter described. The opposite ends of the tie-bars 3 are connected to the standard 4 in any convenient and well known manner, said tie-bars serving the purpose of connecting the head 1 together with its standards 2 and the standard 4, said parts being so attached and connected that a rigid structure or frame is provided.

To the head 1 is securely attached in any convenient and well known manner, one end of the supporting beam or bar 5; the opposite end being supported by means of some suitable detachable device such as a jack 6, but it will be understood that any suitable device adapted to support the beam 5 may be employed.

The object and purpose of providing a removable device for supporting the end of the bar 5 is to provide for removing the support, and bring it out of the way when it is desired to place or remove a column or shaft before being acted upon and to remove the same after the column or shaft has been acted upon as hereinafter described, the operation being of such a nature that an ordinary straight column or shaft is formed into what is known as an entasis column or shaft, or in other words the machine is designed to produce an entasis column.

Upon the bar 5 is located the channel bar 7, which channel bar is for the purpose of receiving and holding in proper position the die bars 8 and 9. In the drawings three die bars 8 and 9 are illustrated, but the number of sections going to make up a complete die bar is immaterial and in fact a single die bar formed of sufficient length and of the desired curvature may be employed. The only advantage in forming the die bar proper in sections is, first, the convenience and ease in

changing the die bar proper, and second, to change the curvature of any particular section with reference to the remaining section or sections whereby different longitudinal curvatures of the shaft or column can be produced.

It is well understood that to give the proper architectural effect the longitudinal curvature of a given column or shaft must necessarily vary, reference being had to its diameter and length, and hence it follows that in order to provide a single machine whereby the various curvatures may be produced, it necessarily follows that the die-bars must be changed from time to time.

At one end of the machine proper is located the sprocket wheel 10, which sprocket wheel is securely mounted upon the shaft 11 or its equivalent and upon which shaft is mounted the pinion 12, said pinion being driven by the gear wheel 13 mounted upon the shaft 14, one end of said shaft being properly journaled in the standard 15 or its equivalent. Upon the shaft 14 are properly located the open and closed belt pulleys 16 and 17, which belt pulleys are alternately, rotatably coupled and uncoupled by a suitable clutch 18, which is operated by the clutch shifting rod 20 and intermediate parts such as the bell crank or lever 20^a and the shift bar 20^b. The particular parts just above mentioned are common in machines where a reciprocating action is required as in planers and like machines, and the devices do not within themselves form any specific part of the present invention, but some mechanical device for shifting the reciprocating parts must necessarily be employed, and the parts are here shown in a conventional manner.

Around the sprocket wheel 10 is located the conveyer chain 21, which conveyer chain is extended around the sprocket wheel 22, which sprocket wheel is simply for the purpose of supporting the conveyer chain 21 and maintaining said chain in proper relationship as the chain is moved in opposite directions by the sprocket wheel 10. To the conveyer chain 21 is attached the upward extending plate or head 23, said head or plate extending up between the tie bars or channel bars 3.

Below the channel bars or tie bars 3 is located the downward extending carriage or head 24, which carriage is provided with the anti-friction rollers 25, which anti-friction rollers are so located that they will come in contact with the bottom or under edges of the track portions 26 of the channel or tie-bars 3. The track portions 26 may be curved, but when curved the curvature should be of a different degree from the curvature of the die-bars 8 and 9. The different degrees of curvature as between the tracks 26 and the die bars 8 and 9 being for

the purpose of increasing or decreasing the pressure of the roll 27, which roll is journaled in and carried by the pivoted arm 28, said arm being pivoted to the carriage 24.

It will be understood that when heavy pressure is brought upon a given flute, rib or corrugation of the column, such rib, flute or corrugation will be pressed or formed of greater depth or height, by which action the longitudinal curvature of the shaft or column will be varied, thereby producing a column of the entasis type and which differentiates said column or shaft from an ordinary, straight corrugated pipe or a tapered ended pipe in which there is no curvature, either in the straight portion of the pipe or in the tapered portion.

In order to limit the upward movement of the roll 27 and at the same time to provide adjustment for said upper movement the pivoted arm 28 is provided with the screw threaded bar 29, which screw threaded bar strikes against the bottom or under side of the plate or head 23, thereby limiting the upward movement of the roller 27, by which arrangement the pressure of the roll may be increased or decreased, reference being had to the adjustment of the screw 29.

It will be understood that as the carriage proper together with its different parts is moved under the tracks or ways 26, said carriage will move in a vertical direction, the same being forced downward by the tracks or ways 26 and moved upward by the die bars or more specifically the column or shaft, and in order to provide for this vertical movement of the carriage which is comparatively slight, the plate or head 23 is extended upward and provided with the anti-friction rollers 30 and when the carriage or head proper is moved upward, said anti-friction rollers are carried with it, which will elevate the anti-friction rollers, but when the head or carriage proper is lowered or suspended, said anti-friction rollers will travel back and forth upon the inward extended flanges 31. The arrangement being such that regardless of the differentiated curvature as between the die bars 8 and 9 and the curvature of the tracks or ways, the roll 27 will move together with the head in a vertical direction, either up or down. This arrangement being clearly illustrated in the diagrammatical view of Fig. 7. The dotted line showing the path of travel of the forming roll 27. In use it may be desirable to first form the column or pipe straight and with shallow flutes, ridges or corrugations upon a separate machine, and after so formed such column or shaft can be operated upon by the machine to which the present invention pertains.

In Fig. 5 a shaft or column is shown in cross section which may be formed upon a suitable mandrel such as commonly used,

and afterward formed into an entasis column or shaft, the finished column or shaft being shown in cross section in Fig. 6.

The track bars 26 are preferably formed separate from the tie-bars 3 and when formed separate they are attached to said tie-bars by suitable screws 32, said screws being so adjusted that their heads or ends will not extend below the surface of the tracks 26 so as to interfere with the rollers 25 and at the same time will not interfere with the movement of the anti-friction rollers 30.

In order to automatically shift the direction of the roll carriage the shifting rod 20 is provided with the strike blocks 33, which strike blocks are arranged to be actuated by the strike flange 34 upon the roll carriage proper, but the mechanism designed to automatically shift the direction of travel of the carriage does not have any specific reference to the present invention, but I have illustrated the most simple and usual construction.

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, a frame, a shaft supporting bar carried by said frame, a channel bar carried by said supporting bar, die-bars located in the channel bar, said die-bars curved intermediate their ends, the curvature adapted to longitudinally curve the shaft or column and to longitudinally curve the flutes and a pressure roll.

2. In a machine for forming entasis shafts, the combination of a frame, means for sup-

porting the shafts, a die-bar held in fixed relative position upon the shaft supporting means, the forming edge of said die bar curved and means for forming and curving flutes in the body of the column or shaft.

3. In a machine for forming entasis shafts, the combination of a suitable frame, a shaft supporting bar, a die-bar carried by said shaft supporting bar, means for holding said die-bar in fixed relative position with reference to the supporting bar, a pressure roll and means for moving said roll in a curved path.

4. In a machine of the class described, the combination of a suitable frame, a column supporting bar, a die-bar and track bar, said die-bar and track bar having differentiated curved edges, a carriage provided with a pressure roll and means for moving said carriage and pressure roll between the die bar and track bars.

5. In a machine for forming entasis shafts, the combination of a suitable frame, a shaft supporting bar, a die-bar carried by said shaft supporting bar, means for holding said die-bar in fixed relative position with reference to the supporting bar, a pressure roll and means for moving said roll to and from the die-bar.

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

HERBERT C. DRUMM.

Witnesses:

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