

(No Model.)

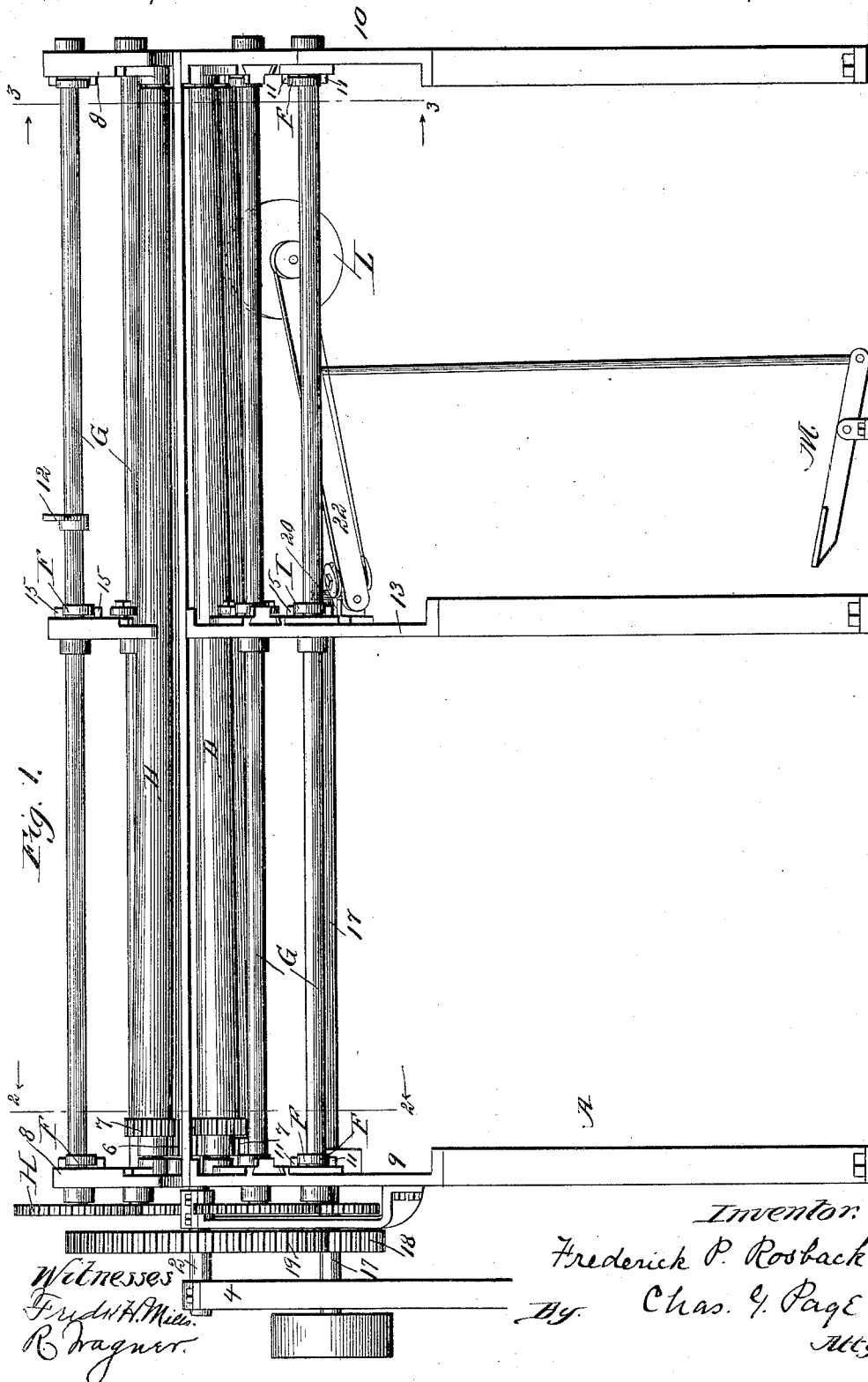
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F. P. ROSBACK.

MACHINE FOR MAKING TUBULAR SHEET METAL POSTS.

No. 463,201.

Patented Nov. 17, 1891.



(No Model.)

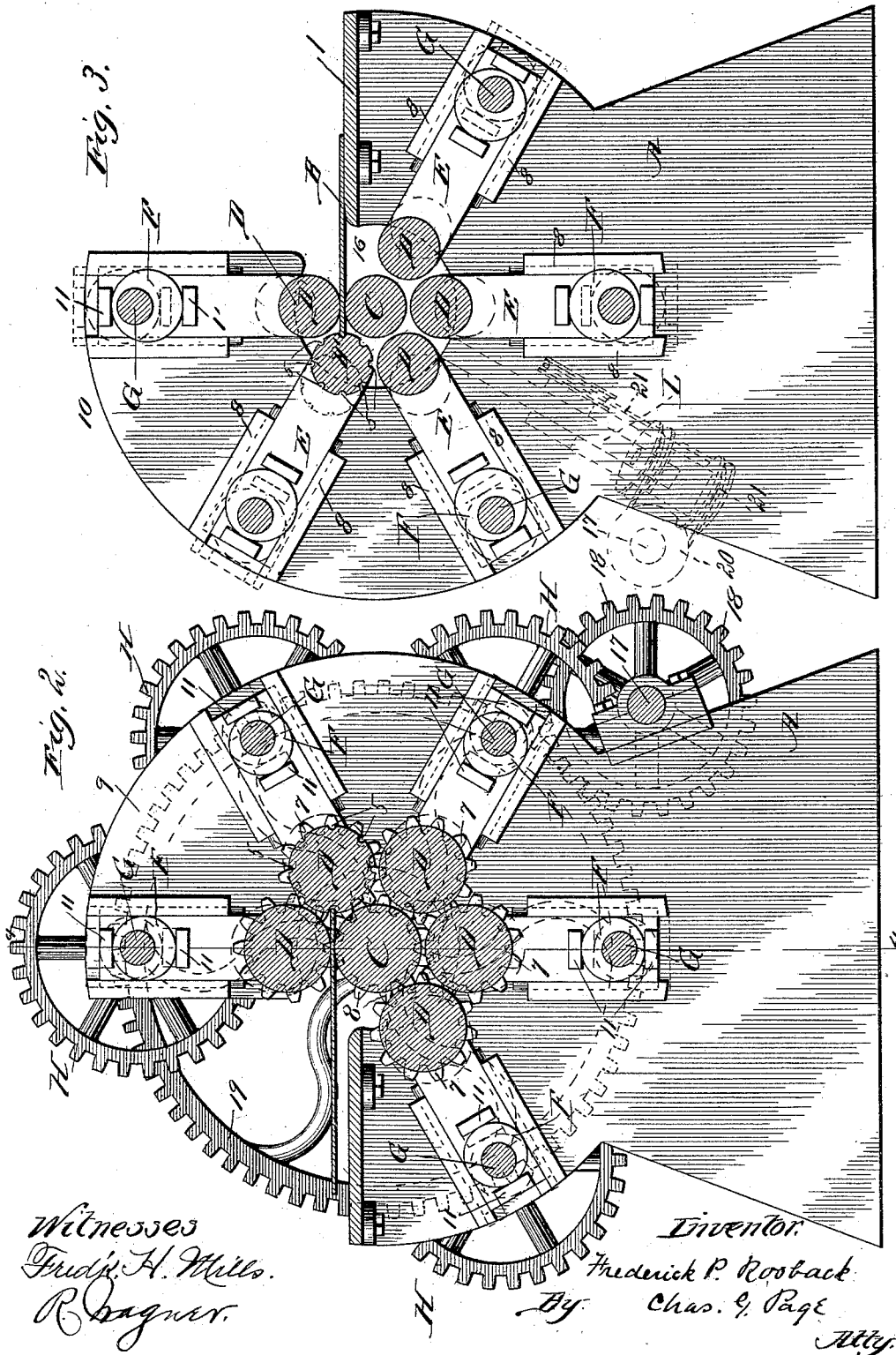
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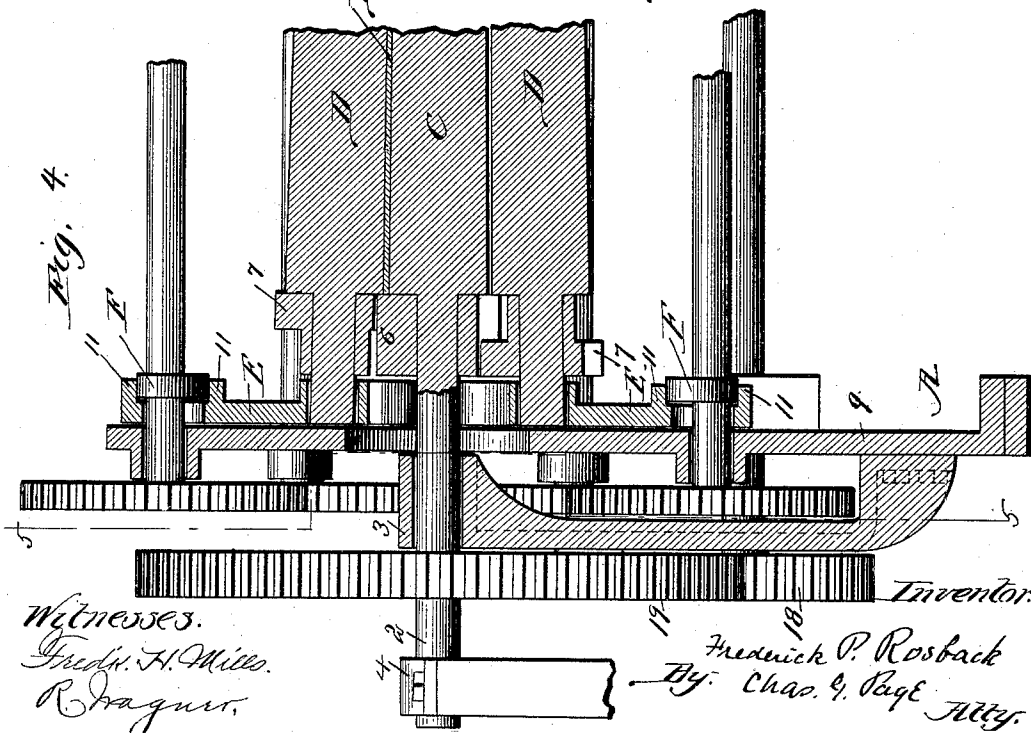
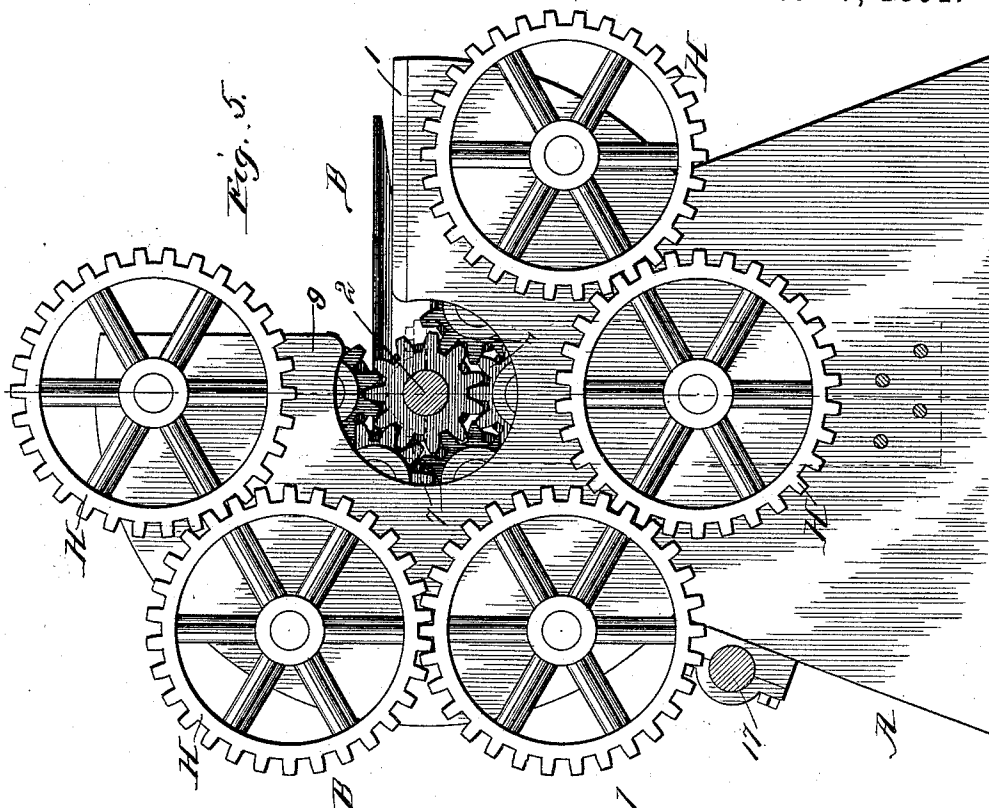
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Witnesses.
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(No Model.)

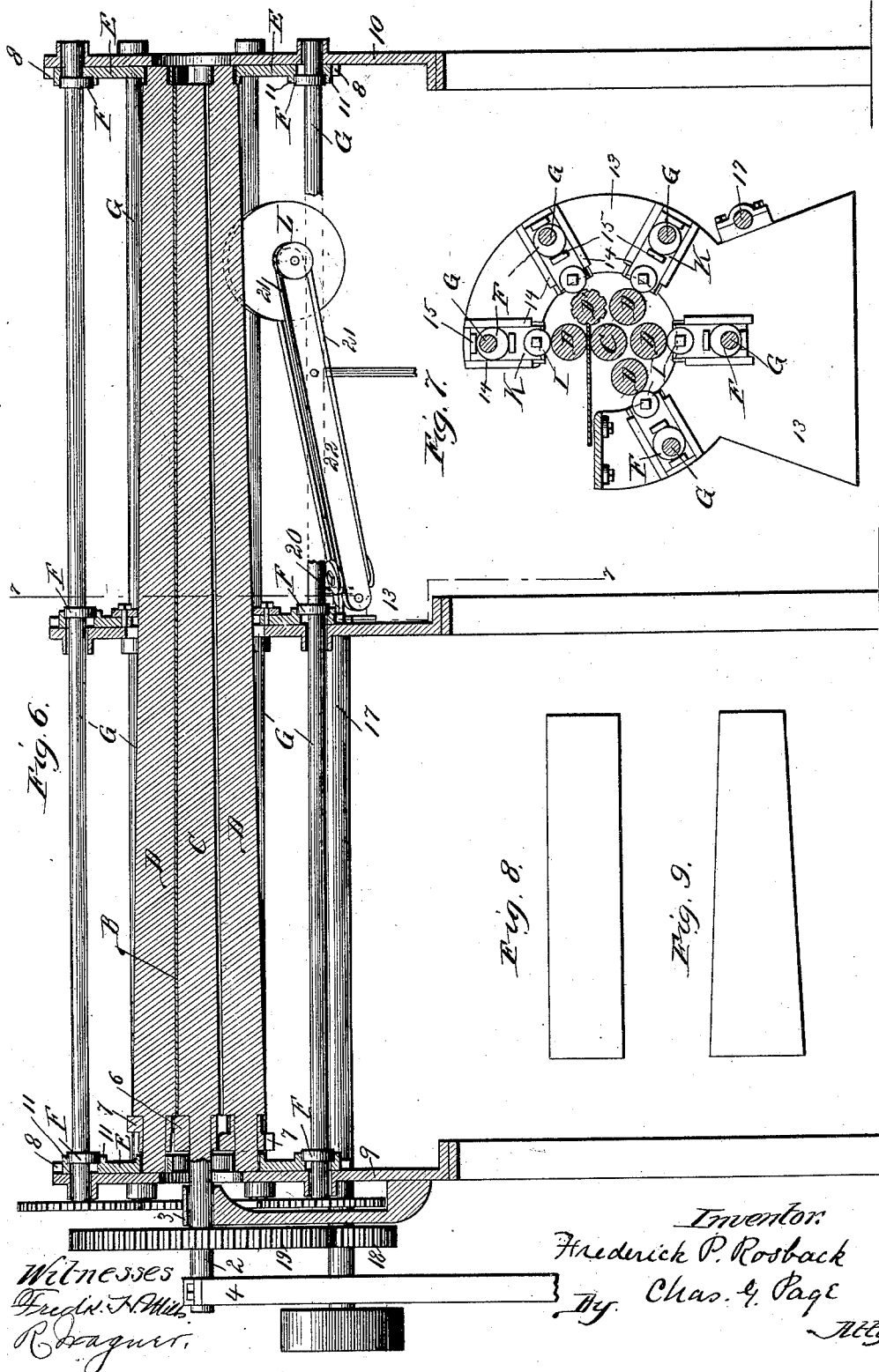
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UNITED STATES PATENT OFFICE.

FREDRICK P. ROSBACK, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF
TO HENRY F. BAND, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR MAKING TUBULAR SHEET-METAL POSTS.

SPECIFICATION forming part of Letters Patent No. 463,201, dated November 17, 1891.

Application filed February 24, 1891. Serial No. 382,374. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK P. ROSBACK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Machines for Making Tubular Sheet-Metal Posts, of which the following is a specification.

The object of my invention, generally stated, is to provide a practical and efficient machine for rapidly and economically making tubular sheet-metal posts, preferably of the form and construction set forth in my application for Letters Patent of the United States filed on or about January 17, 1891, and serially numbered 378,114. As described in my said application, the sheet-metal post is formed from a sheet-metal blank, which is rolled into tubular form with the longitudinal edges of the blank overlapping one another, and as a preferred construction the tubular post thus formed is gradually enlarged in diameter toward one end and left free to further expand in diameter along its larger end portion, so that when the post is driven into the ground the expansion of its end portion which thus penetrates the earth will serve to enlarge the base portion of the post and give it a firmer hold in the ground. To construct such a post of sheet metal (particularly of sheet-steel) it is desirable to so roll the blank that while its overlapping edge portions along a portion of the length of the post are free to move upon and draw away from one another when the post is driven into the ground, the blank rolled up, as aforesaid, shall normally preserve a proper tubular form with its overlapping edges lying closely together. In other words, the blank should be so rolled that when in tubular form it will not of itself spring apart along the seam or line of meeting of its longitudinal edges.

A further important object of my invention is to attain the foregoing recited desired end. While, however, I prefer that the aforesaid sheet-metal tubes or hollow posts shall increase in diameter toward one end, I may produce straight cylindric sheet-metal tubes. To the attainment of the foregoing and

other useful ends my invention consists in matters hereinafter set forth.

In the accompanying drawings, Figure 1 represents in front elevation a machine embodying my invention. Fig. 2 is a section on line 2 2 in Fig. 1, looking in the direction of the arrow. Fig. 3 is a section on line 3 3 in Fig. 1, looking in the direction of the arrow. Fig. 4 is a section through one end portion of the machine on line 4 4 in Fig. 2, the gearing at the extreme end of the machine being, however, shown in elevation. Fig. 5 is a transverse section through the machine on line 5 5 in Fig. 4. Fig. 6 is a vertical longitudinal section taken centrally through the machine, with the gearing at one end thereof omitted for convenience of illustration. Fig. 7 is a section on line 7 7 in Fig. 6. Figs. 8 and 9 represent blanks from which the tubular posts can be formed.

In said drawings, A indicates the main frame, which may be of any suitable construction and which is adapted to support and provide appropriate bearings for the several operative parts of the machine. The main frame is provided with a table 1, which extends substantially the length of the machine and which serves to support a blank in position for its advancement to the shaping-rolls, as in Fig. 3, wherein I have indicated a blank B. The sheet-metal blank is rolled into tubular form about a rotary arbor or mandrel C, which may be either straight, cylindric, or enlarged toward one end, or of other suitable shape, in accordance with the desired shape of the tube that is to be produced. The mandrel C is journaled at one end only, so that after a sheet-metal tube has been formed about it the tube can be slipped off the mandrel. In Fig. 4 I have shown the mandrel C provided at one end with a long journal 2, which is supported in a couple of bearings 3 and 4, so as to properly support and steady the mandrel, although as a matter of course one long bearing can be substituted for the two bearings with the same general result. The mandrel forms the center roll of a group or set of rolls which lie parallel with one another and which operate so as to cause the blank to be drawn between the mandrel

or center roll and the surrounding rolls and so compressed between the same as to give a set to the sheet-metal tube. The rolls D, which are arranged about the mandrel as aforesaid, act both as feed and pressure rolls and are driven in unison with the mandrel, so that when said rolls D are placed in proper juxtaposition to the mandrel the blank will by the conjoint operation of the mandrel and surrounding rolls be drawn about and compressed upon the mandrel.

As a means for giving an initial bend to the blank, so as to deflect its forward edge into the line of a circle passing between the mandrel and surrounding rolls, I provide a roll D', having a set of longitudinally-arranged grooves or corrugations 5, so that when the blank is fed, for example, between the mandrel C and one of the rolls D, as in Fig. 3, its forward edge will be caught by the roll D', which will thereupon bend such edge portion of the blank down upon the mandrel, and hence direct it to the line between the next succeeding roll D and the mandrel. The roll D', with the exception of its corrugations, corresponds generally with any one of the rolls D; but by reason of its said corrugations operates also as a bending or deflecting roll. The corrugations or depressions in the roll D' practically provide it with ribs or teeth, which serve to engage the forward edge of the advancing metal sheet, and hence said roll is practically a toothed roll.

Power can be applied in any suitable way for driving the mandrel, and likewise power can be applied in any suitable way for driving the rolls which lie about the mandrel; but as a special and preferred arrangement the mandrel is at one end provided with a cog 6, which engages cogs 7 on the rolls surrounding the mandrel.

In order to properly form a sheet-metal tube, the rolls surrounding the mandrel should be set close to the same, otherwise a proper set will not be given to the tubular sheet. After the tube has been formed, it is necessary to free the rolls D and D' from the same, so as to permit it to be slipped along and removed from the mandrel. To the attainment of such end the rolls D D' are journaled in adjustable boxes or bearings E, which are adjustable radially to the center roll or arbor C and fitted in guides 8 on the uprights 9 and 10 of the main frame. As a means for synchronously adjusting these bearings E, so as to set the rolls D D' up to and also move them away from the arbor C, I provide cams or eccentrics F, which are fixed upon rock-shafts G and arranged between shoulders 11 on said bearings. The rock-shafts G are arranged parallel with the rolls and have their bearings in the ends 9 and 10 of the main frame. These said rock-shafts also extend beyond one of the ends of the main frame and are connected together by gears H, so

that when one rock-shaft is actuated a like movement on the part of the remaining rock-shafts will take place. As a means, therefore, for operating the rock-shafts, I provide one of them with a hand-lever 12, as in Fig. 1. The gears H are herein shown at the end of the machine whereat driving-power for operating the rotary mandrel is applied; but in practice I prefer arranging said gears at the opposite end of the machine.

The cams or eccentrics at one end of the machine are arranged to have a greater throw than the cams or eccentrics at the opposite end of the machine, in which way, when the two sets of eccentrics are operated for the purpose of moving the rolls D D' away from the arbor C, said rolls will at one end of the machine separate from the arbor to a greater extent than they will at the opposite end of the machine. This will be understood by a comparison of the eccentrics in Fig. 3 with the eccentrics in Fig. 2, it being seen that those in Fig. 3 will impart a greater extent of movement to the bearings with which they engage. Said arrangement insures a constant engagement between the cogs of the rolls D D' and the cog on the arbor, and also adapts the machine to operate with either a straight, cylindric, or tapering mandrel.

In order to relieve the journals of the rolls D D' from the great strain to which they would otherwise be subjected, I provide between the ends of the machine one or more sets of bearing-rolls I, which bear against the rolls D D' and serve to back the same. These bearing-rolls I are conveniently carried by movable bearings K, which are similar to the bearings E. For each set of movable bearings K, I provide an upright 13, constituting a portion of the main frame and generally similar to one of the ends thereof. The bearings K work in guides 14 on the upright 13, and are operated from the rock-shafts G in the same way that the bearings E are operated from said shafts, and to such end each bearing K is provided with shoulders 15, between which an eccentric on one of its rock-shafts is arranged to work. The number of sets of these bearing-rolls will depend upon the length of the mandrel, and for each set I can provide a set of adjustable bearings, and for each set of bearings provide an upright plate or frame-piece 13. These plates or frame-pieces are understood to have suitable openings for the rolls and mandrel, as will be understood by reference to Fig. 3, in which the end plate or frame-piece 10 has an opening, through which the tube can be drawn from the free end of the mandrel.

As a means for operating the rotary mandrel, I have herein provided a pulley-shaft 17, mounted in bearings on the main frame and provided with a gear 18, which engages and operates a large gear 19, fixed upon the mandrel.

In order to remove a completed tube from

the mandrel, I provide a stripper-roll I, Fig. 1, which can be brought into contact with a tube upon the mandrel and driven in any suitable way. For example, the stripper-roll
 5 can be driven from a pulley 20 on shaft 17 through the medium of belting 21, (herein partially shown,) it being understood that the belting can be carried over suitable pulleys on the main frame, and that such will be readily understood without further illustration or
 10 description. The stripper-roll is mounted upon a movable bearing 22, which can be adjusted from a foot-treadle M, whereby by operating the foot-treadle the stripper-roll can
 15 be brought into frictional contact with a tube on the mandrel, and when thus brought into engagement with the tube it will quickly run the tube off from the mandrel.

The blanks from which the tubular posts or the like are to be formed may be either rectangular, as in Fig. 8, or gradually decreased in width from one end to the other, as in Fig. 9, but should be of a width to permit their longitudinal edges to overlap one
 25 another when the blanks are rolled into tubular form. In order to form a tubular post, the blank is simply placed upon the table 1 and advanced so that it will be taken by the mandrel C and the feed and pressure roll just
 30 above it, as in Fig. 3. Thereupon the blank will be fed to the combined feed and bending roll D', which will engage the edge of the blank and turn the same down upon the mandrel, so that as the blank continues to advance its said edge will next be taken by the
 35 mandrel and roll D, next succeeding the roll D', and so on until the tube is completed. In order to thus form and give a set to a comparatively small sheet-metal tube, the feed and pressure rolls must, in practice, set close
 40 up to the mandrel in order to exert a high degree of pressure upon the sheet metal, it being observed that there will be sufficient spring in the bearing connections of the rolls with the main frame to allow the metal sheet
 45 to pass between the rolls and mandrel.

With regard to the stripper-roll, it may be here noted that when the bearings E are moved outwardly there will be sufficient space
 50 for the roll to pass between two of the rolls D, so as to reach a tube upon the mandrel, and that I have in Fig. 3, for example, shown a space between the rolls D and mandrel C, merely for clearness of illustration.

55 What I claim as my invention is—

1. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of a
 rotary mandrel, a set of rotary feed and pressure
 60 rolls arranged about the rotary mandrel, and a toothed roll D', adapted to engage the forward edge of the blank and bend the same down upon the mandrel, for the purpose set forth.

65 2. The combination, substantially as here-
 inbefore set forth, in a machine for making

tubular sheet-metal posts and the like, of the
 mandrel C, a set of rotary feed and pressure
 rolls arranged about the mandrel, a set of
 adjustable bearings for said rolls connected
 70 to have a synchronous adjustment, and means for simultaneously adjusting said bearings.

3. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of the
 75 mandrel, a set of rotary feed and pressure rolls arranged about the mandrel, adjustable bearings E for said rolls, and a set of gear-connected rock-shafts from which said bearings
 80 are adjusted.

4. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of the
 mandrel, a set of feed and pressure rolls
 85 arranged about the mandrel, adjustable bearings for said rolls, and a set of gear-connected rock-shafts provided with cams or eccentrics engaging said bearings, for the purpose described.

5. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of the
 mandrel, pressure-rolls D, and a toothed
 pressure and bending roll D', arranged about
 95 the mandrel, and adjustable bearings for said rolls, and means for adjusting said bearings.

6. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of a
 100 rotary mandrel C, journaled at one end and having its opposite end free to permit the removal of a completed tube, a toothed roll D' for engaging and bending the forward
 105 edge of a blank down upon the mandrel, and a set of rolls for pressing and shaping the blank upon the mandrel, said rolls being all adjustably held so that they can be moved away from the mandrel in order to allow the
 110 completed tube to be removed therefrom.

7. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of the
 rotary mandrel, a set of rotary feed and
 115 pressure rolls arranged about the rotary mandrel and mounted in adjustable bearings, and a set of bearing-rolls supported by adjustable bearings and arranged to back said
 120 feed and pressure rolls, for the purpose described.

8. The combination, substantially as here-
 inbefore set forth, in a machine for making
 tubular sheet-metal posts and the like, of the
 mandrel, rotary feed and pressure rolls
 125 arranged about the mandrel, bearing-rolls arranged to back the feed and pressure rolls, adjustable bearings for all of said rolls, and means for adjusting said bearings.

9. The combination, substantially as here-
 inbefore set forth, in a machine for making
 130 tubular sheet-metal posts and the like, of a rotary mandrel from which the tube after

completion thereon can be removed, and a stripper-roll for removing the completed tube from the mandrel.

10. The combination, substantially as here-
5 inbefore set forth, in a machine for making tubular sheet-metal posts and the like, of the mandrel D and a stripper-roll carried by

an adjustable support and operated from a suitable source of power, for the purpose specified.

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Witnesses:

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