

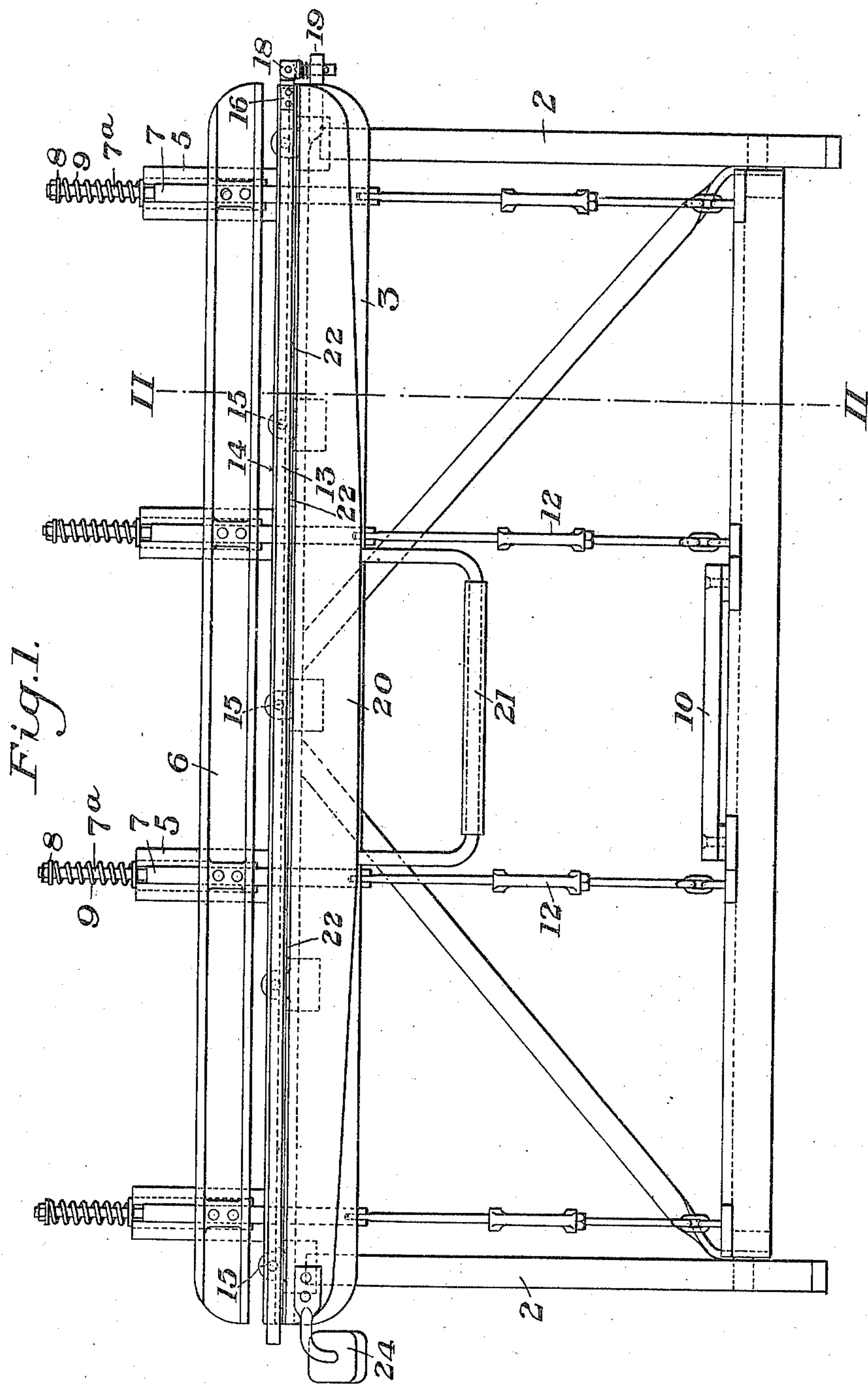
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SHEET METAL BENDING MACHINE.

APPLICATION FILED JUNE 11, 1908.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 1.



WITNESSES

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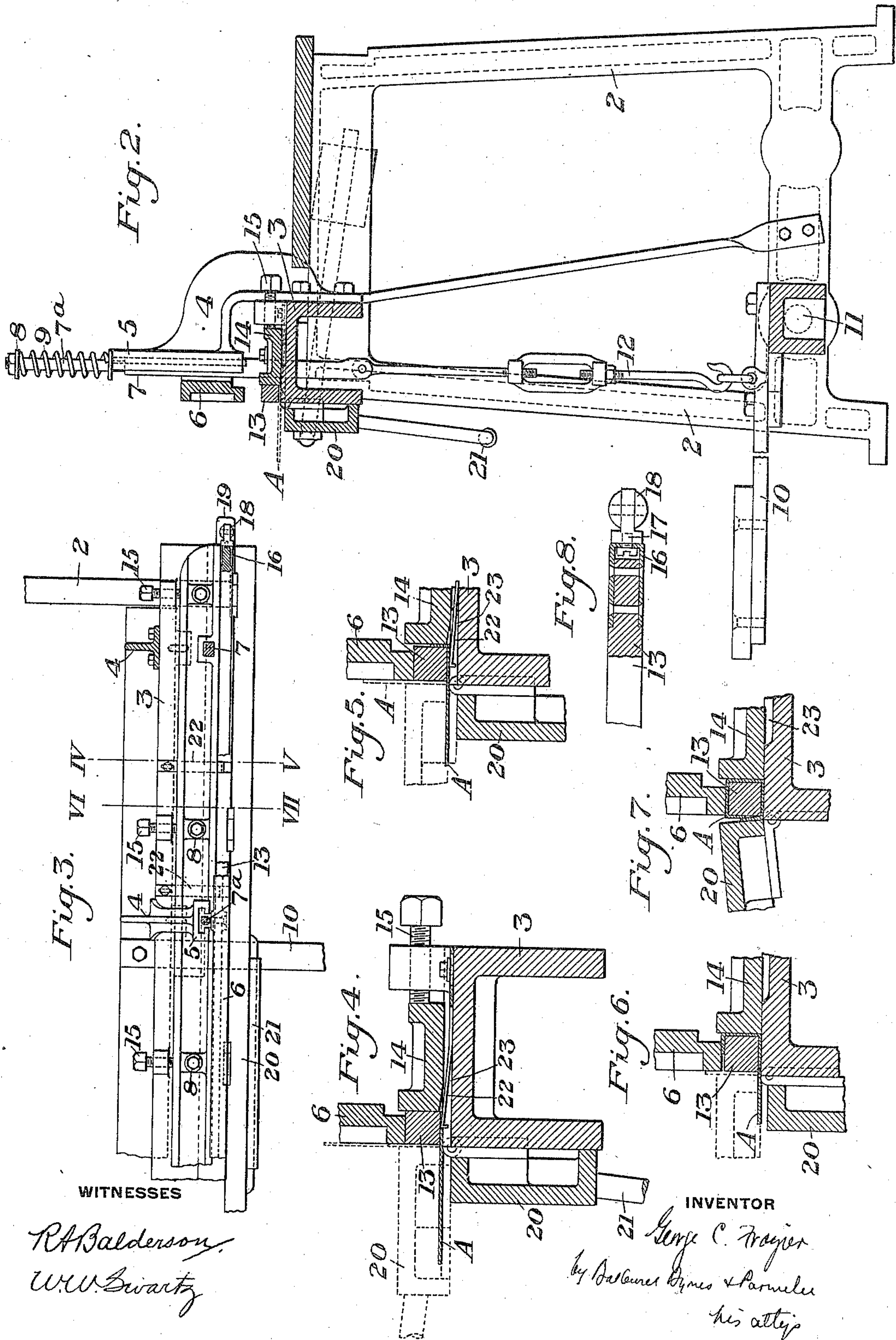
INVENTOR

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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

GEORGE C. FRAZIER, OF PITTSBURG, PENNSYLVANIA.

SHEET-METAL-BENDING MACHINE.

951,639.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed June 11, 1908. Serial No. 437,919.

To all whom it may concern:

Be it known that I, GEORGE C. FRAZIER, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Sheet-Metal-Bending Machine, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a machine embodying my invention; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a plan view partly in section of a portion of the machine; Figs. 4 and 5 are fragmentary sections taken on the line IV—V of Fig. 3, and illustrating different stages of the bending operation; Figs. 6 and 7 are similar views taken on the line VI—VII of Fig. 3; and Fig. 8 is a detail view showing the swivel connection for one end of the former bar or mandrel.

My invention has relation to the class of sheet metal bending machines, and is designed to provide a simple and efficient machine by means of which sheet metal may be readily bent into tubular or other hollow shapes.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement by those skilled in the art without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the frame of the machine, upon which is supported a table 3. Rising from the upper portion of the frame of the machine are overhanging arms or brackets 4, 4, provided with guides 5 in which a holding bar or jaw 6 is mounted to reciprocate toward and away from the table 3, this bar extending preferably the full length of the table and above the same. The bar is provided with the guiding portions 7, having upwardly extending rods 7^a with heads 8 at their upper ends between which and the upper ends of the arms or brackets 4 are interposed springs 9.

10 is a foot lever or treadle, which is pivoted at 11 in the base of the frame, and which is connected with the bar 6 by the links 12. When this foot lever or treadle is actuated the bar 6 will be pulled

downwardly toward the table, thereby compressing the springs 9 and as soon as the foot lever or treadle is released these springs act to raise the bar to the position shown in Figs. 1 and 2.

13 designates a former bar or mandrel, which is arranged to be supported upon the front edge of the table 3 against a back stop 14, which is adjustable toward and away from the edge of the table by any suitable means, such as the screws 15. This bar is shown in the drawings of rectangular cross-section, but it may be circular or of any cross-section corresponding to the cross-section of the hollow sheet metal article to be formed. For convenience of manipulation, this bar 13 is shown as provided with a swivel head 16 at one end arranged to turn on the screw or pin 17 of a swivel 18, which is removably secured in an eye or lug 19 of the machine frame.

20 designates a bending member or bar, which is pivoted to the frame 2 at a point adjacent to the front edge of the table 3, and which preferably extends the full length of the table. This bending bar normally hangs down against the front side of the table, as shown in Figs. 1 and 2, and is provided with a suitable operating handle 21.

22 designates edge stops for the metal to be bent in commencing the bending operation. These edge stops are preferably adjustable spring arms, which can be depressed into recesses 23 in the upper face of the table 3 in the manner hereinafter described. They are adjustable toward and away from the edge of the table 3.

The operation is as follows: One edge of the sheet metal to be bent, indicated at A in the accompanying drawings, having been cut to proper dimensions, is inserted underneath the former bar or mandrel 13 in the manner indicated in Fig. 4, being stopped by its engagement with the edge stops 22. The bending member or bar 20 is then turned upwardly into the position shown in dotted lines in Fig. 4, thus bending the metal upwardly against the outer vertical face of the bar 13, as indicated in dotted lines in said figure. The bar 13 is then turned through 90 degrees into the position shown in Fig. 5, the metal sheet being turned with the bar. The bending member 20 is again operated to again bend the free portion of the metal sheet upwardly against the outer face of the former bar. The latter is now turned

through another 90 degrees into the position shown in Fig. 6, and the bending operation is again repeated. The former bar is then given another turn into the position shown in Fig. 7, and the bending bar 20 again operated. This forms the complete hollow article shown in section in Fig. 7, and which is then removed from the mandrel.

To facilitate the operation of the bending bar, it may be provided with a suitable counterweight 24. It will be understood that before each operation of the bending member 20 the treadle will be operated to bring the holding bar 6 down into holding engagement with the mandrel. The edge stops 22 are used simply in commencing the operation, as shown in Fig. 4, and in the subsequent bending steps these stops are depressed into the recesses 23.

My invention provides means whereby hollow sheet metal shapes of various cross-sections can be readily and cheaply made.

The machine is simple, in its construction and operation, and the former bar or mandrel is so arranged that it can be readily removed and replaced by one of a different size or cross-section.

It will be obvious that various changes may be made in the details of construction and arrangement. Thus, various means may be provided for operating the holding bar; the mandrel instead of being attached to the frame by the swivel connection may be a loose bar, or it may be connected to the frame in other ways; and the arrangement of the edge and back stops may be changed.

What I claim is:—

1. In a sheet metal bending machine, a table, a rotatable former bar or mandrel, means for holding the same in its different positions, a bending member arranged to bend the metal against the former bar or

the mandrel, and yielding edge stops located in transverse recesses in the table and under the mandrel for the metal; substantially as described.

2. In sheet metal bending machines, a table, a rotatable former bar or mandrel having a plurality of flat faces and which is rotatably mounted above the table, a back stop or rest for the mandrel, edge stops for the metal located in recesses under the mandrel, means for holding the mandrel in its different positions, and a bending device arranged to bend the metal against the mandrel; substantially as described.

3. In a metal bending machine, a frame, a table supported thereon, a former bar or mandrel having a loose connection with the machine and arranged to be rotated about its own axis thereon, edge stops for the metal below the mandrel, a reciprocating clamp for holding the former bar or mandrel on the table, a foot treadle operatively connected to said clamp, means to elevate the clamp, and a bending member for bending the metal against the mandrel; substantially as described.

4. In a sheet metal bending machine, a table, a mandrel adapted to be supported on the edge portion of said table, and to be turned thereon about its own longitudinal axis, a bending member pivoted to the machine frame adjacent to the mandrel, a yielding edge stop for the metal located in a recess in the table, and means for clamping the mandrel on said table; substantially as described.

In testimony whereof, I have hereunto set my hand.

GEO. C. FRAZIER.

Witnesses:

H. M. CORWIN,
GEO. H. PARMELEE.