

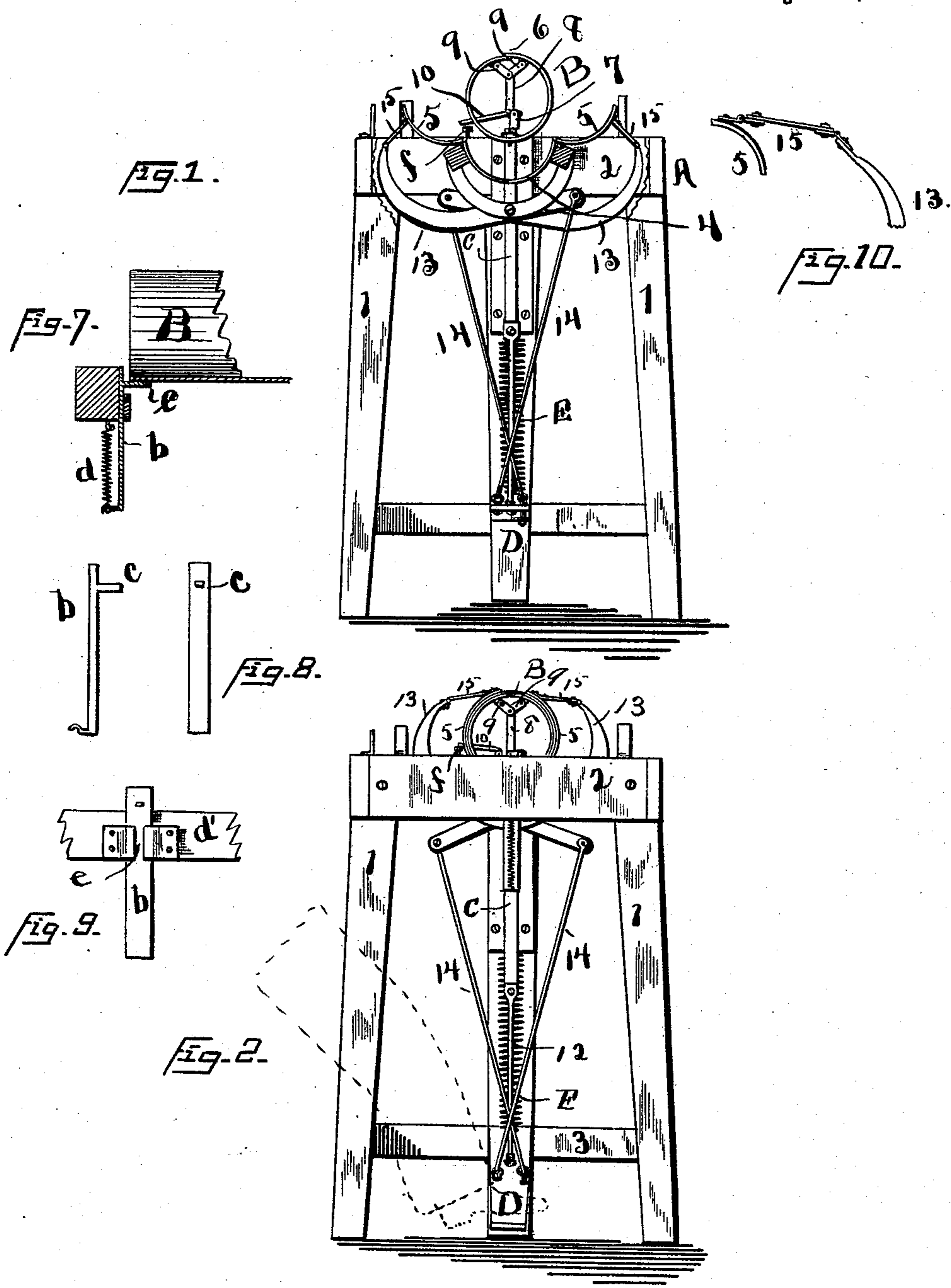
(No Model.)

2 Sheets—Sheet 1.

J. CLARK.
FORMING MACHINE.

No. 539,856.

Patented May 28, 1895.



WITNESSES:

M. M. Borst.
Chas. W. Mann.

INVENTOR
Jasper Clark.

BY
Smith & Thomson
ATTORNEYS.

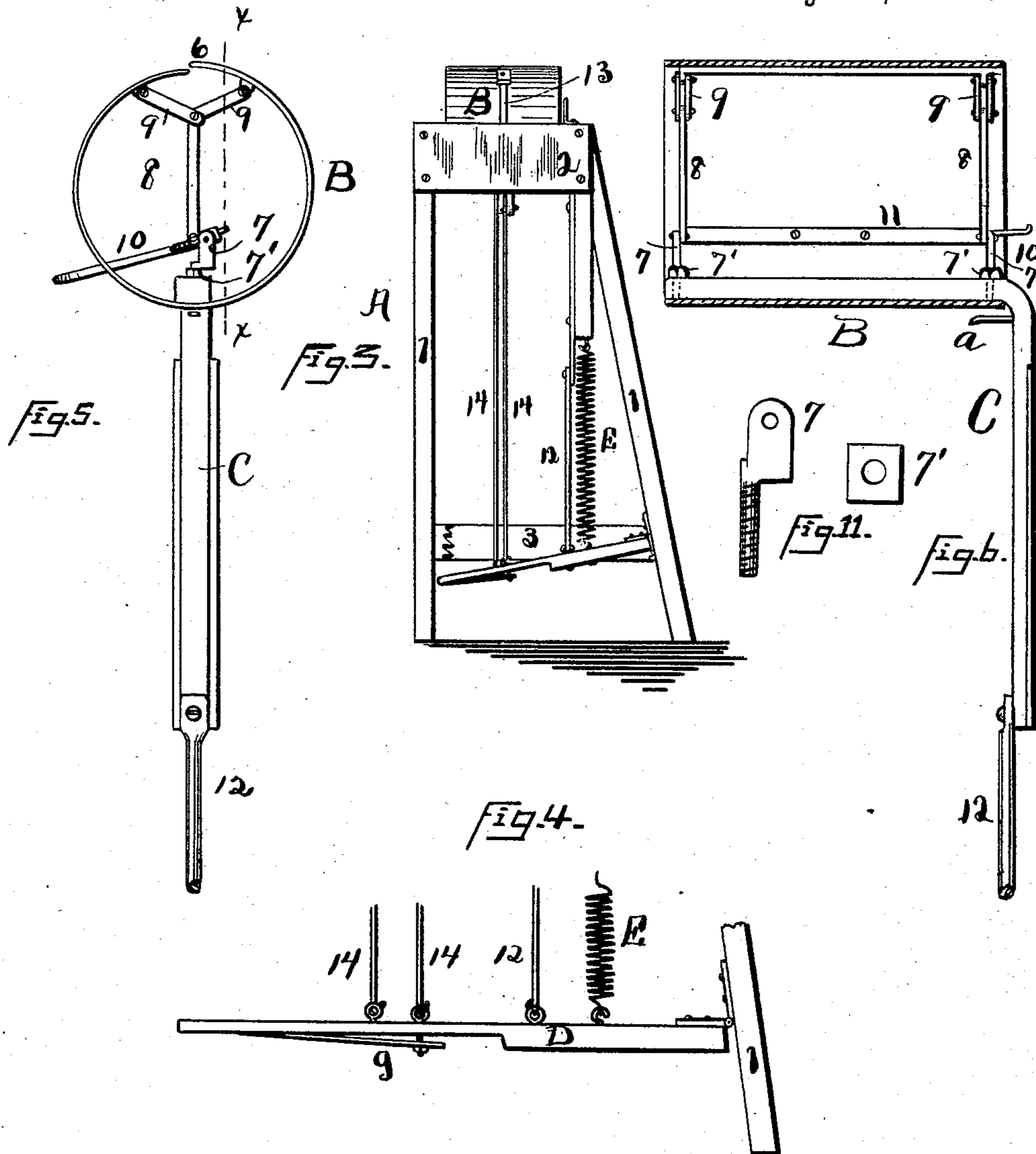
(No Model.)

2 Sheets—Sheet 2.

J. CLARK.
FORMING MACHINE.

No. 539,856.

Patented May 28, 1895.



WITNESSES:

M. M. Borst.

Chas. W. Marvin.

INVENTOR

Jasper Clark.

BY

Smith & Johnson

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JASPER CLARK, OF ELMIRA, NEW YORK.

FORMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 539,856, dated May 28, 1895.

Application filed June 22, 1894. Serial No. 515,350. (No model.)

To all whom it may concern:

Be it known that I, JASPER CLARK, of Elmira, in the county of Chemung, in the State of New York, have invented new and useful

5 Improvements in Forming-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to machines for forming the bodies of tin cans, or other cylindrical bodies made of sheet metal, and holding them in shape and position while the meeting edges, or sides, are being soldered together.

My object is to produce such a machine, 15 cheap and durable in its construction and of great utility; and to that end my invention consists, first, in providing a mandrel capable of being expanded and contracted at will; second, in providing means for holding the 20 metal close to the mandrel for the purpose of forming a cylinder of the exact size of the mandrel; third, in providing means for allowing one edge of the sheet metal to overlap the opposite meeting edge, and in the several 25 other new and novel features and combination of parts hereinafter described and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying 30 drawings, in which—

Figure 1 shows a front end view of the machine complete, ready for operation. Fig. 2 shows a similar view after the metal has been pressed against the mandrel, the foot-power, 35 however, applied from the side instead of the front, as is usual, so as not to obscure some of the operating parts. Fig. 3 is a side view thereof, the foot removed. Fig. 4 is an enlarged detail of the foot-lever, showing the connections thereto. Fig. 5 is an enlarged 40 end view of the mandrel and means for expanding or contracting it, with the connecting operating-rod detached. Fig. 6 is a view on line *x x* in Fig. 5. Fig. 7 is a vertical section 45 taken through one end of the mandrel, showing the support at its rear end for the sheet metal. Fig. 8 shows a side and front view of the yieldingly-mounted arm which engages with the sheet metal. Fig. 9 is an enlarged 50 detail front view of said arm mounted. Fig. 10 is an enlarged detail of one of the actuating-arms and the hinge connection between

it and the clamping-arm, and Fig. 11 is a view of the standard and adjusting-nut.

—A— is a frame, comprising uprights —1— 55 and cross-bars —2— and 3, all constructed in the ordinary manner.

—4— is a concave mandrel socket securely mounted and supported transversely across the upper end of the frame, as shown in Fig. 1, 60 and —5— shows convex clamping arms hinged at their lower sides to the upper edge of the mandrel socket so as to form, with said socket, a cylinder, or inclosing jacket, when the metal is being formed into the body of the cylinder. 65

—B— is a mandrel, constructed substantially as shown, being open upon its upper edge, as shown at —6—, for the purposes hereinafter set forth, and is mounted upon a bracket —C—, as shown in Fig. 6; and —7— 70 shows uprights mounted within the cylinder upon the bracket —C—, having a rigid connection —8— between them and the links —9—, which are connected to the opposite meeting edges of the mandrel, as shown; and 75 —10— is a lever connecting with the rod —11— which connects the standards —7—, and permits of raising or lowering the connection —8— at will for the purpose of throwing the meeting edges of the mandrel —B— 80 in or out as it is desired to expand or contract the mandrel for the purpose of making it larger or smaller, to suit itself to cans, or cylinders, of various sizes. Inside of the mandrel, at each end, is placed a screw threaded 85 upright or standard 7, formed as shown in Fig. 11, and which uprights or standards are placed in holes in that part of the bracket C which extends through the mandrel. Between the head on each upright and the top of the 90 bracket C, is placed an adjusting nut 7', by means of which either one or both of the uprights can be raised or depressed at will, for the purpose of enabling the lever 10 to force the edges of the mandrel apart or make them 95 overlap to a greater or less extent, the object of this being to enable me to change the size of the mandrel at either end without disturbing the other end, as it is desirable often to change the size of one end without disturbing the opposite end in order to adapt it to heads of different sizes. The upper end of the bracket is turned at a right angle and extends entirely through the bottom of the man- 100

drel, which is rigidly secured thereto, the vertical part of the bracket is connected at its lower end by the rod 12 to the treadle which supports it, and holds it and the mandrel secured to it, in a normally raised position. Guides on the frame hold the bracket in position and guide it in its movements. The spring E is secured to the frame at its upper end and to the treadle at its lower one, so that as soon as the treadle is released from the pressure of the foot, the spring instantly raises the treadle and through it the bracket and mandrel.

Beneath the mandrel socket are mounted two oppositely arranged operating levers —13—, having one end connected to the connecting rods —14—, the opposite ends of said connecting rods being secured to the foot-lever, and —15— is a hinge connection connecting each clamping arm with the upper end of its operating lever.

Upon the inner edge of the bracket —C— is a lug, or small arm —a—, a short distance below the mandrel, for the purpose of holding the sheet metal up tight to the lower face of the mandrel while it is being formed, and beneath the opposite end of the mandrel is mounted an arm —b— having a lug —c— extending inwardly for the purpose of clamping the metal and holding it securely against the bottom of the mandrel which, together with the lug, or arm —a—, above referred to, tends to hold the sheet metal taut about the lower face of the mandrel so as to make the cylinder exactly the size of the mandrel.

The arm *a* always remains in a fixed relation to the under side of the mandrel, but the lug *c*, on the spring actuated vertically moving arm *b*, follows the up and down movement of the mandrel for the purpose of holding the sheet of metal against its under side, until the mandrel has reached the highest point to which it is moved by the spring E. The spring *d* moves the lug *c* up, when the mandrel is raised to its highest position, to within a short distance of the under side of the mandrel, leaving just room enough to freely insert the plate before being bent, and to remove it after having its edges soldered together.

The arm —*b*— is connected at its lower end with a spring —*d*—, and thence to the frame, and mounted in a strap —*d'*— having a vertical slotway —*e*— to allow the lug —*c*— to pass through when the mandrel moves downwardly.

It will be observed that when a piece of sheet metal is placed over the mandrel socket and up against the mandrel, between it and the lugs —*a*— and —*c*—, above referred to, the foot is then applied to the treadle —D— which, in turn, brings the mandrel down into the socket, at the same time the operating levers —13— throw the clamping arms —5— up, forcing the metal completely about the mandrel, as shown in Fig. 2, and holding it there until the edges have been soldered, or

otherwise secured together. It will also be observed that a thumb-screw —*f*— is secured upon the upper end of the frame, with which the lever —10— comes in contact, for the purpose of varying the size of the mandrel.

The size of the mandrel is immaterial before it is depressed into its socket, but when it enters the socket it should have the exact size desired. The set screw having been adjusted, as the mandrel is depressed the lever strikes against it and at once closes the mandrel to the regulated size.

It will also be observed that the lower end of one of the connecting rods —14— is yieldingly secured to the treadle —D— by means of the spring —*g*—, so that when the clamping arms force the sheet metal together they will allow one side to yield so as to overlap the other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a forming machine, a frame, a stationary mandrel socket, and a mandrel yieldingly mounted above the socket, combined with clamping arms, and means for operating the mandrel and the clamping arms simultaneously, substantially as shown.

2. In a forming machine, a frame, a stationary socket, and an expansible mandrel yieldingly mounted above the socket, combined with clamping arms, and means for operating the mandrel and clamping arms simultaneously, substantially as described.

3. In a forming machine, a stationary socket mounted upon a suitable frame, and a mandrel vertically movable in relation to the socket, combined with a pair of levers connected to the socket, arms operated by the levers, and means for moving the mandrel vertically and operating the arms and levers simultaneously, substantially as set forth.

4. In a forming machine, a suitable frame, a stationary mandrel socket mounted thereon, and a mandrel vertically movable in relation to the socket, combined with levers connected to the socket, arms for clamping the upper portion of the mandrel, connections for uniting the outer ends of the levers and the arms, and a treadle mechanism for operating the mandrel, the levers and the arms simultaneously, substantially as specified.

5. In a forming machine, a frame, a stationary socket thereon, a mandrel yieldingly mounted above the socket, and means for holding the sheet metal close to the lower face of the mandrel, combined with pivoted levers, arms connected to the levers for forcing the metal against the mandrel, and means for operating the mandrel, the levers and arms at the same time, substantially as shown.

6. In a forming machine, a suitable frame, a stationary socket mounted thereon, a vertically moving mandrel, and a means for depressing and raising it, arms connected to the socket, pivoted levers connected to the arms, and connections between the levers and the

treadle, one of the connections between the treadle and one of the levers being yielding, substantially as set forth.

7. A stationary socket, and a vertically moving mandrel, combined with a vertically moving bracket secured to the mandrel, a treadle for raising and lowering the mandrel, and a spring secured to the frame at one end and to the treadle at the other, the mandrel being raised and lowered in a horizontal position, substantially as specified.

8. The frame, a stationary socket mounted thereon, the mandrel, the vertically movable bracket to which the mandrel is secured, and a treadle to which the lower end of the bracket is secured, combined with the pivoted arms, the pivoted levers for operating the arms, a rigid connection between one lever and the treadle, and a yielding connection between the other lever and the treadle, substantially as shown.

9. An expansible mandrel, combined with an operating lever, a horizontal rod connected to the lever, a support at each end of the rod; the vertical rods 8, and links 9 which connect said horizontal rod with the free edges of the mandrel; the horizontal rod being mounted in suitable bearings inside of the mandrel, substantially as described.

10. An adjustable mandrel and means for expanding and contracting it, combined with a vertically adjustable support, placed in each end of the mandrel, and which are independent of each other and upon which the expanding and contracting devices are mounted, substantially as described.

11. An adjustable mandrel, and means placed inside of it for expanding and contracting it, combined with adjustable supports placed inside of the mandrel which can be raised and lowered independently of each other, so that one end of the mandrel can be made larger or smaller than the other, substantially as set forth.

12. The supporting frame, and a set screw mounted thereon, combined with a fixed

socket, a vertically moving mandrel in relation to the socket, means inside of the mandrel for expanding and contracting it, and a lever connected with the expanding and contracting mechanism for striking against the screw, substantially as specified.

13. A mandrel, adjustable in size, and a mechanism for moving it vertically, combined with an expanding and contracting mechanism placed inside of the mandrel, and constructed for automatic operation as the mandrel is depressed, substantially as shown.

14. The vertically moving mandrel, and a support *a* placed under one end, combined with a spring actuated support *c* placed under the opposite end, substantially as described.

15. The vertically moving mandrel, and the support or lug *a*, placed under one end thereof, combined with the spring actuated slide *b*, placed under the opposite end and carrying the lug *c*, adapted to support one end of the sheet of metal against the mandrel, substantially as set forth.

16. The mandrel, the bracket passing through the mandrel, and to which end the mandrel is secured, the supports 7, the nuts placed on the supports, the expanding and contracting mechanism mounted on the supports, and a lever for operating the expanding and contracting mechanism, substantially as specified.

17. The pivoted levers for closing the arms around the top of the mandrel and the operating rods 14, connected to the lower ends of the levers, combined with the treadle to which the lower end of one of the rods is connected, and the spring *g*, secured at one end to the treadle, and to the free end of which the lower end of the other rod 14 is fastened, substantially as shown.

In witness whereof I have hereunto set my hand this 11th day of June, 1894.

JASPER CLARK.

In presence of—

J. N. LAKE,

JAMES M. MOCKLER.