(No Model.) 2 Sheets—Sheet 1.

C. F. TEBBETTS.

MACHINE FOR ROLLING METAL ARTICLES TO FORM.

No. 384,878. Patented June 19, 1888.

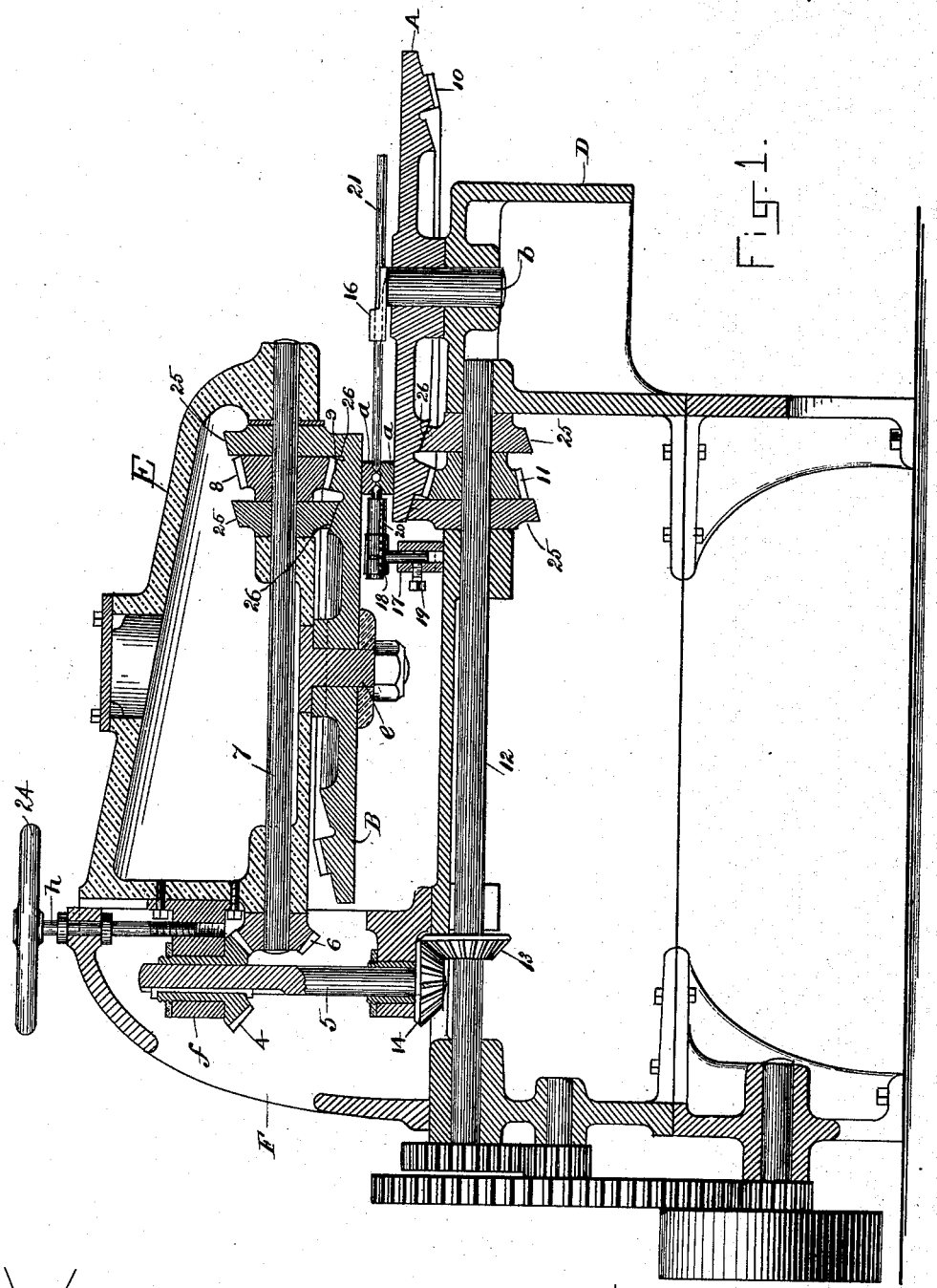

Fig. 1.

WITNESSES:
H. C. Stratton
E. E. Hamill.

INVENTOR:
Chas. F. Tebbetts
By
C. B. Tuttle

(No Model.) 2 Sheets—Sheet 2.

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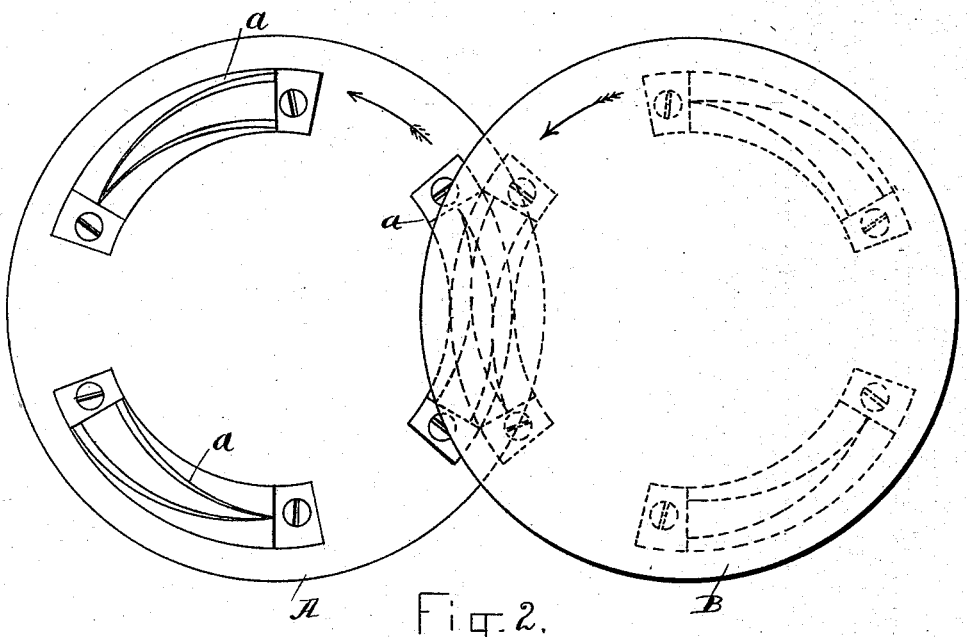

Fig. 2.

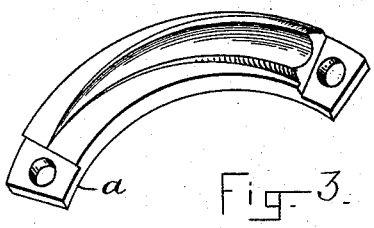

Fig. 3.

WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES F. TEBBETTS, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO THE TEBBETTS ROLLED FORGING AND MACHINE COMPANY, OF KITTERY, MAINE.

MACHINE FOR ROLLING METAL ARTICLES TO FORM.

SPECIFICATION forming part of Letters Patent No. 384,878, dated June 19, 1888.

Application filed December 15, 1887. Serial No. 257,936. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. TEBBETTS, of Fitchburg, county of Worcester, and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Rolling Metal Articles to Form, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to machines for rolling metal articles spherical, cylindrical, or other contour having circular cross-sectional area, and the nature thereof is fully described and then specifically claimed hereinafter.

In the drawings, Figure 1 is a vertical central section of a machine constructed in accordance with and embodying this invention. Fig. 2 is a plan view of the die-platens and dies mounted thereon. Fig. 3 is a perspective view representing a die for making spheres or balls.

It should be understood that the dies are used in pairs and move in opposite directions past each other to compress and shape articles of metal or other suitable material rolled on their axis between them; and this invention relates mainly to the mechanism for supporting and operating the dies. It also relates to matters of construction and arrangement of a gage to assist the workman in positioning the metallic rod relatively to the approaching dies, as hereinafter more fully described.

The dies have been described in Letters Patent of the United States No. 367,682, heretofore granted to me, and to which reference may be had. These dies are mounted upon revolving platens A B, as shown in Fig. 2. The platen A is mounted upon a pin, *b*, which pin is supported in the machine-frame D. The platen bears its central hub upon the frame D and permits being revolved on the pin. The platen B is supported in a similar manner on the pin *e*, which pin is fixed to the vertically-movable arm E. Said arm E is arranged to slide vertically up and down its supporting standard or shell F, and to this end it is provided with appropriate grooves to receive the projecting edges (not shown) of the standard F, whereby it is supported. The standard F consists of a hollow shell formation projecting upward from the machine-frame D, to which it is firmly and immovably fixed.

Extending from the arm E is a boss, *f*, which may be formed integral with the arm, or, preferably, a separate piece suitably bolted to the arm, as represented in Fig. 1. This boss extends rearward through a suitable opening in the standard F, and is provided with a socket and screw-thread to receive shaft *h*, as shown, whereby the upward and downward movements of the arm are effected in an obvious manner. Said boss is further provided with a crown-gear, 4, which is journaled to permit revolving in its supporting-boss. Said gear is arranged upon the vertical shaft 5 and permits longitudinal sliding movement on the shaft. It is suitably splined to be revolved by the shaft. Said gear meshes with a similar gear, 6, on shaft 7, which shaft 7 is arranged to revolve in its supporting-arm E, and carries a gear, 8, that engages the gear 9, which is formed integral with the platen B. In other words, it engages a system of gear-teeth, 9, cut in a circle on the rear face of the platen B. Connected and integral with the platen A is a similar gear or system of gear-teeth, 10, that engage a gear, 11, on the shaft 12. Said shaft 12 is journaled in the machine-frame B, and is revolved by a suitable driving mechanism, as represented.

On the shaft 12 is a gear, 13, that engages with a gear, 14, and transmits the motion of shaft 12, through intermediate mechanism, to the shaft 7, thus compelling the shafts 7 and 12 to revolve simultaneously, to the end that the platens A B may be turned on their pivotal pins simultaneously in opposite directions, for the purpose of bringing the forming-dies into position for molding the intended article. The die-platens are driven continuously round and bring the dies into action successively, and I prefer to mount a series of dies on each platen, each pair of which may be brought into action while the others are being carried round the circuit. This enables me to keep the machine in constant use without overheating the dies. The dies when out of use and passing round the circuit are constantly cooling.

The series may be enlarged to a greater number than shown in the drawings, or diminished to a smaller number, if desired, without departing from the spirit of this invention. In the drawings three pairs of dies are shown, all of which are for making metallic balls; but instead of the dies being all alike each pair may be designed for forming different articles. The

dies and their operation upon the metal is fully described in the Letters Patent above referred to.

Supported on the pin *b* is a rest, 16, in which the metallic bar is rested, as shown. Attached to the machine-frame D is a hollow standard, 17, adapted to receive and support, as shown in Fig. 1, the gage 18. Said gage comprises also the horizontal tube 20, and is vertically adjustable by means of a screw, 19. It may be lifted and depressed to meet the requirements of different-sized dies. The tube 20 is made adjustable longitudinally by the screw 22, to the end that it may be moved up to or away from the dies. It has a central bore to receive and support the end of the rod 21. The small tip of metal removed from the end of the rod 21 by action of the dies remains in the tube, and is pushed rearward by the next forward movement of the rod 21, and so on till it finally drops out of the tube and falls to the machine-frame or floor below.

Whenever it becomes necessary to separate the platens to permit the introduction of different-sized dies, it may be done by an obvious turn of the wheel 24, which lifts and depresses the supporting-arm E. On the shaft 7, also on the shaft 12, are conical wheels 25, that bear and travel on a suitable path, 26, on the die-platens. These wheels are on opposite sides of the dies *a a* while operating on the metallic bar and support the die-platens to prevent their being broken or cramped.

As an aid in understanding the construction of the dies and the operation thereof upon the metallic bar and other minor matters, reference may be had to the Letters Patent above referred to.

I am aware that machines for rolling metal articles to form having revolving platens and forming-dies mounted upon the curved faces thereof are not new, and I do not claim the same as a part of my invention; but

What I do claim, and desire to secure by Letters Patent, is—

1. In a machine for rolling metal articles to form, the combination of two plane-faced rotary die-supporting platens, as A B, a two-part forming-die mounted, one member on the plane face of one and the other member on the opposing plane face of the other platen, and means for rotating the platens progressively, to bring the co operating die members up to and past each other repeatedly, substantially as described.

2. In a machine for rolling metal articles to form, two pivotally-supported plane-faced rotary die supporting platens, one or more two-part forming-dies, one member of each die being mounted on the plane face of one and the co-operating members on the opposing plane face of the other platen, and means for rotating the platens progressively, substantially as and for the purposes described.

3. In a machine for rolling metal articles to form, the combination of two die-supporting platens and a series of two-part forming-dies, one member of each die being mounted on one and the co-operating members on the opposing face of the other platen, respectively, and supporting and operating mechanism whereby the platens are moved progressively to make the die members approach and pass each other, substantially as described.

4. In a machine for rolling metal articles to form, the combination of two plane-faced rotary die-supporting platens, as A B, a two-part forming-die mounted, one member on the plane face of one and the other member on the opposing plane face of the other platen, and means for rotating the platens progressively, to bring the co-operating die members up to and past each other repeatedly, and a gage for supporting the metallic rod operated on between the dies, substantially as described.

5. In a machine for rolling metal articles to form, the combination of two plane-faced rotary die-supporting platens, as A B, a two-part forming-die mounted, one member on the plane face of one and the other member on the opposing plane face of the other platen, and means for rotating the platens progressively, to bring the co-operating die members up to and past each other repeatedly, and an adjustable gage for supporting the metallic rod operated upon between the dies, substantially as described.

6. In a machine for rolling metal articles to form, the pivotally-supported die-platens A B and dies mounted on the faces thereof, combined with the supporting rolls 25, arranged to bear upon the platens, and means for rotating the platens, substantially as set forth.

7. In a machine for rolling metal articles to form, the die-supporting platens A B, the dies *a a*, mounted on the faces thereof, the gears 8 11, engaging the platens, as described, the supporting-rolls 25, shafts 7 12, and connecting and operating mechanisms, in combination, substantially as set forth.

8. In a machine for rolling metal articles to form and in combination, substantially as set forth, the standard F, the bracket-arm E, supported movably on said standard, and the die-supporting platens and operating mechanisms, substantially as described.

Signed at Boston, Massachusetts, this 6th day of December, A. D. 1887.

CHARLES F. TEBBETTS.

Witnesses:

H. O. STRATTON,

C. B. TUTTLE.