

(No Model.)

H. B. SARGENT & B. C. STEVENS.
MACHINE FOR ROLLING METAL.

No. 441,902.

Patented Dec. 2, 1890.

Fig. 1

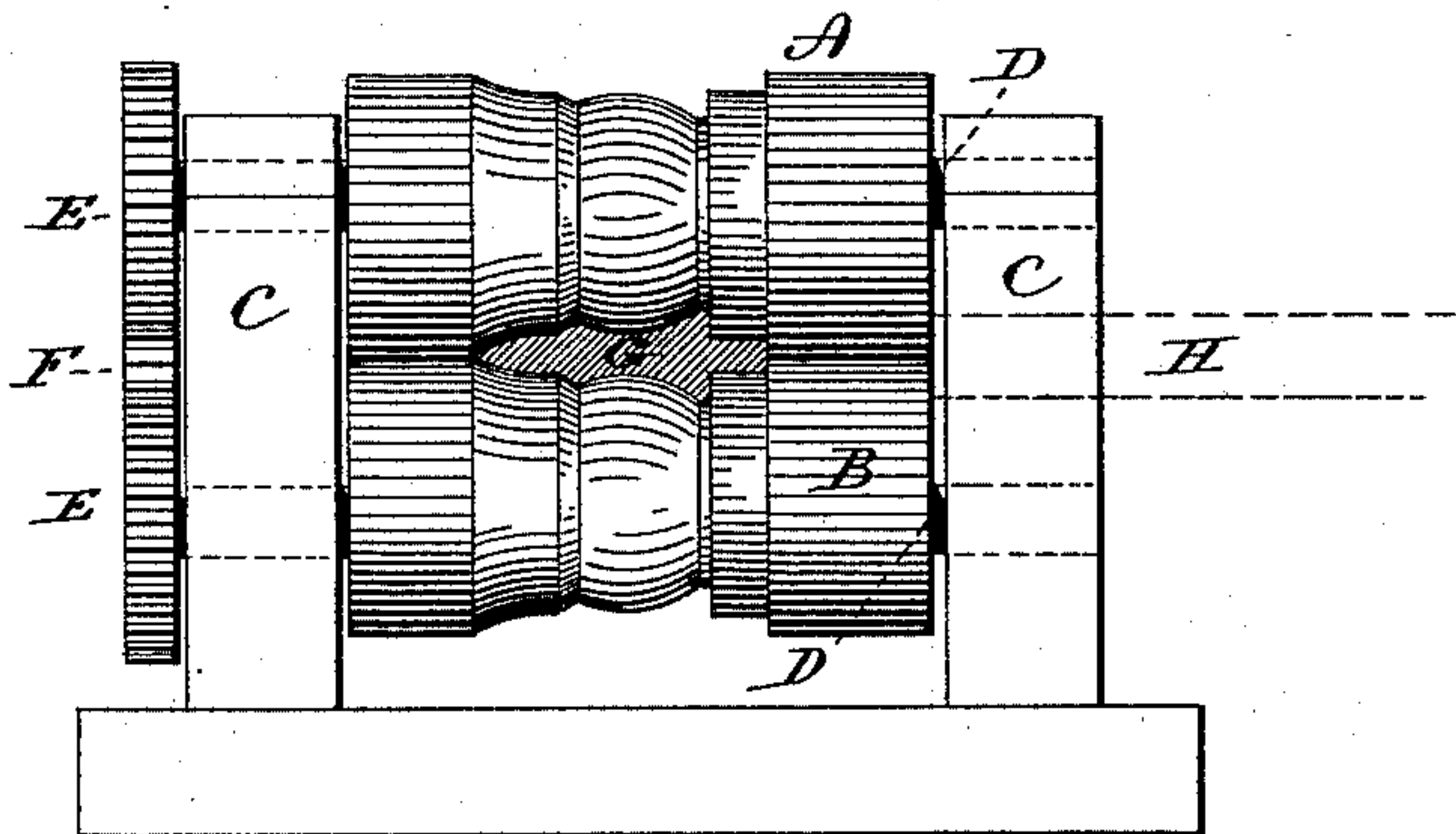


Fig. 2

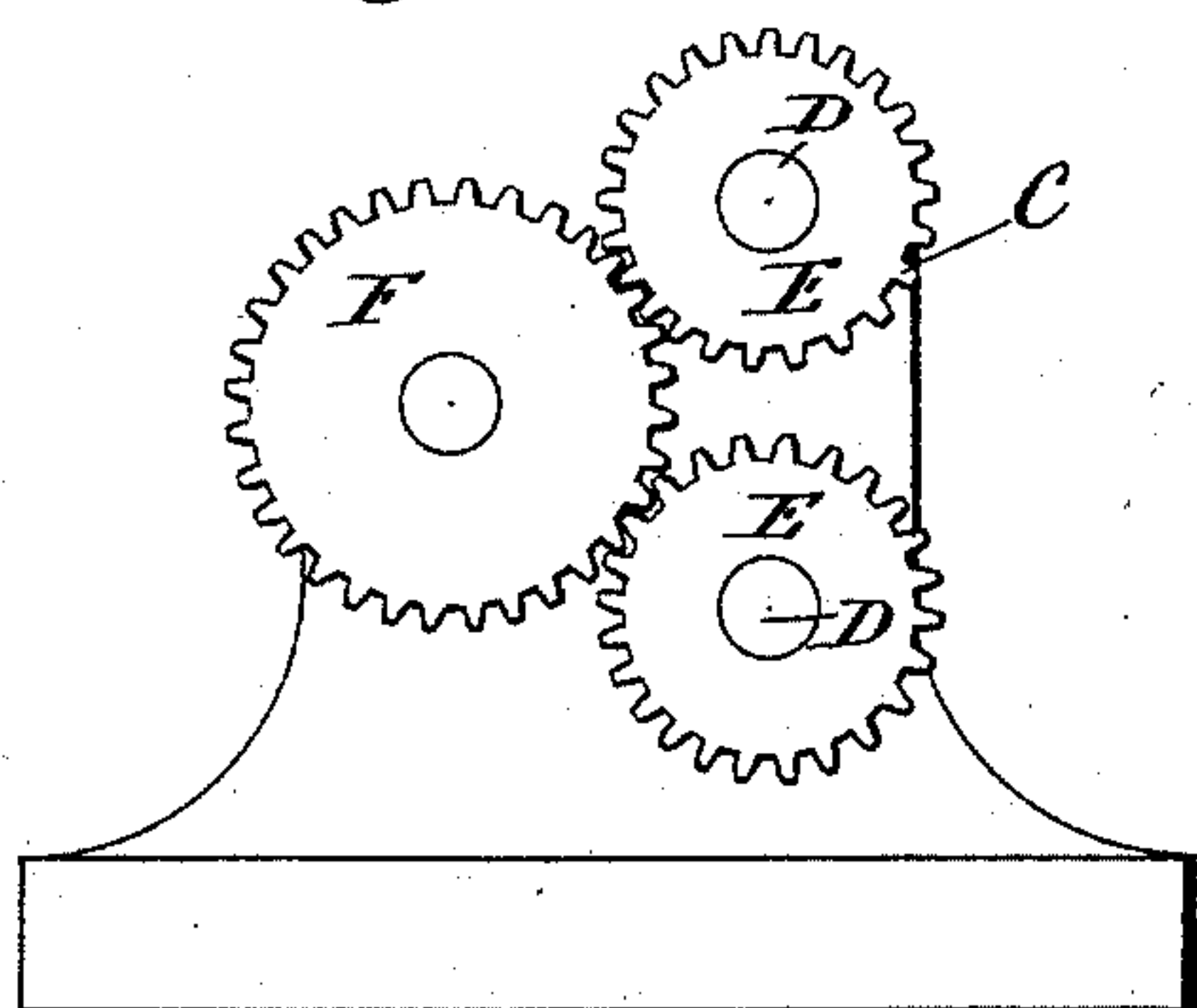


Fig. 3

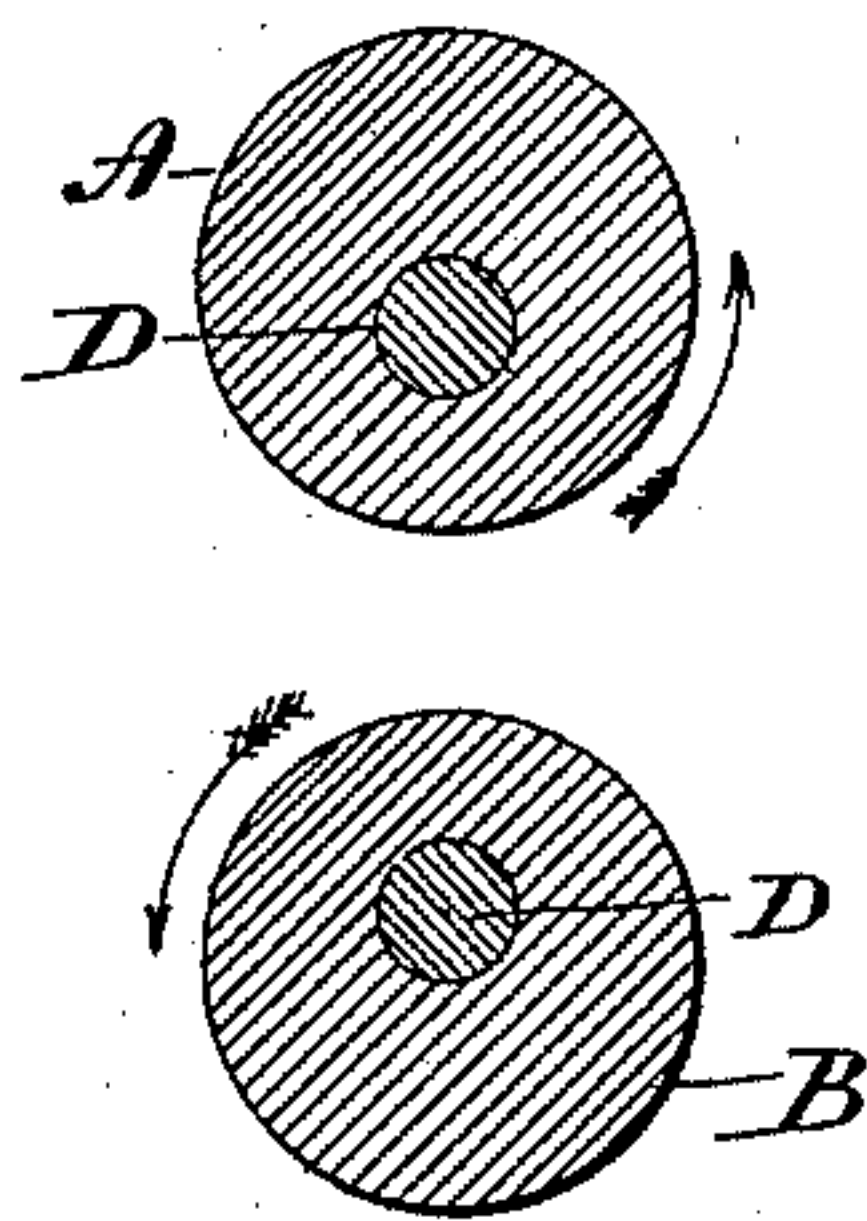
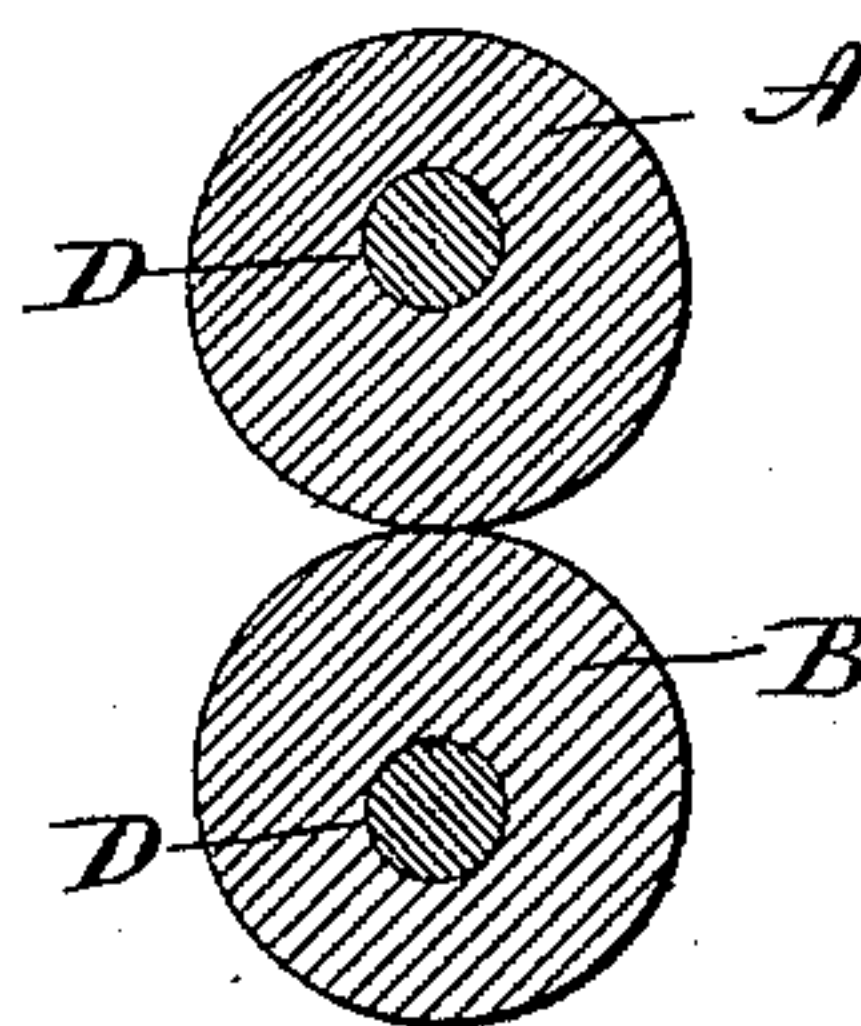


Fig. 4



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HENRY B. SARGENT AND BENJAMIN C. STEVENS, OF NEW HAVEN, CONNECTICUT, ASSIGNORS TO SARGENT & COMPANY, OF SAME PLACE.

MACHINE FOR ROLLING METAL.

SPECIFICATION forming part of Letters Patent No. 441,902, dated December 2, 1890.

Application filed April 4, 1890. Serial No. 346,541. (No model.)

To all whom it may concern:

Be it known that we, HENRY B. SARGENT and BENJAMIN C. STEVENS, of New Haven, in the county of New Haven and State of Connecticut, have invented new Improvements in Machines for Rolling Metal; and we do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of a machine of simple construction, illustrating the invention; Fig. 2, a side view of the same; Fig. 3, a transverse section through the rolls, representing them in their wide-open position; Fig. 4, the same as Fig. 3, but representing the rolls in their nearest approach to each other.

This invention relates to an improvement in machines for shaping articles which are round in transverse section, the object being to readily produce such articles by means of a pair of rolls having annular grooves in their surfaces, so as to form a space between the rolls in shape longitudinally corresponding to a longitudinal section of the article to be produced; and the invention consists in a pair of rolls having in their periphery annular grooves in longitudinal section corresponding to the longitudinal section of the article to be produced, and so that the space in the grooves between the rolls will correspond to the longitudinal section of the article to be produced, said rolls arranged upon axes eccentric to their periphery, and so that in revolving the rolls will in one position stand at a distance apart corresponding to the combined eccentricity of the two rolls, and from that point in revolving their peripheries will approach each other until the nearest possible point is attained, and then will gradually recede until the first or open position is again reached, the rolls being geared together so as to revolve in the same direction—that is, so that their adjacent surfaces will travel in opposite directions, and so that the metal placed between the rolls and into the said grooves will be caused to revolve by the revolving rolls, and in so revolving will stand in the grooves parallel with the axes of the rolls,

and by the gradual approach of the rolls will be caused to assume the shape of the space between the two rolls when the rolls are at their nearest approach, and as more fully hereinafter described.

A B represent the pair of cylindrical rolls. They are arranged in suitable bearings C in like manner as rolls employed for reducing metals, except that the axes D of the rolls are eccentric to the periphery of the rolls; and, as seen in Fig. 3, the eccentricity of the axes being equal to the reduction of the space required to be produced between the rolls.

The arbors of the rolls are provided with gears E E, and are connected by an intermediate gear F, so that the rolls will travel in the same direction of rotation—that is, so that the adjacent surfaces of the rolls will move in opposite directions, and as indicated by arrows in Fig. 3. The peripheries of the rolls are constructed with like annular grooves, the shape of the grooves corresponding to the article to be produced, and so that the space between the rolls when at their nearest approach will correspond to the shape of the article to be produced, and as seen in Fig. 1, G representing the article between the rolls.

Power is applied to drive the rolls in the usual manner of driving other rolls for reducing metals. Because of the eccentricity of the axes of revolution of the rolls to the rolls themselves, it will be seen that at one point in their revolution the adjacent surfaces of the rolls are distant from each other according to the eccentricity of the rolls, as seen in Fig. 3. Then that in one-half revolution of the rolls the opposite position will be attained and the rolls brought to their nearest approach to each other, as seen in Figs. 1 and 4. Consequently the peripheries of the rolls from the wide-open position will gradually approach each other until the nearest position is reached, as seen in Fig. 4. Then the continued revolution of the rolls will cause them to gradually open until the wide-open position is again attained.

In operation the blank to be wrought is placed between the rolls when in their wide-open position, and so that its axis may be substantially parallel with the axes of the rolls. The rolls now caused to revolve will

gradually approach each other, and, bearing upon the blank between them at diametrically-opposite points and the surface of the rolls traveling in opposite directions, will cause that blank to rotate between the rolls and assume a corresponding round shape in transverse section, the diameter of the blank gradually reducing until the nearest approach of the rolls is attained. In this operation of rolling, the blank gradually assumes a shape corresponding to the grooves in the rolls until when the operation is complete the blank substantially fills the space between the two rolls and will be perfectly round in transverse section, and after this shape is attained the rolls, continuing their revolution, will permit the escape of the rolled article and open the space for the introduction of a second blank, and so continuing successive blanks will be thus wrought into the required shape.

The formation of the grooves will be varied according to the article to be produced, the illustration in Fig. 1 being sufficient to enable others skilled in the art to shape the grooves accordingly. In the illustration, Fig. 1, the surfaces of the rolls outside the grooves are represented as coming together, so that the length of the article corresponds to the width of the grooves. In cases where it is desirable to form the articles from the end of a rod, so that successive articles may be produced from the rod, the rod may be introduced at one side between the rolls when wide open, as indicated in Fig. 1, H representing such a rod; or if it be desired to form the article on the end and as a part of the rod—that is, so that the article may form, as it were, a tip upon the rod—the rod will be introduced in like manner from one side, the rolls being constructed accordingly.

We do not wish to be understood as claiming broadly constructing rolls with annular grooves longitudinally corresponding to the

outline of the article to be produced and so that the space between the rolls may conform to the longitudinal sectional shape of the article to be produced and giving to the rolls revolution in the same direction, so that their adjacent surfaces may travel in opposite directions, and thereby cause the blank to be wrought, to revolve between the rolls, as such we are aware, broadly considered, is not new, the essential feature of our invention being the arrangement of the rolls upon axes eccentric to their periphery, whereby the surface of said rolls in their revolution are caused to approach and recede from each other to contract and open the space between the rolls, so that a blank placed between the rolls is caused to revolve, and by such eccentric approach of the two rolls will be reduced to a shape longitudinally corresponding to the grooves in the rolls, while in transverse section the blank will be brought to circular shape.

We claim—

In a machine for rolling metal, the combination of a pair of cylindrical rolls arranged upon arbors eccentric to the periphery of said rolls, geared together so that their adjacent surfaces run in opposite directions, and the said surfaces, because of said eccentricity of the axes, gradually approaching and receding from each other, the periphery of said rolls constructed with like annular grooves, the said grooves combined producing a space between the two rolls at their nearest approach corresponding longitudinally to the longitudinal section of the article to be produced, substantially as described.

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