

No. 731,769.

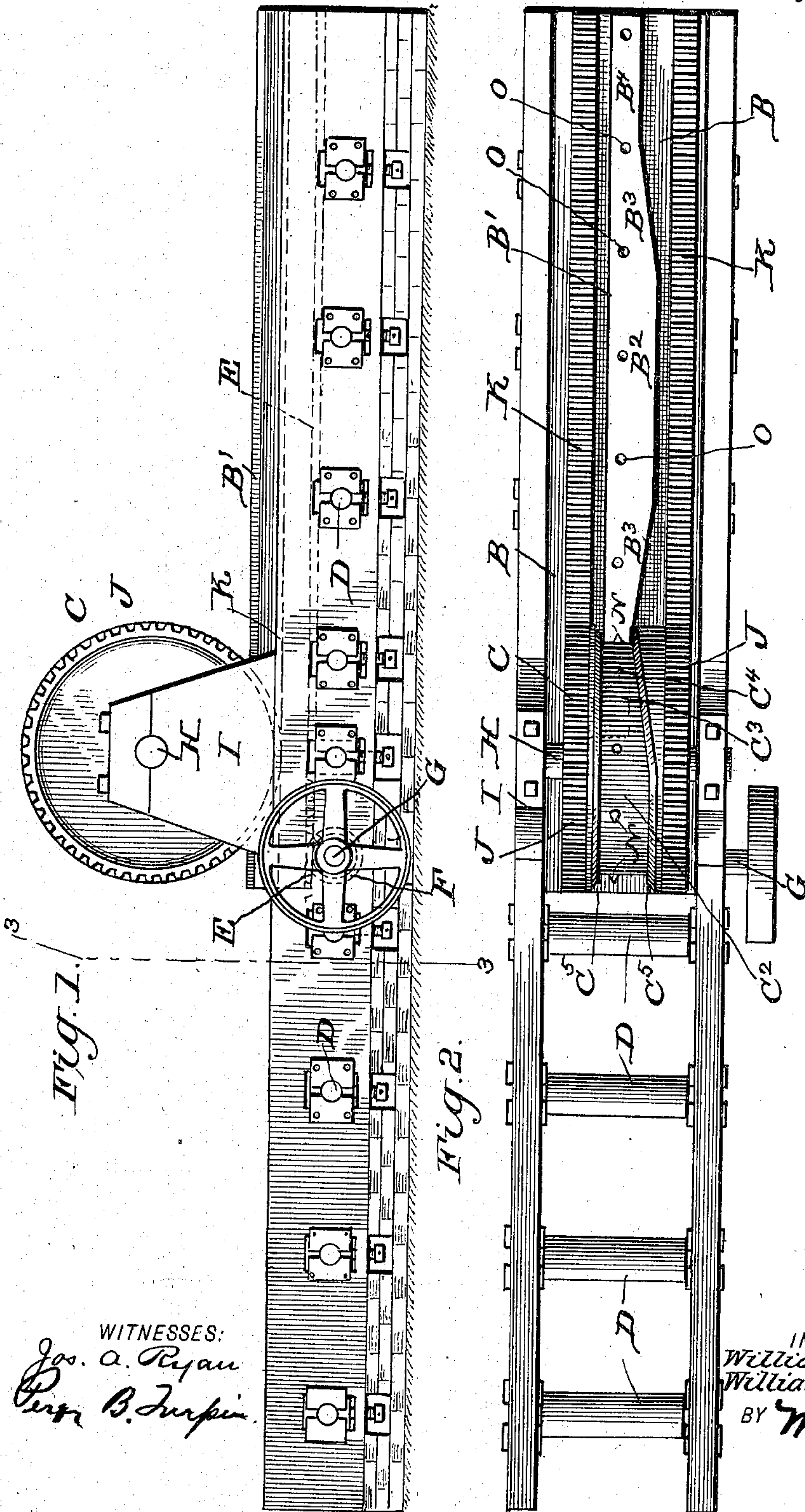
PATENTED JUNE 23, 1903.

W. S. GILLEN & W. G. ANDERSON.
ROLLING PRESS.

APPLICATION FILED JULY 28, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:
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INVENTORS:
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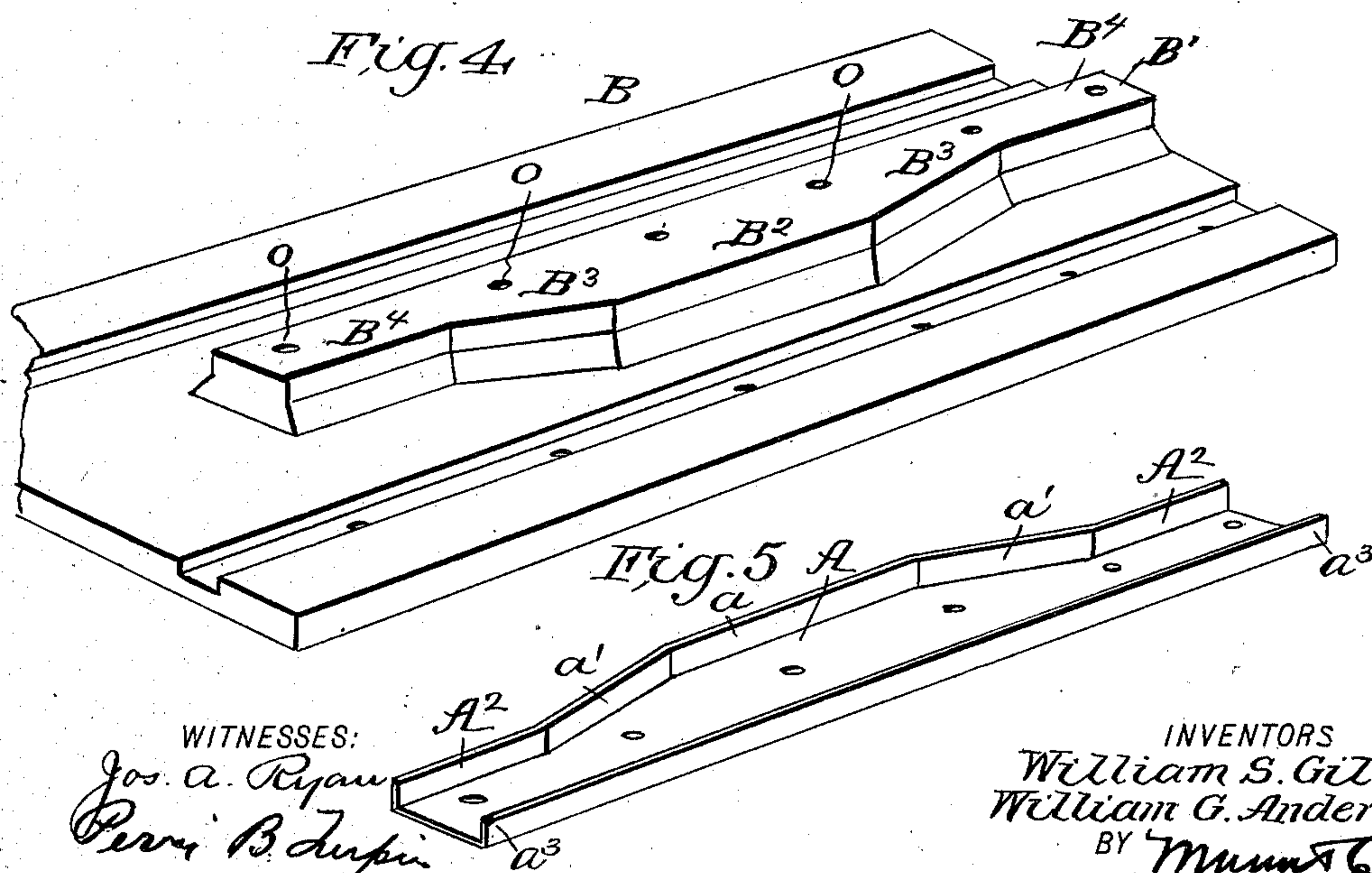
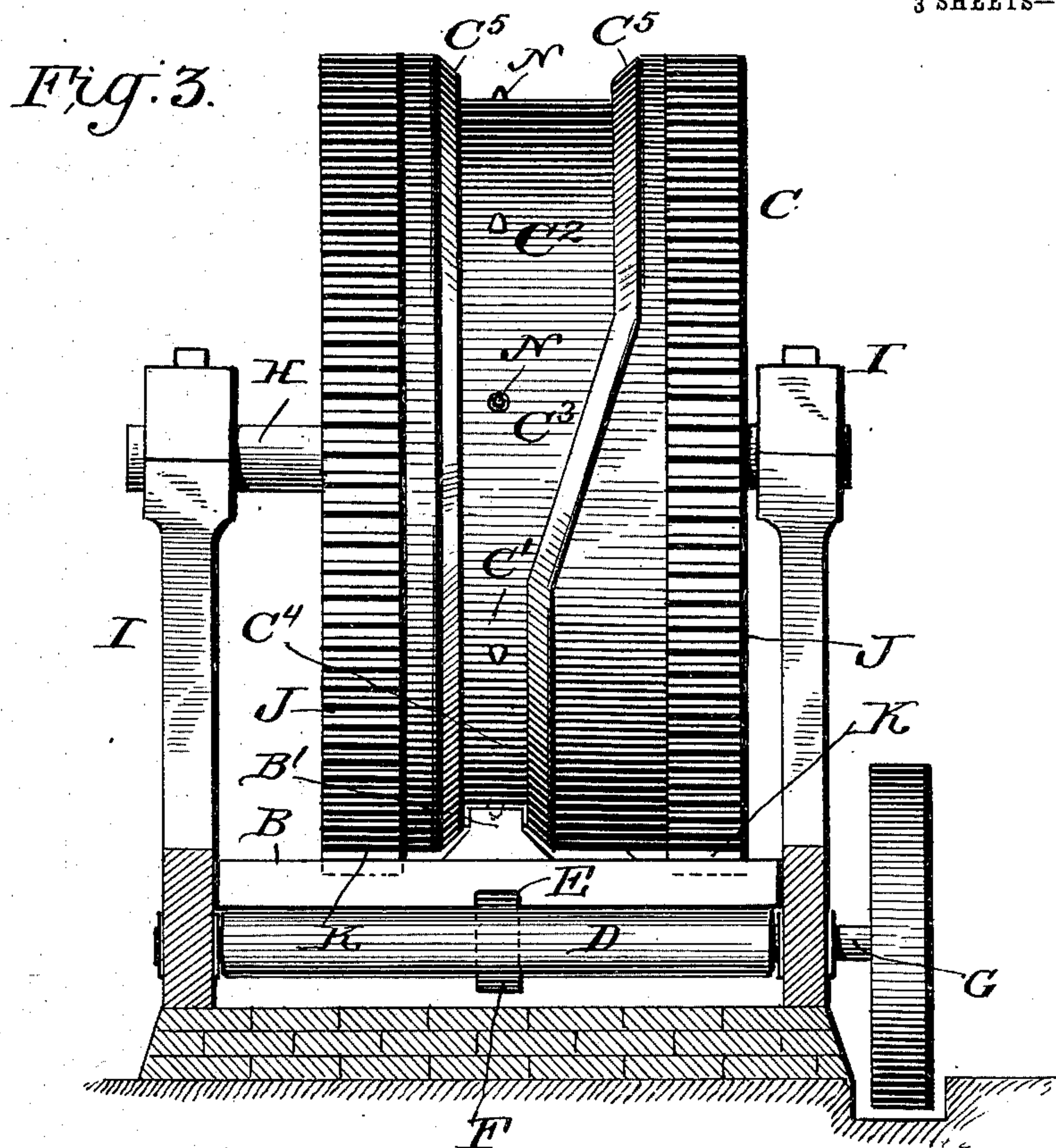
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 6

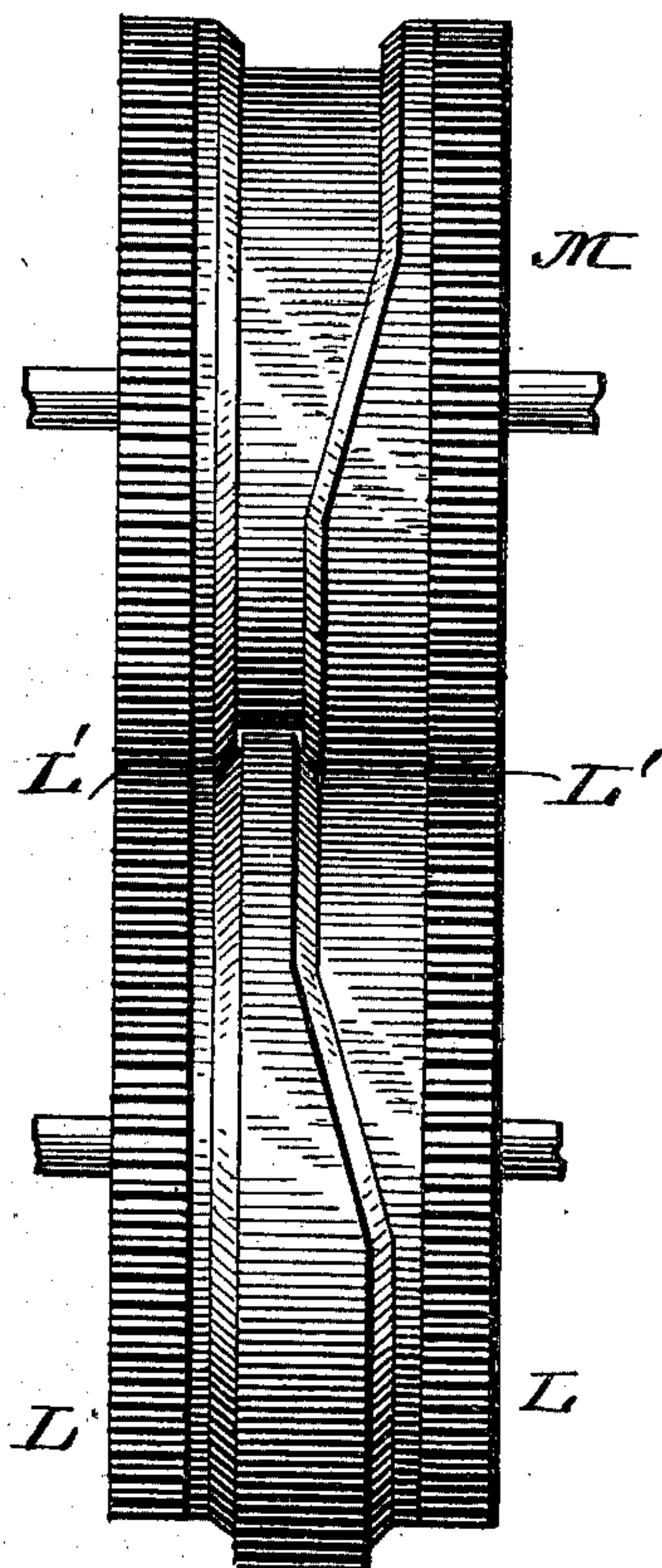
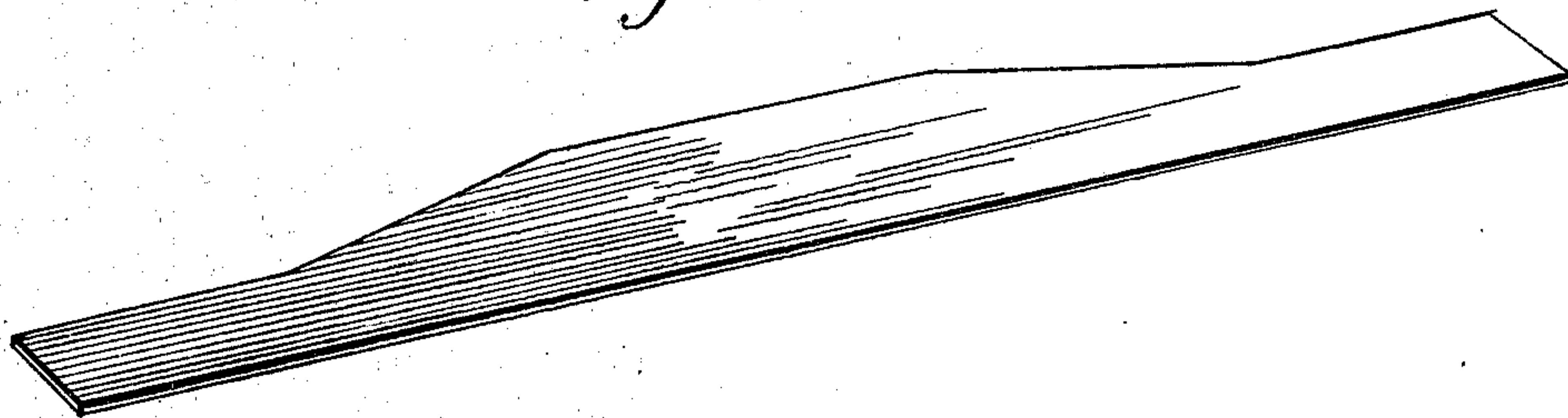


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ROLLING-PRESS.

SPECIFICATION forming part of Letters Patent No. 731,769, dated June 23, 1903.

Application filed July 28, 1902. Serial No. 117,326. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM S. GILLEN, of Allegheny, and WILLIAM G. ANDERSON, of Emsworth, in the county of Allegheny and State of Pennsylvania, have made certain new and useful Improvements in Rolling-Presses, of which the following is a specification.

Our invention relates to means for manufacturing metal beams, sills, bolsters, and similar structures, and particularly to the manufacture of such of those articles referred to as vary in width and which are provided with longitudinal side flanges. Heretofore means for this purpose have been very cumbersome and expensive in construction and slow and tedious in operation.

The objects of our invention are to simplify such means, to produce a better article, and to greatly reduce the time and expense ordinarily expended in such operations.

To these ends the present invention consists generally of a new and improved roller-press or flanging-machine, of new forms and arrangement of a roller-die and slide-die, and in the construction, arrangement, and combination of parts of the mechanisms referred to, all as hereinafter fully described and claimed.

In the accompanying drawings, which illustrate forms and applications of our invention, Figure 1 is a view in side elevation of our roller-press; Fig. 2, a plan view; Fig. 3, an end elevation, partly in section, taken on about line 3-3 of Fig. 1; Fig. 4, a perspective view of a slide-die; Fig. 5, a perspective representing a finished product; Fig. 6, an end view of a detail consisting of a modified form of dies, and Fig. 7 a perspective view of blank from which the finished product is formed.

In the drawings we have shown an apparatus particularly adapted for making side sills or beams used in the construction of railway-cars, and our description is restricted to such apparatus and articles; but it should be understood that our invention is not limited to the manufacture of such products alone, as it comprises means for forming a flange or

flanges on a piece or sheet of metal of varying width or having an irregular outline.

A preferred form of metal side sills or beams used in steel-car construction is usually about forty feet in length and is similar to the form shown by Fig. 5 of the drawings. These sills are formed of a single piece of metal and have a central swelled or bellied portion, tapering end portions, and longitudinal side flanges formed on opposite sides, one flange following the straight edge or side and the other flange the irregular outline of the opposite edge or side. As illustrated, A represents the swelled or bellied portion of the sill, and a^3 a flange following the straight side or edge. For the purpose of calling attention to the irregular flanged outline of one side or edge of the sill we have in the drawings somewhat exaggerated the lines of departure from one irregular flanged portion to another and have designated those portions by the letters a , a' , and A^2 . In the finished article as made by us the angle effect shown in Fig. 5 is not produced, for the portions a , a' , and A^2 gradually merge one into another and form a continuous curved flange on the irregular side or edge. As shown, central flange a , as well as end flanges A^2 , are substantially parallel with the straight side or edge of the sill and its flange a^3 . The central flange a being connected with end flanges A^2 by intermediate flanges a' produces a continuous flange following the irregular contour of the irregular side or edge of the sill. In some instances it may be desirable to form the sills with swelled flanged portions on both sides thereof, in which case it would only be necessary to modify the die-surfaces accordingly without departing from our invention.

In the construction shown in Figs. 1, 2, and 3 we employ a sliding die-section B and a rolling die-section C, the latter operating after the manner of a former and may for such reason be termed a "rolling former." The two die-sections are mounted on a suitable frame, the section B resting upon rolls D and being provided on its under side with a rack E, meshed by a pinion F on a shaft G, which may be given motion in any suitable manner.

By the described construction the slide-plate B may be moved back and forth beneath the rolling former C. This rolling former C has its shaft H journaled in suitable supports I on the frame and is provided with a gear-ring J, meshing with a rack K on the slide-plate, so the two parts may move in unison. As shown, the slide-plate is reciprocated, and thereby imparts motion to the rolling former. Manifestly, however, the rolling former may be turned to operate the slide-plate without departing from any of the principles of our invention. As shown, we provide the slide-plate with the toothed racks E at both edges and the former C with the gear-rings J at both sides to mesh with the said racks, this being preferred, because it avoids any twisting strain upon the machine; but it is obvious that one of the racks and rings might be omitted, if desired. In the operation of this construction the plate is reciprocated beneath the rolling former. It may be desired, however, to arrange both the die-sections to revolve, as shown in Fig. 6, wherein the male die-section L is geared at L' with the female die M, the die-surfaces being formed substantially in accordance with the construction shown in Figs. 3 and 4 and which we will now describe.

As shown in Figs. 3 and 4, and as preferred, the slide B is the male die-section and the rolling former C is the female die-section. To this end the section B is provided with die-surface B', which is provided at its middle with the laterally-projecting portion B² and has the inclined edges B³, uniting said laterally-projecting portion with the end portions B⁴ of the die-surface B'. This die-surface B' is of a length equal to or exceeding the length of the stringer to be produced and coöperates with the rolling former C to press a flat blank plate by a rolling action into the form shown in Fig. 5. For some purposes it is preferable to form the die-surface B' slightly convex or rounded instead of having a plain flat surface. The rolling former C, as shown, has its die-surface provided with an irregular-shaped groove C' of varying width, the widest portion C² of which corresponds to the laterally-projecting portion B² of the surface B' of the other die. It is further provided with a narrow portion C⁴, which portion is connected with the widest portion C² by intermediate portions C³. Portion C⁴ and portions C³ respectively correspond with the portions B⁴ and B³ of the die-surface B'. The outer edges of the walls of the groove C' are beveled, as shown by C⁵, for the purpose of gradually bending and forcing the edges of the metal plate down upon the other die. Groove C' may be made of varying depth to coöperate with the convex or curved die-surface B' of the other die when it is desirable to have said latter surface of this form.

While we have shown the roller-former C in the form of a complete circle, it is obvious our invention is not limited to this form—

that is to say, the roller-former may be made in the form of a sector or other curved body suitable for performing the work, and it is to be understood that the term "roller-die" embraces the forms referred to.

The two die-sections are so geared together or otherwise so connected that their dies will be in complementary correlation—that is, so that the wide and narrow parts of the male die will fit into the corresponding wide and narrow parts of the female die and will thus always be in such relative position as to engage the beam and to follow exactly throughout the contour of the sill or beam, which is placed, preferably, upon the male die.

If desirable to punch holes through the sill for rivets, bolts, and the like, the roller-former may be provided with punches N and the surface B' with sockets O to receive said punches, thus enabling the sheet or piece of metal to be both flanged and punched at a single operation.

Attention is called to the fact that we provide a roller-former whose die-surface is adapted to operate upon a sheet or piece of varying width and which in conjunction with another die is capable of forming flanges on the said irregular piece of metal. We are thus enabled to produce at a single continuous operation of the machine a sill or beam having a central swelled portion, a flanged straight side or edge, and a flanged irregular side or edge.

While we have confined the illustration of our invention to the manufacture of sills or beams having what might be termed "lateral" offsets, our invention is not limited to the manufacture of such structures, but includes means for forming a flange or flanges on the side edges of a piece or sheet of metal of varying width. Our invention further contemplates the formation of flanges on both of the longitudinal sides or edges of the metal or upon the irregular side or edge only.

Manifestly the invention will be useful and applicable to structural and naval architectural work as well as for car-building, and it may be desirable in some instances to provide lateral projections on both sides of a beam, so as to make a double arch, as it were, and this may be accomplished by duplicating the lateral projections on the die-sections in order to provide for pressing the flange on the lateral projections of both sides of a beam or plate, as will be understood from the drawings and preceding description.

By altering the size of the die-surfaces we will of course be able to produce sills, beams, &c., of any desired dimensions, and such changes will come within the scope of our invention.

What we claim is—

1. A machine for flanging a metal body of varying width consisting of an edge-bending roller-die having a die-face of varying outline conforming to the shape of the body, and a coöperating die, substantially as described.

2. A machine for flanging a metal body of varying width consisting of a roller-die and a cooperating die having correspondingly-varied die-faces and arranged in complementary correlation whereby the metal of the body is bent along the edge to form a flange, substantially as described.

3. A machine for flanging a metal body of varying width, a roller-die, a cooperating die, a groove of irregular outline in one of said dies and an irregular projection on the other die adapted to enter said groove and said groove and projection corresponding in outline to said body, whereby the metal of the body is bent along the edge to form a flange substantially as described.

4. A mechanism for flanging bodies consisting of a roller, a sliding carriage, a male die and an interfitting female die oppositely carried by said roller and carriage, and means for actuating said roller and carriage whereby the metal of the body is bent along the edge to form a flange, substantially as described.

5. A machine for flanging a metal body of varying width consisting of a roller and a cooperating bed geared together and provided with an interfitting groove and raised portion of outline conforming to that of the said body and means for actuating said roller and cooperating bed, substantially as described.

6. A machine for flanging a body of varying width consisting of a roller provided with a groove of varying width and corresponding to the outline of the body, a sliding plate having a raised portion of varying width and corresponding to the outline of the body and adapted to interfit with said groove, gears connecting said roller and plate in complementary correlation, and means to drive said gears, substantially as described.

7. The combination in a roller-press for flanging metal, of the rolling former having a die-surface provided with a laterally-widened portion and a slide-plate cooperating with the

rolling former and having a die-surface provided with a laterally-projecting portion conforming to the widened portion of the rolling former, substantially as described.

8. The improved rolling-press for flanging metal substantially as herein described consisting of the framing, the slide-plate having a male die-section provided with the die-surface having a laterally-projecting portion and the rolling former geared with the slide-plate and having a grooved die-surface provided with a laterally-widened portion corresponding to that of the slide-plate and having at the outer edges of said groove outwardly-flaring surfaces, whereby to gradually bend the portion of the metal to be flanged to the finishing die-surface, substantially as described.

9. The combination in a rolling-press of the framing, the slide-plate having a die-surface and provided on opposite sides thereof with toothed racks, and the rolling former having the die-surface conforming to that of the slide-plate and provided on opposite sides of said die-surface with the gear-rings meshing with the racks of the slide-plate, substantially as described.

10. A roller-press comprising the slide-plate having the upwardly-projecting die-surface provided with the laterally-projecting portion, and the rolling former geared with the slide-plate and having the circumferential groove forming the die-surface and having the laterally-widened portion corresponding to that of the slide-plate and provided at the outer edges of said groove with the outwardly flared or tapered surfaces, all substantially as and for the purpose set forth.

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Witnesses:

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