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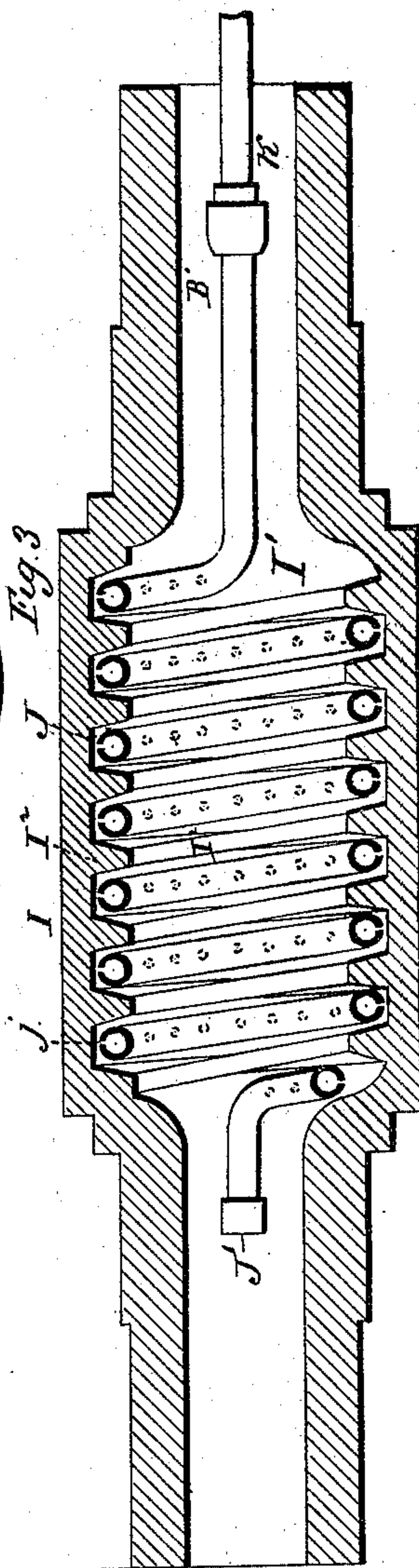
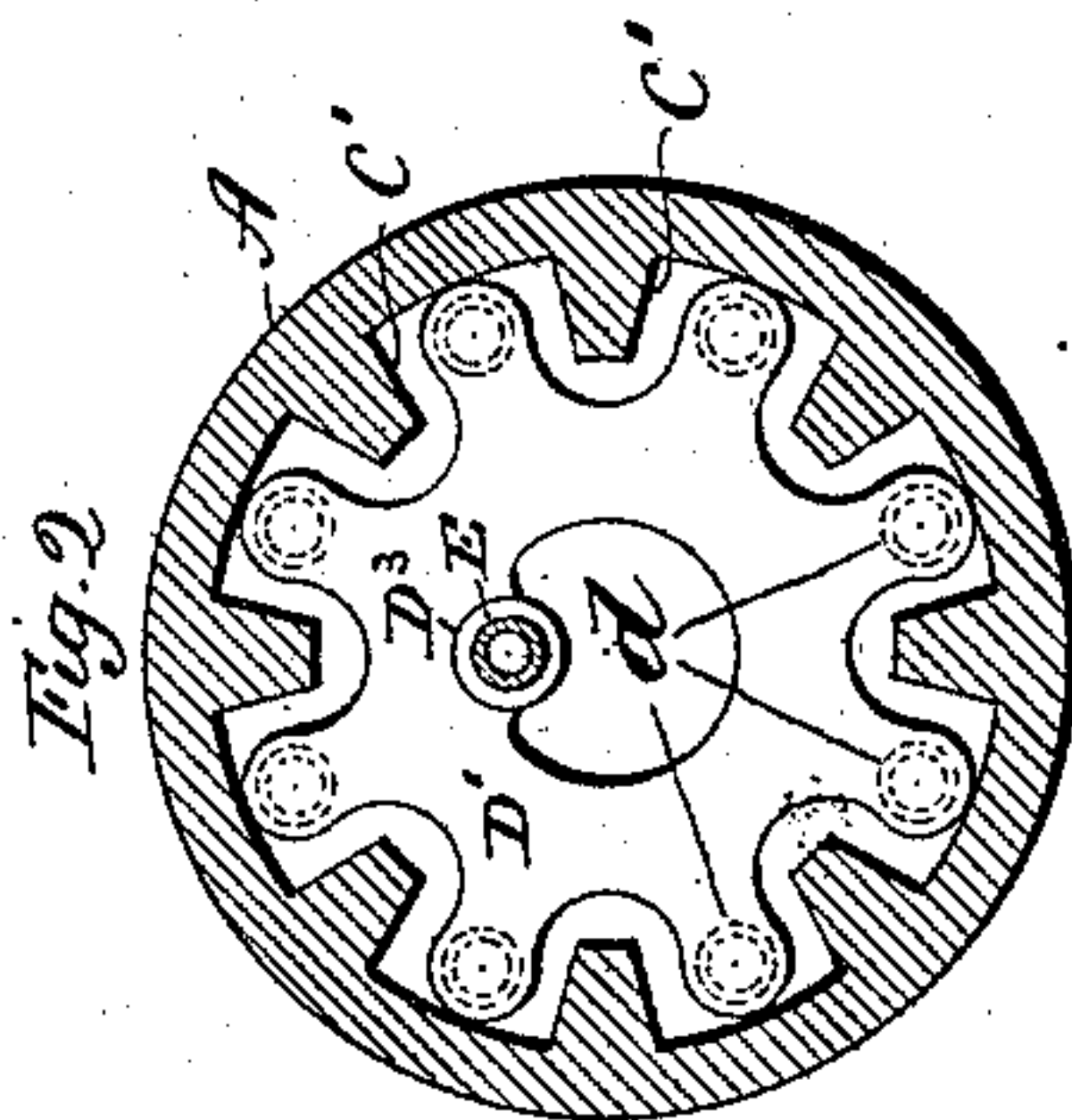
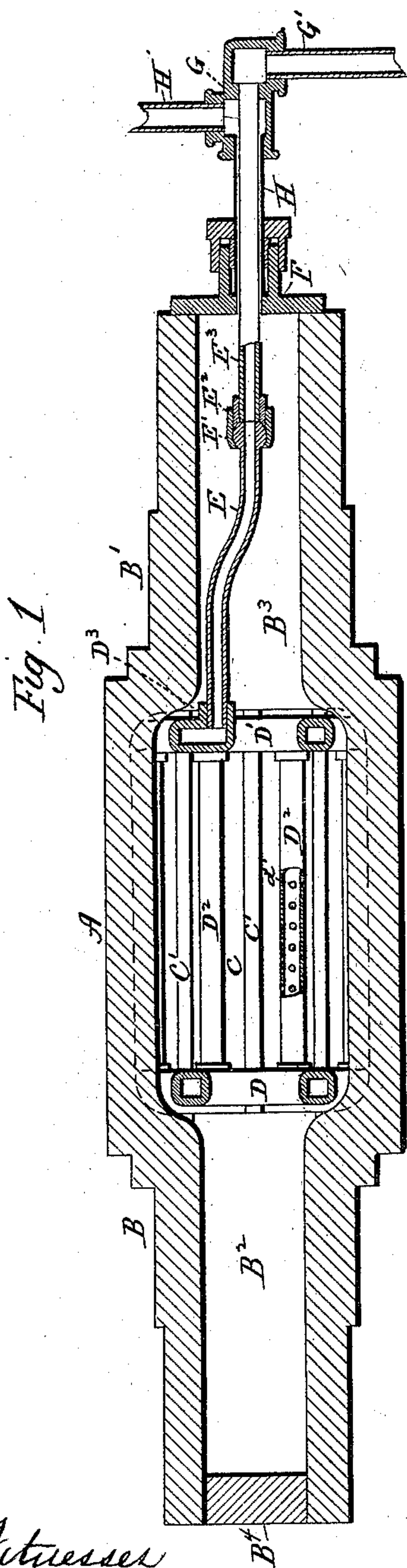
2 Sheets—Sheet 1.

F. H. BREWSTER.

ROLL FOR MACHINES FOR WORKING RUBBER.

No. 533,268.

Patented Jan. 29, 1895.



Witnesses.
J. H. Shumway
Lillian D. Kelsey

Frank H. Brewster,
Inventor.
By attys Earl Reynon

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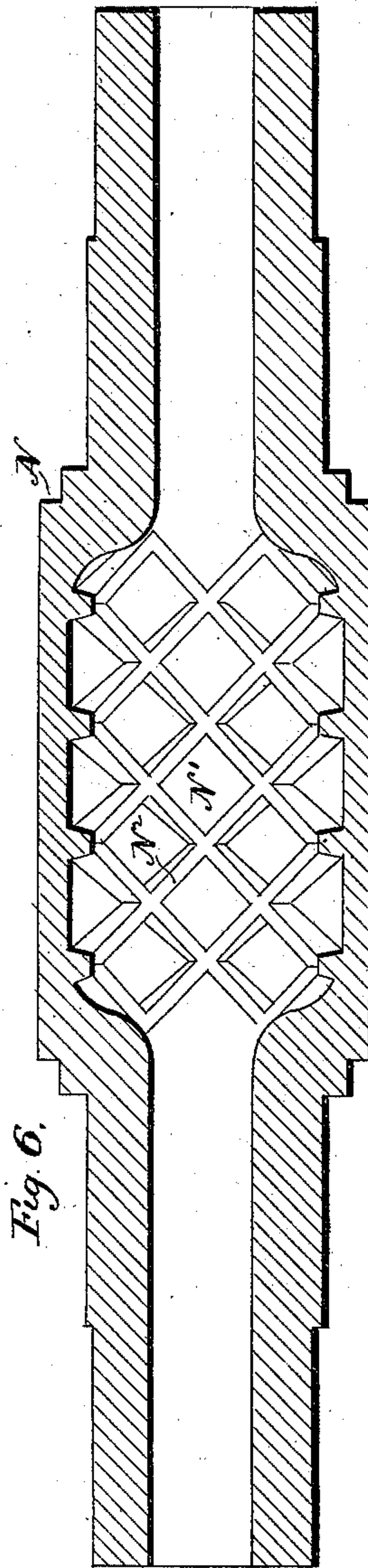
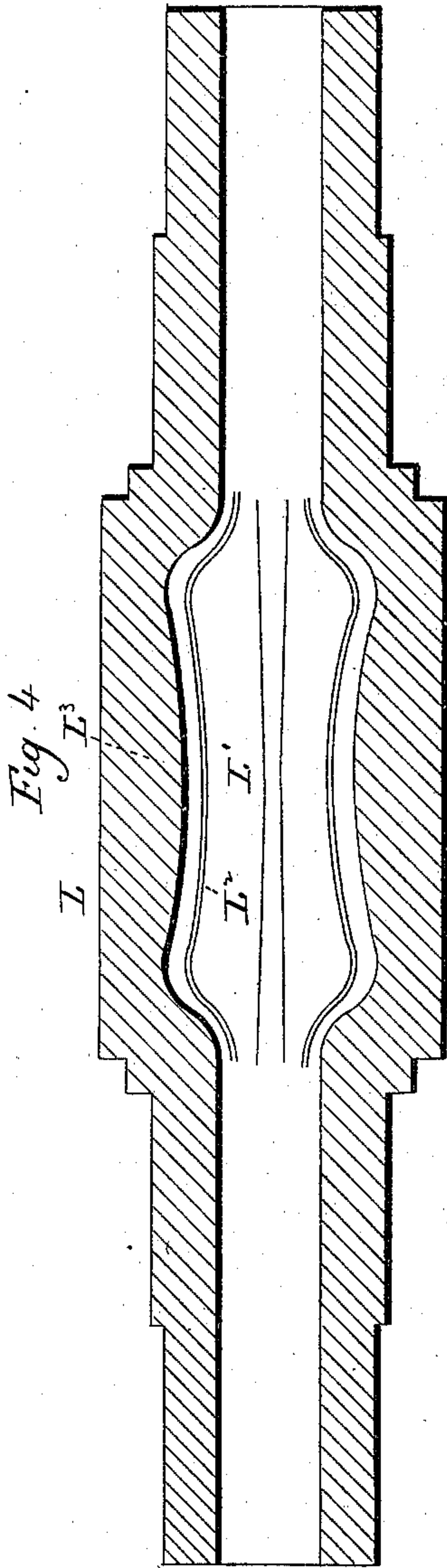
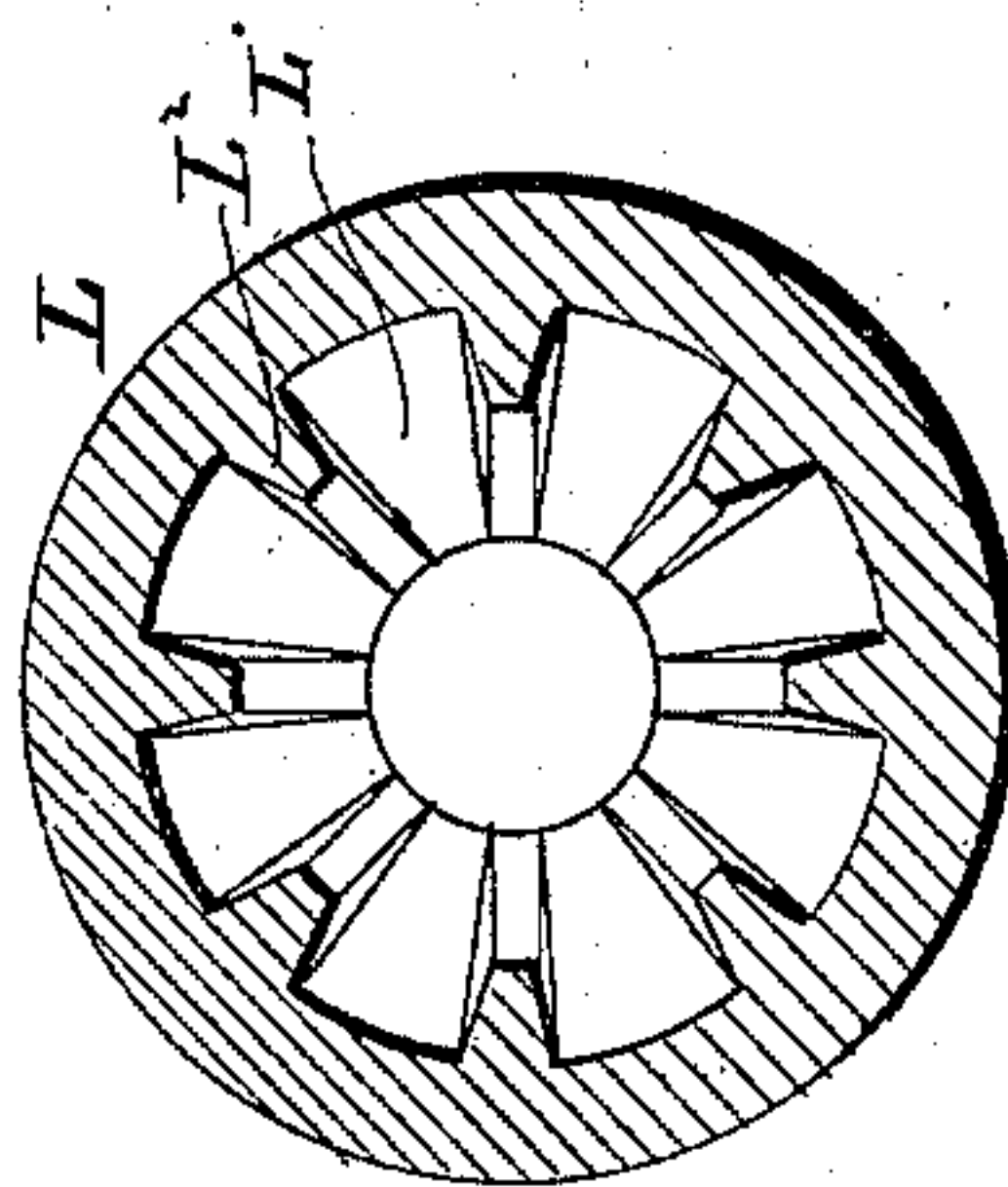


Fig. 5



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By Atty. Earl Seymour

UNITED STATES PATENT OFFICE.

FRANK H. BREWSTER, OF DERBY, CONNECTICUT, ASSIGNOR TO THE
BIRMINGHAM IRON FOUNDRY, OF SAME PLACE.

ROLL FOR MACHINES FOR WORKING RUBBER.

SPECIFICATION forming part of Letters Patent No. 533,268, dated January 29, 1895.

Application filed October 8, 1894. Serial No. 525,225. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. BREWSTER, of Derby, in the county of New Haven and State of Connecticut, have invented a new Improvement in Rolls for Machines for Working Rubber, &c.; and I do hereby declare the following, when taken in connection with the 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 view in central longitudinal section of one form which a roll constructed in accordance with my invention may assume; Fig. 2, a view of the roll in transverse section; Fig. 3, a view in central longitudinal section of another form which my improved roll may assume; Fig. 4, a corresponding view of still another form of roll; Fig. 5, a view in transverse section of the roll shown in the preceding figure; Fig. 6, a view in central longitudinal section of still another form which the roll may take.

My invention relates to rolls for machines for working rubber, gutta-percha, paper, cloth, and other kindred substances, and is particularly designed for the production of rolls for the washing, grinding and calendering machines used in the working of rubber, the object being to provide such machines with rolls adapted to resist crushing and torsional strains, and constructed with particular reference to being kept at a uniform temperature, whether hot or cold.

With these ends in view, my invention consists in a roll provided at its ends with trunnions, and constructed with an internally ribbed chamber, which extends nearly to its ends.

My invention further consists in a roll having certain details of construction as will be hereinafter described, and pointed out in the claims.

In carrying out my invention, my improved roll may be constructed in a variety of ways, depending upon the character of the machine in which it is to be employed, and upon the character of the means employed to control its temperature.

As shown in Figs. 1 and 2 of the drawings,

the roll A has a smooth periphery, integrally formed trunnions B B' containing central longitudinal passages B², B³, and a large interior chamber C, extending nearly to the ends of the roll, and contracted at its ends to intersect the inner ends of the said passages B² B³, and containing a series of inwardly projecting, radially arranged longitudinal ribs C', which converge and taper at their ends in accordance with the contraction of the ends of the chamber.

I will here explain that the roll will be constructed so that the metal of the roll at the points between the ribs, will be as thin as consistent with sound casting, and the strength required to resist both crushing and torsional strains. It is clear of course, that the thinner the metal is between the ribs, the more responsive the roll will be to the action of the cooling or heating medium, whatever that may be. The ribs themselves stiffen the roll as to crushing and torsional strains, but particularly the latter, for it is to be understood that in machines of this class both rolls are generally operated by power applied to one end, so that the torsional strain upon the rolls is very considerable.

As shown in the said Figs. 1 and 2 of the drawings, the means employed for maintaining the roll at a uniform temperature, whether that be hot or cold, comprise two hollow headers D D', united by straight pipes D², the opposite ends of which are entered into the headers, which, with the pipes, form what I may term a cage, substantially corresponding in length to the length of the chamber C, and in diameter to the internal diameter thereof. By reference to Fig. 2 of the drawings, it will be observed that each of the headers is provided with a series of radial arms, adapted to extend into the spaces between the ribs, of which there are as many as there are arms. It will also be observed by reference to the same figure, that the inner faces of the outer ends of the arms are adapted by their provision with bosses d shown by broken lines in Fig. 2, to receive the pipes D², the outer peripheries of which are constructed with numerous perforations d', through which water or steam is jetted against the inner periphery of the roll at points between the ribs. The

header D is closed, except for the openings formed in the said bosses d to receive the adjacent ends of the pipes D^2 , but the header D' is provided upon its outer face with a boss D^3 , for the attachment of the inner end of the revolving inner section E of the feed pipe, the outer end of which is furnished with the ball E' of a universal joint, the socket E^2 of which is located upon the inner end of the stationary outer section E^3 of the feed-pipe, the outer end of which section extends outward through a stuffing-box F, applied to the end of the trunnion B' , through which it passes. The projecting outer end of the stationary section E^3 of the feed-pipe enters a goose-neck G, into which an inlet pipe G' enters, the said inlet pipe being provided for the introduction of the cooling or heating medium, whatever that be. An exhaust pipe H, larger in internal diameter than the external diameter of the stationary section E^3 of the feed-pipe, is mounted in the stuffing-box, and opens at its inner end into the outer end of the passage B^3 in the trunnion B' , so that an annular passage is formed between the two pipes for the escape of the water or steam introduced into the chamber C of the roll through the perforations in the pipes D^2 before described. The outer end of the exhaust pipe also enters the goose-neck G, from which the outlet pipe H' in communication with the exhaust pipe leads. By reference to Fig. 1 of the drawings, it will be seen that the goose neck is provided with two independent chambers, into one of which the inlet pipe G' leads, and from the other of which the outlet pipe H, leads. I do not, however, claim the goose-neck or stuffing-box as novel, nor do I limit myself to using connections of this character, as they may be replaced by anything else which will answer the purpose. In case both trunnions are provided with a central longitudinal passage, the outer end of the trunnion B should be closed by a plug or a cap, in the illustration of which I have shown a plug B^4 . It is not necessary that the trunnion B have a central longitudinal passage, although it is more convenient to manufacture the roll in that way.

It will be understood that when steam, water, or any other heating or cooling medium is introduced into the roll through the means provided therefor, it will be jetted directly against the bottoms of the spaces between the ribs of the roll, so that it will act immediately upon the roll at points very near the surface thereof, whereby the roll is readily kept at an unvarying uniform temperature throughout its area. After being discharged through the perforations, the water or steam flows outward through the passage B^3 , thence into the exhaust pipe H, thence into the goose neck G, and thence out through the outlet pipe H' . I shall preferably employ either water or air as a cooling medium, and steam or hot water as a heating medium.

In Fig. 3 of the drawings I have shown a modified form of my improved roll. It will

be sufficient to say of this roll I, that it is constructed with an interior chamber I' , and with a heavy continuous spiral rib I^2 , extending throughout the length of this chamber, and of rather fine pitch. Within this roll I locate a coil J, the convolutions of which correspond in number to the number of ribs, and in diameter to the diameter of the chamber of the roll at points between the ribs. The exterior peripheries of the several convolutions of the coil are furnished with perforations j , through which water, air, or steam is jetted against the bottoms of the spaces between the ribs. The inner end of the coil is closed by a cap J' , while its outer end has a ball and socket, or universal joint connection with the inner end of the feed pipe K, which corresponds practically to the outer section E^3 of the feed-pipe shown in Fig. 1. The exhaust from this roll may be arranged in the same manner as the exhaust from the roll shown in Fig. 1, or in any other manner.

In Figs. 4 and 5 of the drawings I have shown another modified construction, designed in particular to be used in the construction of long rolls. This roll L has an interior chamber L' , and is constructed with a series of longitudinal ribs L^2 , which are centrally bowed, or inwardly extended so as to increase their strength in the middle of the roll. The metal of the roll between the ribs is also thickened, as at L^3 , for the same purpose. This roll may be provided with interior pipes, such as shown in Figs. 1, 2 and 3, or not, as desired. I may choose in some cases, particularly where water is abundant, to introduce it into the center of the roll without attempting to carry it to a point near the periphery thereof.

In Fig. 6 of the drawings I show a roll N, having an interior chamber N' , and reinforced by intersecting spiral ribs N^2 , which stiffen the roll against crushing and torsional strains.

It is apparent from the foregoing that still other forms and arrangements of reinforced rolls may be constructed in carrying out my invention, and also that the particular means employed for introducing the cooling or heating medium may be varied, and I would therefore have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A roll for a machine for working rubber, gutta-percha, paper, cloth, &c., the said roll being provided with trunnions and having a large interior chamber and reinforced against crushing and torsional strains by ribs projecting inwardly into the said chamber, substantially as described.

2. A roll for a machine for working rubber, gutta-percha, paper, cloth &c., the said roll being provided with trunnions, and having a

large interior chamber, and reinforced against crushing and torsional strains by ribs projecting inwardly into the said chamber and contracted or drawn together at the ends thereof, substantially as described.

3. A roll for machines for working rubber, gutta-percha, paper, cloth, &c., provided with trunnions, and having a large interior chamber, and reinforced against crushing and torsional strains by ribs projecting inwardly into the said chamber, the middle portions of the ribs and the middle of the periphery of the roll being thickened for additional strength, substantially as described.

4. A roll for machines for working rubber, gutta-percha, paper, cloth &c., the said roll having trunnions and having a large interior chamber, and reinforced by ribs projecting inwardly into the said chamber, and means located in the said chamber of the roll and arranged to jet a heating or cooling medium directly against the inner periphery of the roll

at points between the ribs thereof, substantially as described.

5. A roll for machines for working rubber, gutta-percha, paper, cloth, &c., said roll having trunnions, and a large interior chamber, and reinforced by ribs projecting inwardly into the said chamber; in combination with hollow headers located within the roll at the ends of the said chamber, and constructed with arms entering the spaces between the ribs thereof, pipes joining the arms of the said headers, and means for passing a heating or cooling medium through the headers and pipes, and then exhausting it from the roll, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK H. BREWSTER.

Witnesses:

H. F. WANNING,
L. E. MERWIN.