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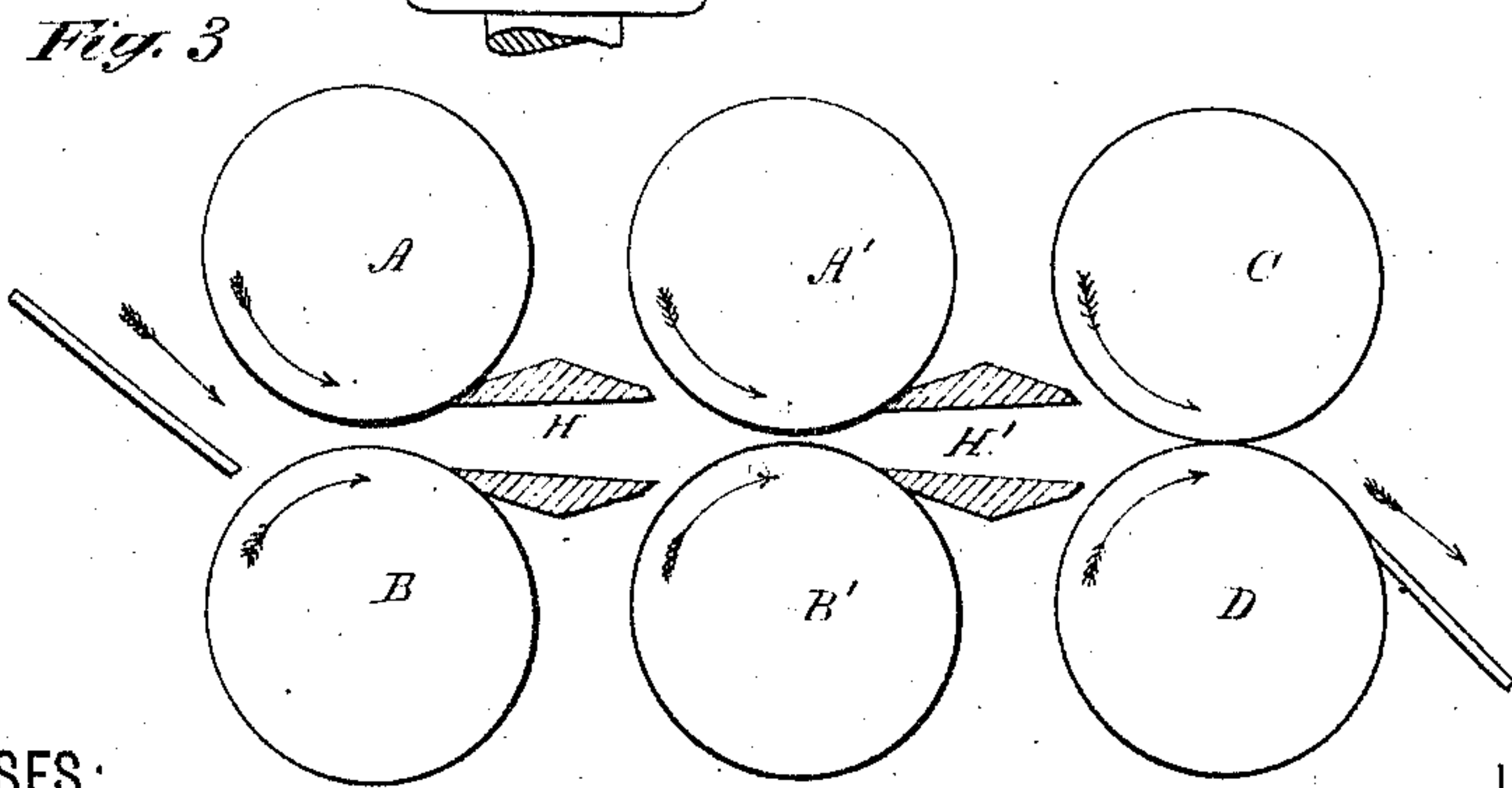
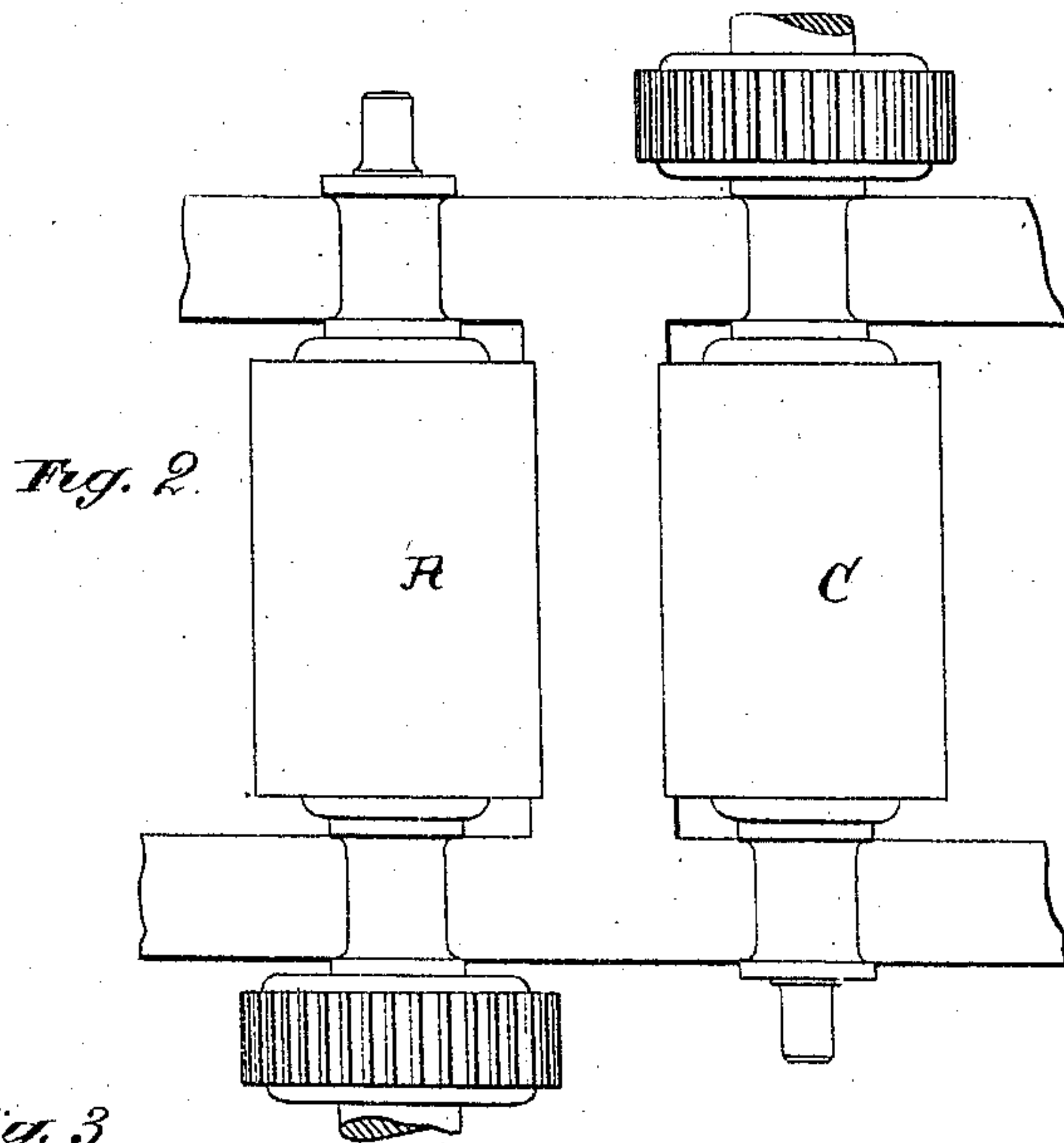
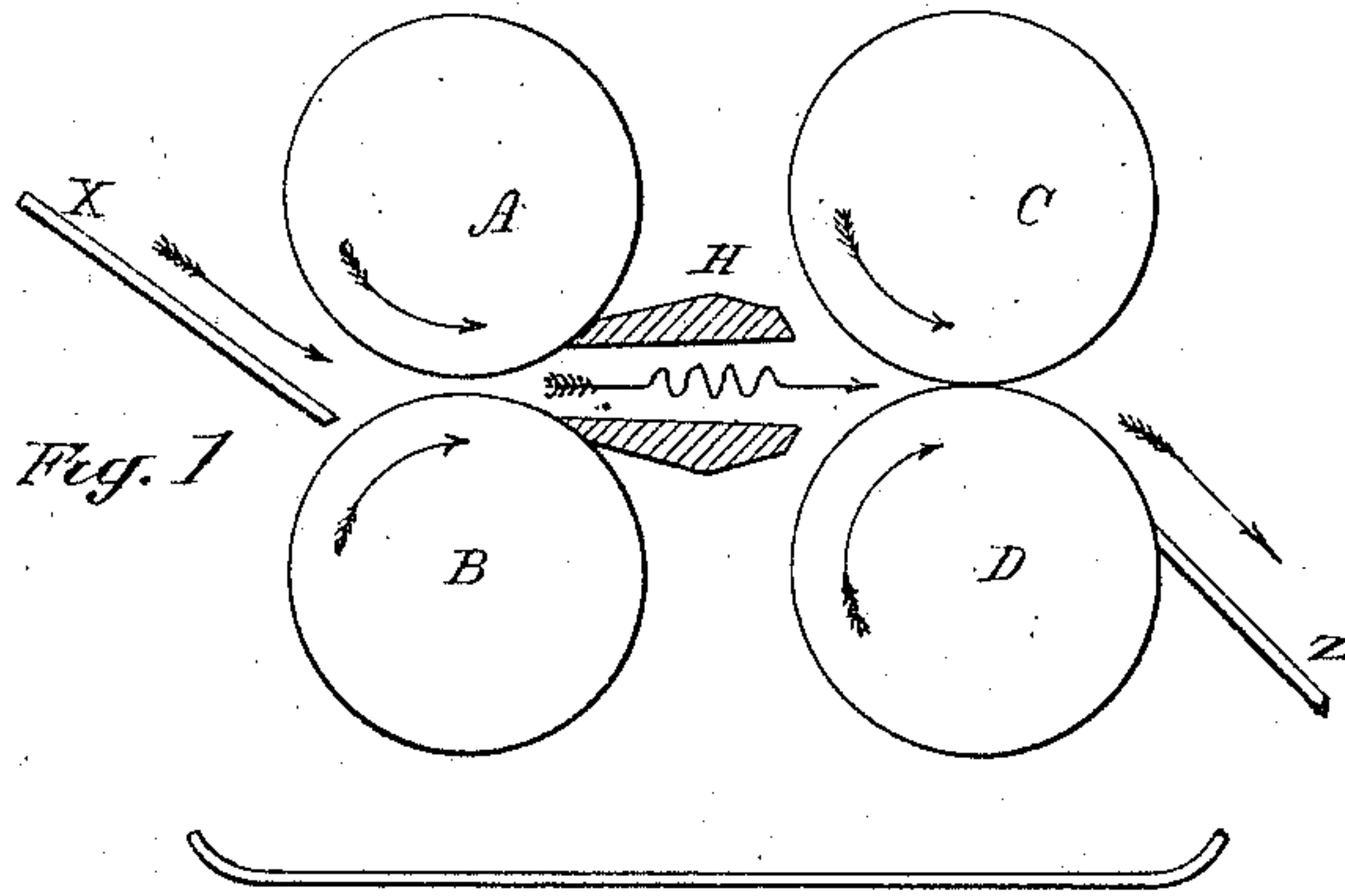
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3 Sheets—Sheet 1.

A. LEBLANC.  
SUGAR CANE MILL.

No. 408,630.

Patented Aug. 6, 1889.



WITNESSES:

*Raphael Netter*

*R. F. Gaylord*

INVENTOR

BY

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*Duncan Curtis & Page*  
ATTORNEYS

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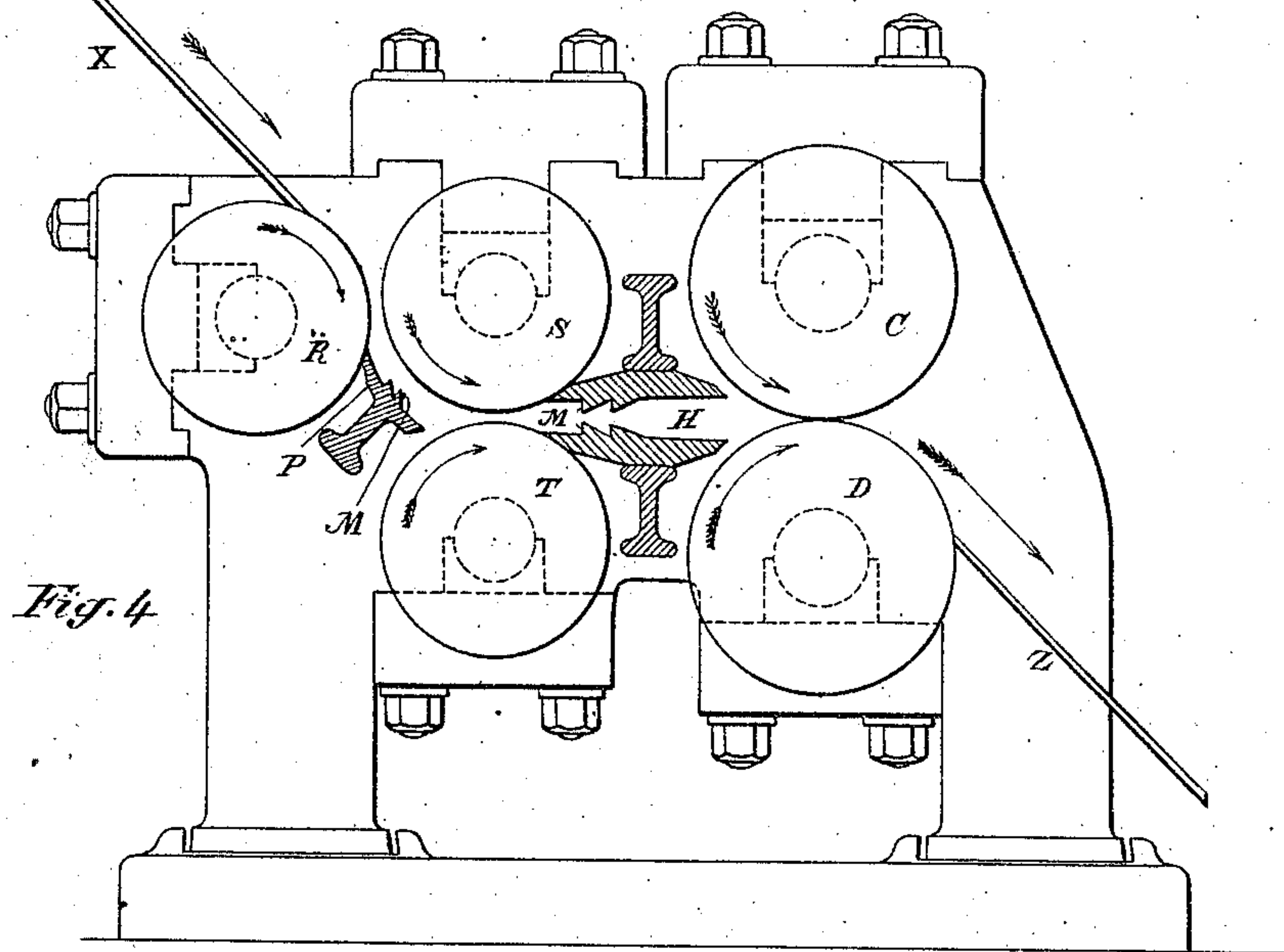
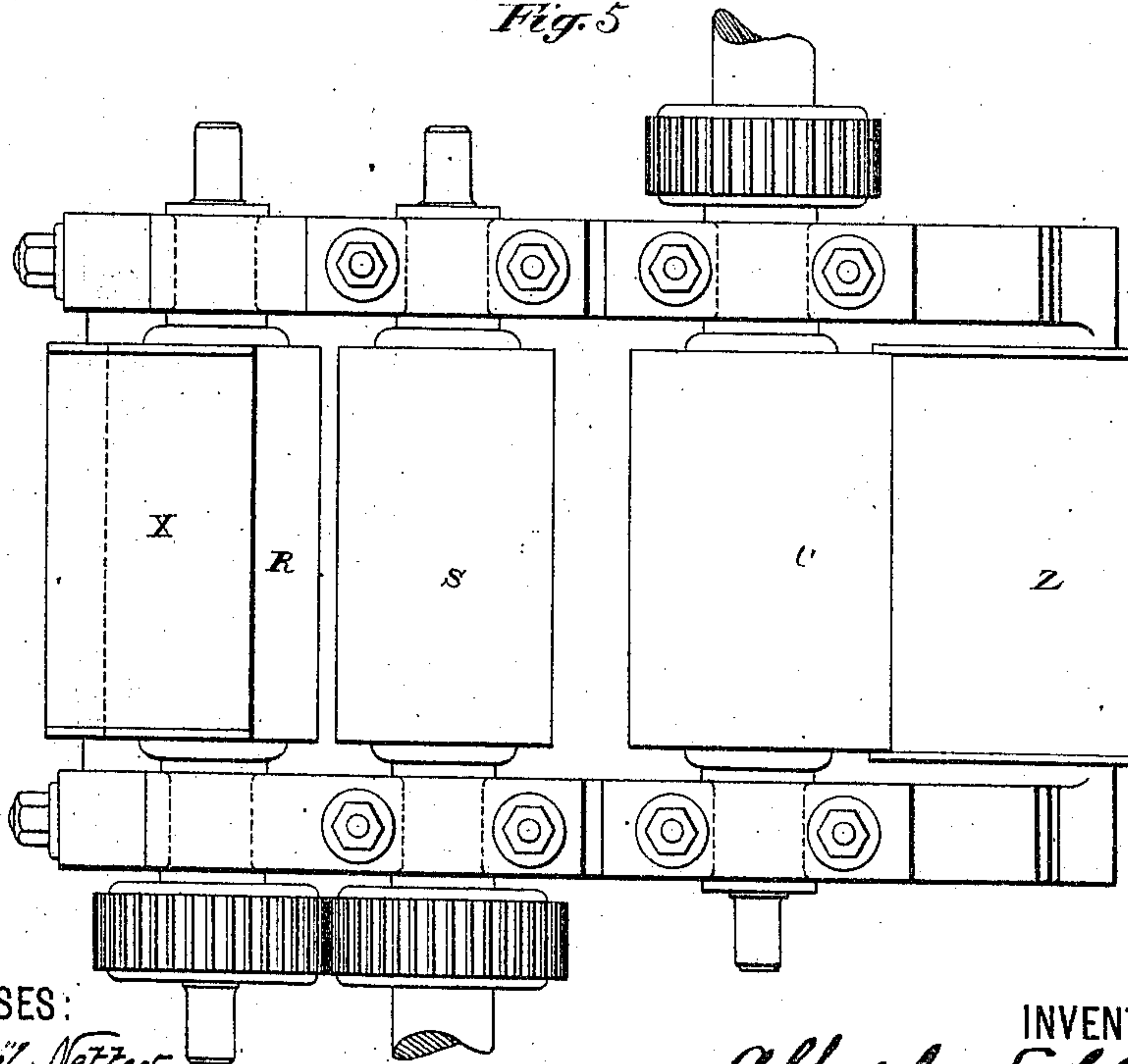


Fig. 4

Fig. 5



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(No Model.)

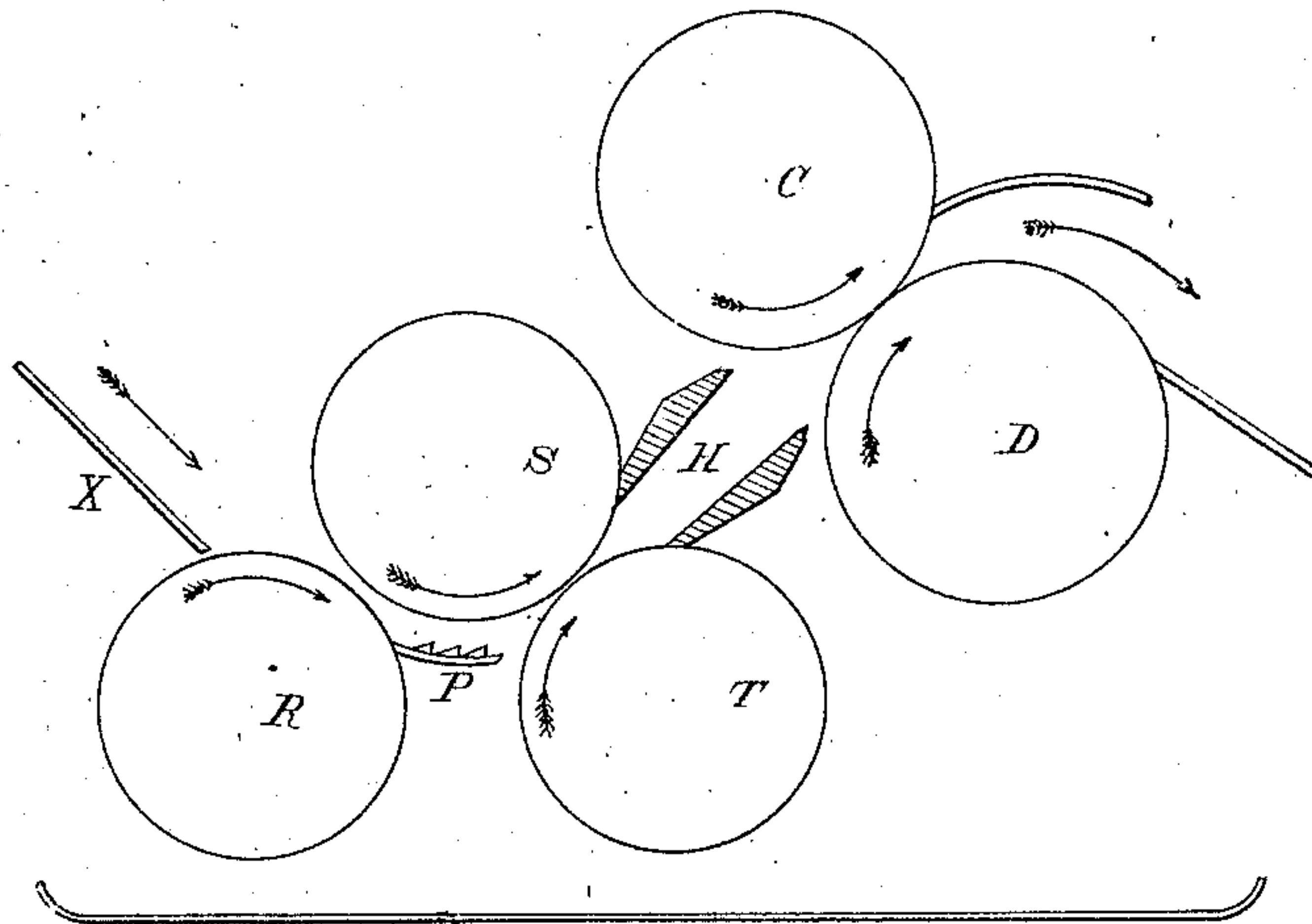
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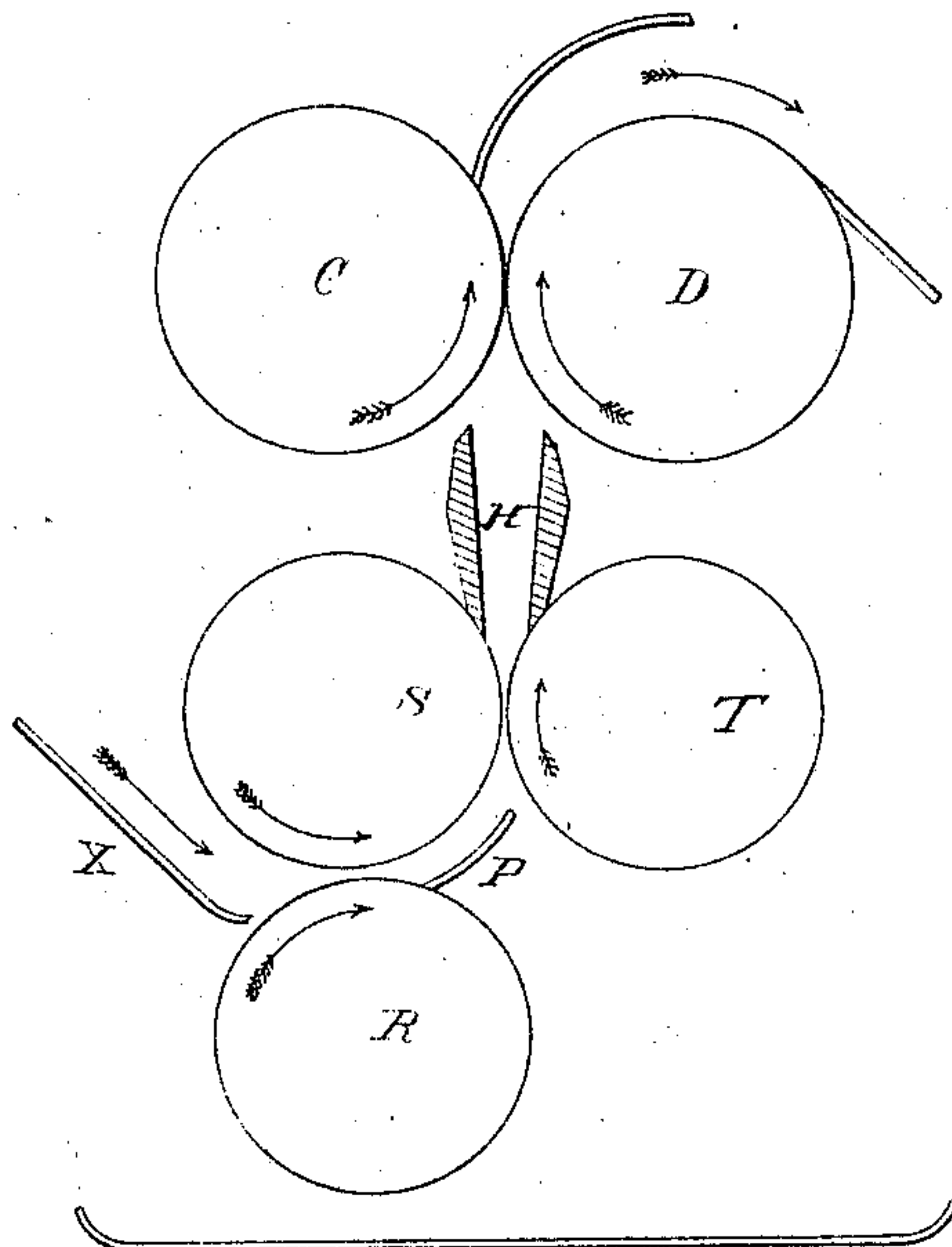
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*Fig. 6*



*Fig. 7*



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# UNITED STATES PATENT OFFICE.

ALFREDO LEBLANC, OF HAVANA, CUBA.

## SUGAR-CANE MILL.

SPECIFICATION forming part of Letters Patent No. 408,630, dated August 6, 1889.

Application filed October 20, 1888. Serial No. 288,624. (No model.)

*To all whom it may concern:*

Be it known that I, ALFREDO LEBLANC, a citizen of Spain, residing at Havana, Province of Havana, Island of Cuba, have invented certain new and useful Improvements in Sugar-Cane Mills, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention is an improvement in that class of sugar-cane mills in which the cane or bagasse from which the juice is to be expressed is passed through successive pairs of rolls.

The principle of construction usually followed in mills of this description is to mount the two or more pairs or sets of crushing-rolls in a suitable frame-work and to provide proper guides or channels between them for the passage of the cane or bagasse from one pair to the next. The pairs or sets of rolls have been in some instances geared together and driven by one common source of power, the power required to drive one set being transmitted through the other or others, while in others independent driving mechanism has been employed for each set or pair of rolls. In the former kind of mill boxes or covered guides have in some cases been employed as the means of conducting the bagasse from one pair of rolls to the other, an example of this being found in certain forms of mill in which two or more rolls are used in conjunction with one larger roll and all geared. The cane in such a mill is first passed between the large roll and one of the others and then directed through a channel or guide-chamber, by the sides or walls of which it is confined and conducted to another of the smaller rolls, and so on; but these arrangements do not properly fulfill the requirements of economical working. It will be understood that the working conditions in crushing the cane are very different from those required of the pressure-rolls through which the crushed cane or bagasse passes, and that in consequence the provisions made for feeding the cane to the first crushing-rolls are not suited to the feed of the bagasse to the other rolls, which, being geared positively to the first, move faster or slower, according to the pressure upon the cane. It has therefore been a fault in all former mills, so far as my information extends, that the bagasse is either fed to the pressure-

rolls irregularly, or that the speed of the pressure-rolls is independent of that of the crushing-rolls, the result being that the pressure of one pair of rolls is likely to be in advance of that of the other pair of rolls, and thereby cause shocks, breakdowns, or the loss of juice on account of bad crushing.

The object of my present invention is to feed one pair of cylinders or rolls from the other by means of a confining guide or box or chamber, and at the same time to drive each pair of rolls independently, with the purpose that each pair of rolls may be operated by a force or source of motive power independent of the other in such manner that the feed of one pair of rolls may be effected automatically by the conjoint action of the other rolls and the effect of the said box.

The object of the invention is also to subject the sugar-cane to a special treatment in its passage through the mill by constructing the said guide or box in a manner to disintegrate or tear the bagasse as it passes through it.

These improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a vertical view of a simple form of cane-mill embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a diagram view illustrating a modified form of mill. Fig. 4 is a diagram sectional view of another apparatus embodying my invention. Fig. 5 is a top and plan view of the same. Figs. 6 and 7 are vertical diagrams illustrating different forms of mill to which the invention is applicable.

In Figs. 1 and 2 A B represent a pair of crushing juice-expressing rolls of any ordinary cane-mill, X being the inclined guide by which the cane is fed to the said rolls.

C D are a second pair of rolls, which give the second pressure to the crushed cane, Z being the chute through which the bagasse leaves the mill. These two pairs of rolls are driven in any desired or convenient manner by sources of power independent of one another to the extent that a variation in the speed of one pair of rolls will not sensibly affect that of the other pair. The rolls are connected by an intermediate feed box or conduit H.

This device, which for convenience I call a



"box," is an inclosed or confining conduit guide or passage through which the bagasse as it issues from the rolls A B passes to the second pair of rolls C D. It may be constructed in many different ways with top, bottom, and sides, when necessary or desired. Its action is as follows: The rolls A B by their pressure reduce to bagasse the cane fed to them, expressing the greater part of the juice therefrom and distributing evenly the accumulating bagasse in the box or conduit II. The bagasse being more and more packed into this conduit II, moves forward, reaching the rolls C D only after having completely filled the conduit II, or, in other words, after having formed, as in a mold, a compact and homogeneous mass, which is presented with even thickness along the whole length of the second pair of rolls C D; but while this action is going on there is established at the same time, by the instrumentality of the box or conduit II, a pressure from the rolls A B against the rolls C D, which causes a certain resistance to the rotation of the feeding-rolls A B.

It is especially with the object of turning to advantage the effects of this intermediate pressure that I have driven the two sets of rolls by independent sources of power, in order that the feeding-rolls A B may not run faster than the others can dispose of the material supplied to them. In this manner the feeding of the bagasse to the rolls C D is effected evenly, uniformly continuous without choking, and automatically, and the treatment of the cane and expressing of the juice is accomplished more perfectly and economically. This feature of my invention is applicable generally to mills, without regard to the number or special arrangement of the crushing or squeezing rolls. For example, in Fig. 3 there are shown three pairs of rolls A B, A' B', and C D. In this case, to receive the advantages of my invention I insert an intermediate box or conduit II between the rolls A B and A' B', and a second and similar box II' between A' B and C D. Each pair of rolls in this apparatus is to be driven by an independent motor or source of power.

It is also obvious that my invention is applicable to mills having sets of three or more rolls, as in Figs. 4 and 5 and in diagram in Figs. 6 and 7. In these figures R S T form a set of three rolls. The rolls R and S are geared to the roll T, forming two crushers or squeezers and are driven by the same motive power. The pair of rolls C D is driven by an independent source of power, and is connected with the rolls R S T by the box or conduit II.

The cane is fed into the mill by the chute X, and is seized by the rolls R S, which crush it. It is then conducted along the guide-plate P to be seized by the rolls S and T, which pack it in the box or conduit II, whence it is finally withdrawn by the rolls C D, as above explained.

In this apparatus the rolls R S T may be regarded as the feeding-mill and rolls C D the receiving-mill, the action of the former being automatically regulated by that of the latter.

A feature of my invention applicable generally to mills having an intermediate box or conduit, as herein described, is shown in Fig. 4. On the inner surfaces of the box or conduit of any kind used to convey the bagasse from one set of rolls to the next I secure or form teeth or projections M of suitable form to divide and tear the fibers of the bagasse, thus opening the cellular structures of the material and preventing the reabsorption of the juice at the time when the bagasse issues from its last compression.

The teeth or projections M may be formed on the plate P, as shown in Fig. 4, or they may be similarly set in any channel or conduit through which the bagasse is forced to pass.

It will be observed that the means described in my patent, No. 304,012, of August 26, 1884, for the introduction of liquid and steam into the bagasse may be applied to this apparatus without material change.

What I claim as my invention is—

1. In a cane-mill, the combination, with two or more independently-driven sets of pressure-rolls, of intermediate closed boxes or conduit-chambers for confining and conducting the bagasse as it passes from one set of rolls to the next, as herein set forth.

2. In a cane-mill, the combination, with independently-driven sets of pressure-rolls, of intermediate closed conduits having teeth or projections on their inner surfaces for tearing and dividing the bagasse forced through said conduits from one set of rolls to the next.

3. In a cane-mill, the combination, with two or more sets of pressure-rolls, of closed guides or conduits for confining the bagasse as it passes to and from said rolls, and having teeth or projections on their faces for dividing and tearing the bagasse forced through them, as herein set forth.

ALFREDO LEBLANC.

Witnesses:

JOSEPH A. SPRINGER,  
ESTEBAN A. ROBERT.