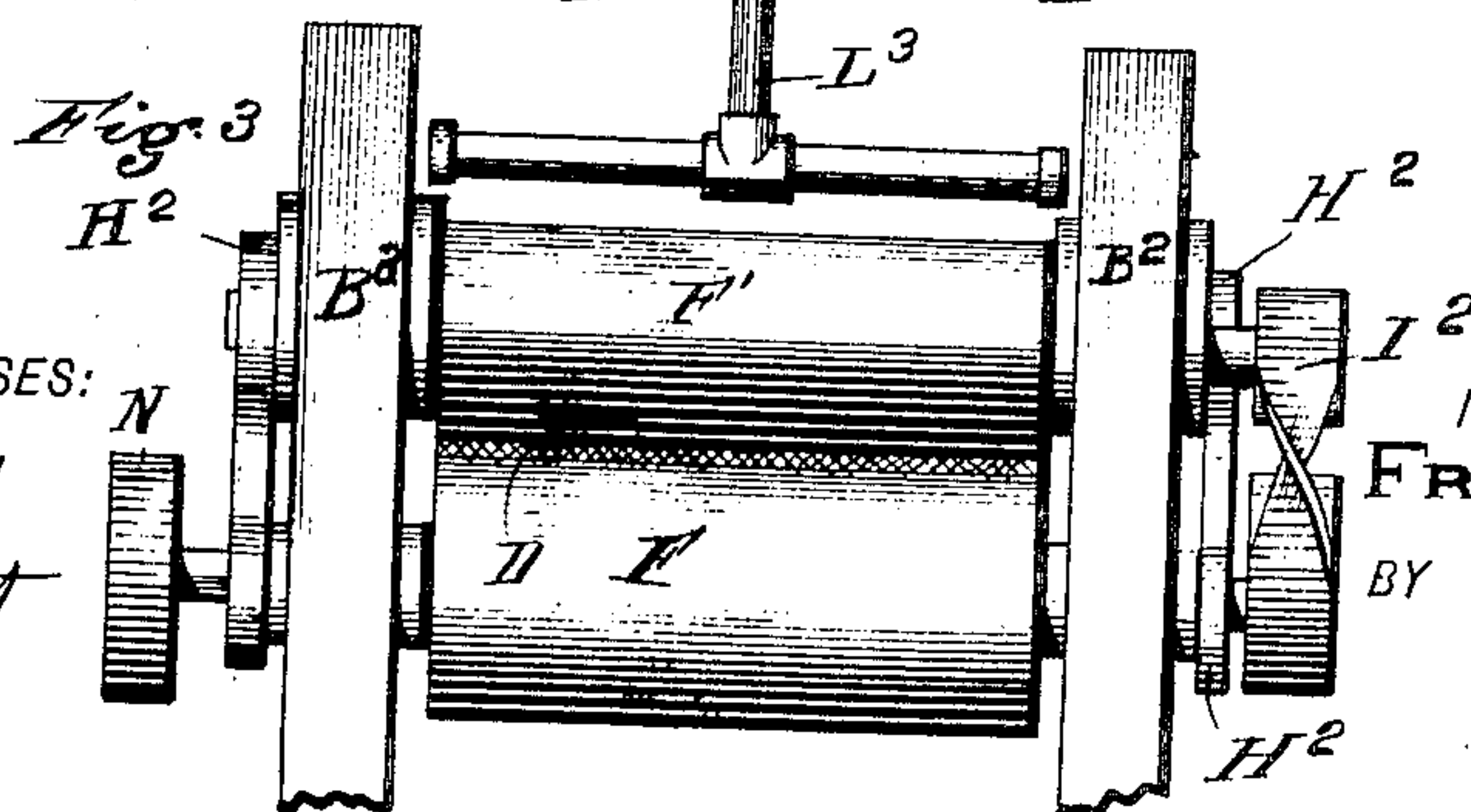
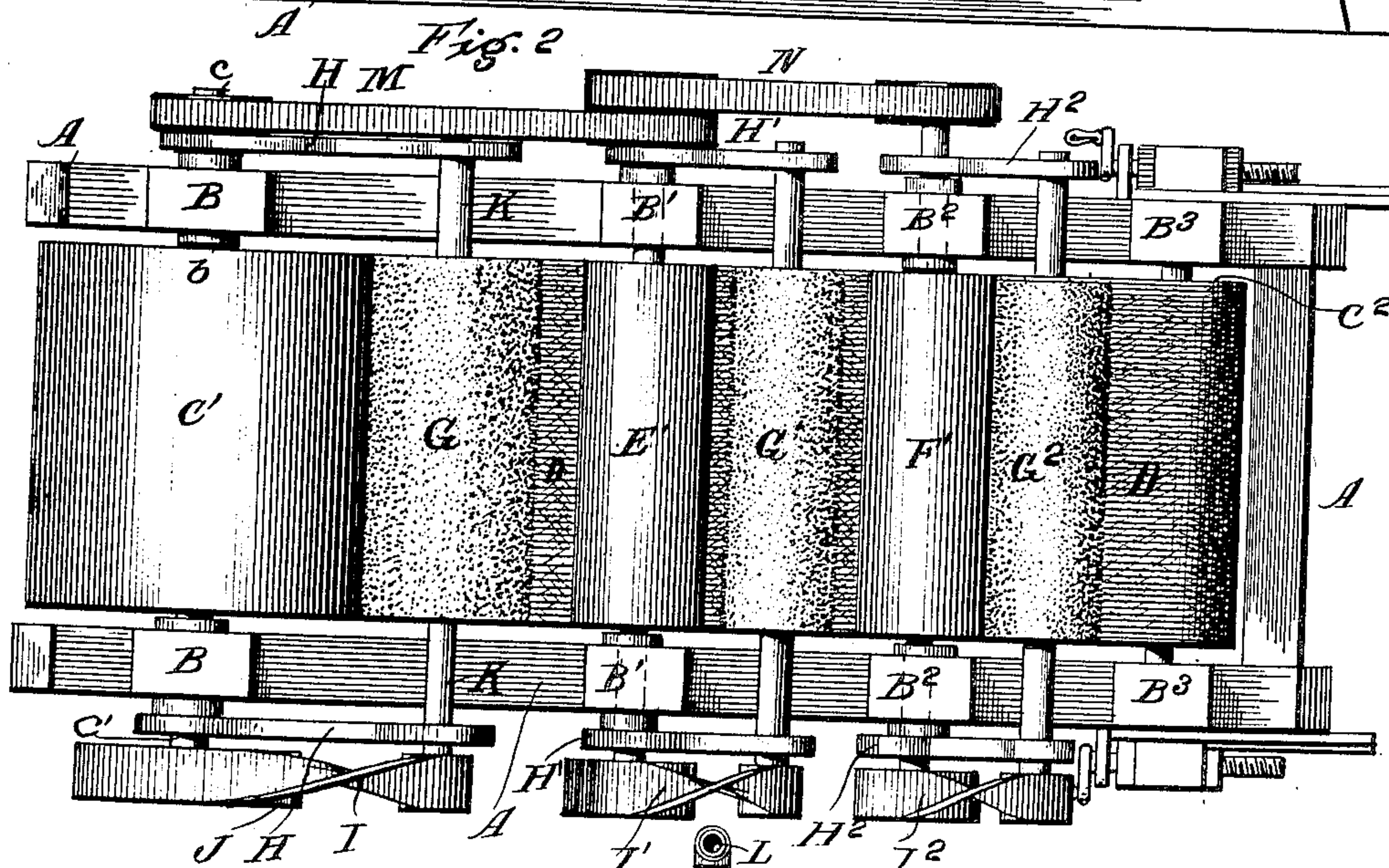
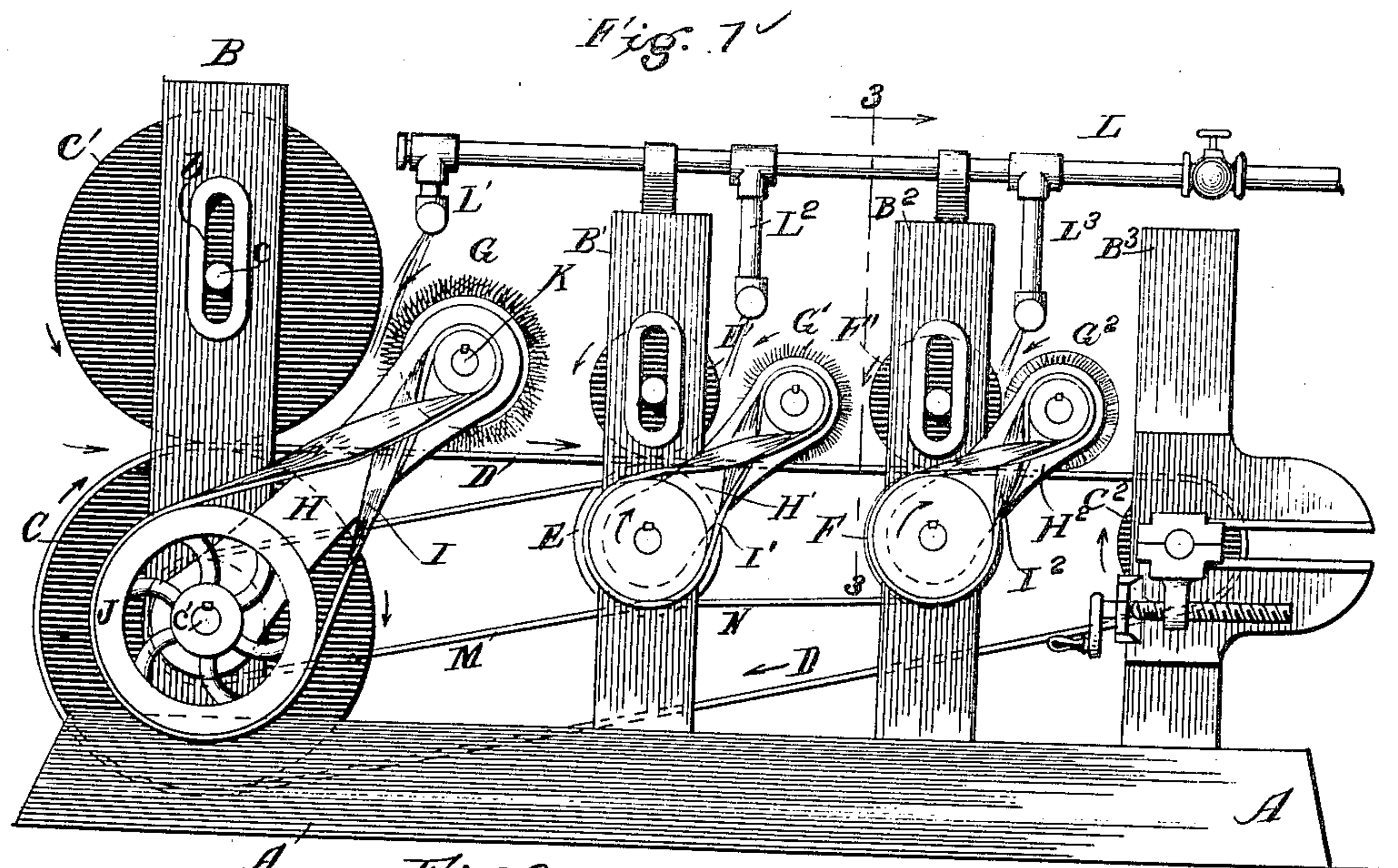


No. 828,822.

PATENTED AUG. 14, 1906.

F. S. MACY.
FIBER CLEANING MACHINE.
APPLICATION FILED OCT. 30, 1905.



WITNESSES:
W. E. Duffey
Amos W. Hart

INVENTOR
FREDERICK S. MACY
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

FREDERICK S. MACY, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WILBURT T. JENKINS, OF PITTSBURG, PENNSYLVANIA.

FIBER-CLEANING MACHINE.

No. 828,822.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed October 30, 1905. Serial No. 285,117.

To all whom it may concern:

Be it known that I, FREDERICK S. MACY, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Improved Fiber-Cleaning Machines, of which the following is a specification.

My invention is an improved machine for treating fibrous plants—such as Manila hemp, ramie, maguey, sisal, and piña—for separating the fibers from the pulpy and gummy portions; and a special object I have had in view is the production of a machine distinguished by simplicity and economy of construction and rapidity and efficiency in work and operation.

The details of construction, arrangement, and combination of parts are hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my improved machine. Fig. 2 is a plan view of the same, the spray-pipe being omitted; and Fig. 3 is a vertical section on the line 3 3 of Fig. 1.

The movable parts of the machine are arranged in a wooden frame, comprising a horizontal base portion A and a series of pairs of vertical posts or standards B B' B² B³, the members of each pair being arranged opposite transversely and spaced apart to accommodate crushing-rolls and rotary brushes, as will be understood by reference to the drawings.

In the first pair of standards B are journaled two large initial crushing-rolls C C'. The lower roll C has journals held in suitable boxing in the base of the standards, while journals c of the upper roll C' project into and are adapted to slide in vertical slots b, provided in the upper portions of the standards. It is apparent that by this construction and arrangement the upper roll C' may adjust itself vertically according to the quantity and other conditions of the fiber plants passing between the rolls. The plants are delivered between the rolls from a table or carrier or by any other means that may be selected. An endless traveling belt D, which for convenience will be termed a "carrier," passes around the lower roll C and a small roll C²,

which is journaled in the last series of posts B³ and provided with movable journal-boxes to provide for taking up the slack of the carrier. In the second pair of posts or standards B' is arranged a pair of smaller crushing-rolls E', the upper run being arranged for vertical movement like the large roll C'. In the third pair of posts B² is similarly arranged a pair of small crushing-rolls F F'. Between initial crushing-rolls C C' and the adjacent pair E E' is arranged a rotary brush G, the same being journaled in the upper free ends of bars H, which are journaled on the axis c' of the lower crushing-roll C. Since the arms H are free to oscillate in a vertical plane, it is obvious that the brush G is similarly free to move vertically. It is rotated in the direction of the arrow, Fig. 1, by means of a crossed belt I, the same passing around a large pulley J on the axis of roll C and around a smaller pulley K on the axis of the brush G. Thus the brush is caused to rotate in the same direction as the upper roll C'. A smaller rotary brush G' is similarly arranged between the pairs of small crushing-rolls E E' and F F' and similarly mounted in oscillating arms H' and driven in the same way by a crossed belt I'. A third brush G², similar in size to the brush G', is arranged in rear of the last crushing-roll F' of the series and is similarly journaled in arms H² and driven by a crossed belt I².

A water-supply pipe L is arranged overhead and provided with pendent spray-pipes L' L² L³, which are located, respectively, over and in front of the brushes G, G', and G², or, in other words, at such point that the water discharged therefrom is delivered upon the crushed fiber at points between the roll C' and brush G, the roll E' and brush G', and the roll F' and brush G². The lower crushing-roll E is driven from the axis c' of roll C by an open belt M, (see Fig. 2,) and the lower roll F is similarly driven by an open belt N from the axis of the roll E, while the upper crushing-rolls C', E', and F' are driven by friction with the endless carrier D, or rather with the fibrous plants passing between the rolls.

The operation of the machine as a whole will now be understood as follows: The large

roll C' being driven in the direction indicated by arrows it is obvious that the endless carrier will be driven so that the upper run will travel from the said roll. Thus the fibrous plants are carried between the initial crushing-rolls and the succeeding crushing-rolls and beneath the brushes successively. Owing to the size and weight of the roll C', the fibrous plants are subjected to a heavy crushing effect, so that their bodies, branches, and stems are crushed and flattened to such a degree that the initial brush G may act on them with great effect—that is to say, the brush G is rotated at a high rate of speed, so that the pulpy and gummy parts of the plants are rapidly brushed away, the separation being greatly aided by the delivery of the water-spray thereon previous to and during the action of the brush. The several sets of crushing-rolls should be sufficiently near to each other that those in advance may have a hold upon the mass of fiber before the latter passes out from under the preceding rolls. Thus the free ends of the fibers are necessarily picked up more or less by the brush during their passage under it, while the other ends are still held by the preceding rolls. In other words, the effect of the rapid rotation of the brush is to lift up and comb out the free ends of the fibers and no tangling will occur. From the initial brush G the fiber which has been subjected to the treatment described passes between the first pair of smaller crushing-rolls and then beneath the succeeding brush, where the operation is repeated with a small discharge of water-spray. The fiber thence passes to and between another pair of rolls F F', and beneath a succeeding brush G², where the final crushing and cleaning operation takes place. It will be understood that I propose to employ any required number of crushing-rolls and brushes, the same being varied according to the nature of the fiber plant to be treated; but the farther the process advances the lighter may be the rolls and the smaller the brushes.

It is apparent that in the progress of the fibrous plants through the machine they are subjected to a very heavy crushing action at the outset and that the succeeding rolls after the first operate upon smaller portions of the plants than the first ones, or, in other words, upon fibers which have been more or less separated and freed of pulp and gum. It is obvious, therefore, that the succeeding rolls, after the first pair, may be made comparatively small and light. The adaptation of all the upper rolls for vertical movement enables them to accommodate themselves perfectly to the mass of fiber, so as to impose a crushing effect thereon at all points, and the adaptation of the brushes for vertical play or oscillation similarly adapts them to act upon

the fibers with an advantage which could not be obtained if the brushes were fixed in position.

It will be seen that the machine is simply and cheaply constructed, while it is operated with great reliability and rapidity, so as to produce a large output of cleaned fiber in a comparatively short time.

It is preferred that the frame be constructed of wood for the purpose of preventing discoloration of the fiber, which is an objectionable feature in most machines constructed of metal.

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

1. The improved fiber-cleaning machine comprising a frame, a pair of heavy initial crushing-rolls and succeeding pairs of smaller crushing-rolls, one of each pair being arranged over the other and adapted for free vertical movement, a vertical guide for the journals of such upper rolls, an endless carrier passing over the several lower rolls of the series, a series of rotatable brushes arranged over the carrier and between each pair of upper crushing-rolls, arms journaled on the axes of the lower rolls of each pair and the aforesaid brushes being journaled in the upper ends of the same so that the brushes are free to oscillate vertically, means for driving the lower rolls of each pair in the same direction, and the several brushes in an opposite direction, and a water-spray pipe having pendent portions arranged to discharge between the brushes and the rolls in front of them, substantially as described.

2. The improved fiber-cleaning machine comprising a frame, a pair of heavy initial crushing-rolls, succeeding pairs of smaller crushing-rolls, the lower rolls having journals fixed in the frame and the upper rolls being adapted to oscillate vertically, an endless carrier whose upper run passes between the crushing-rolls of each pair, a rotary brush arranged between the two upper rolls of adjacent pairs, supports for said brushes which are free to oscillate in a vertical plane, and means for driving the lower crushing-rolls in the same direction and the brushes in the opposite direction, substantially as described.

3. In a machine for the purpose specified, the combination with a frame, having vertical standards provided in their upper portions with vertical slots, of pairs of crushing-rolls, the lower ones having their axes journaled at fixed points in said standards and the upper rolls having journals projecting into and adapted to slide easily in the slots of the standards, an endless carrier whose upper run passes between the rolls of each pair, rotary brushes arranged between the upper rolls of succeeding pairs, arms pivoted upon

the axes of the lower rolls and the brushes jour-
naled in the upper ends of said arms so that
they are free to oscillate vertically, portions
arranged on the axes of the lower rolls and
5 crossed belts running thereon and upon
smaller portions applied to the axes of the
brushes, and a water-supply pipe having a

spray-discharge nozzle arranged over the
brushes and adjacent to the rolls in front
thereof, substantially as described.

FREDERICK S. MACY.

Witnesses:

W. A. FELTYBERGER,
ROSEMAN GARDNER.