

No. 679,164.

Patented July 23, 1901.

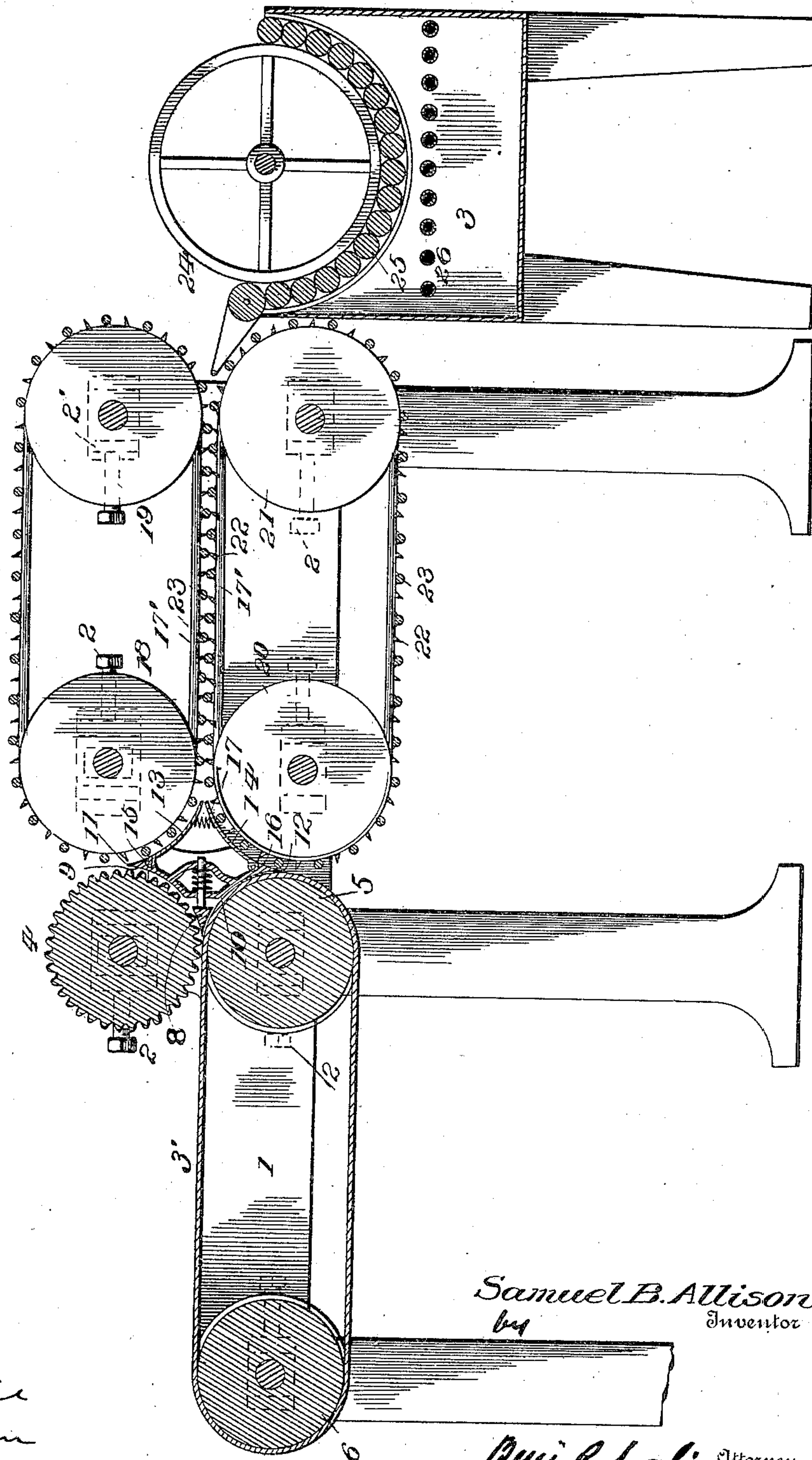
S. B. ALLISON.
FIBER SEPARATING MACHINE.

(No Model.)

(Application filed May 3, 1898. Renewed Apr. 30, 1901.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses

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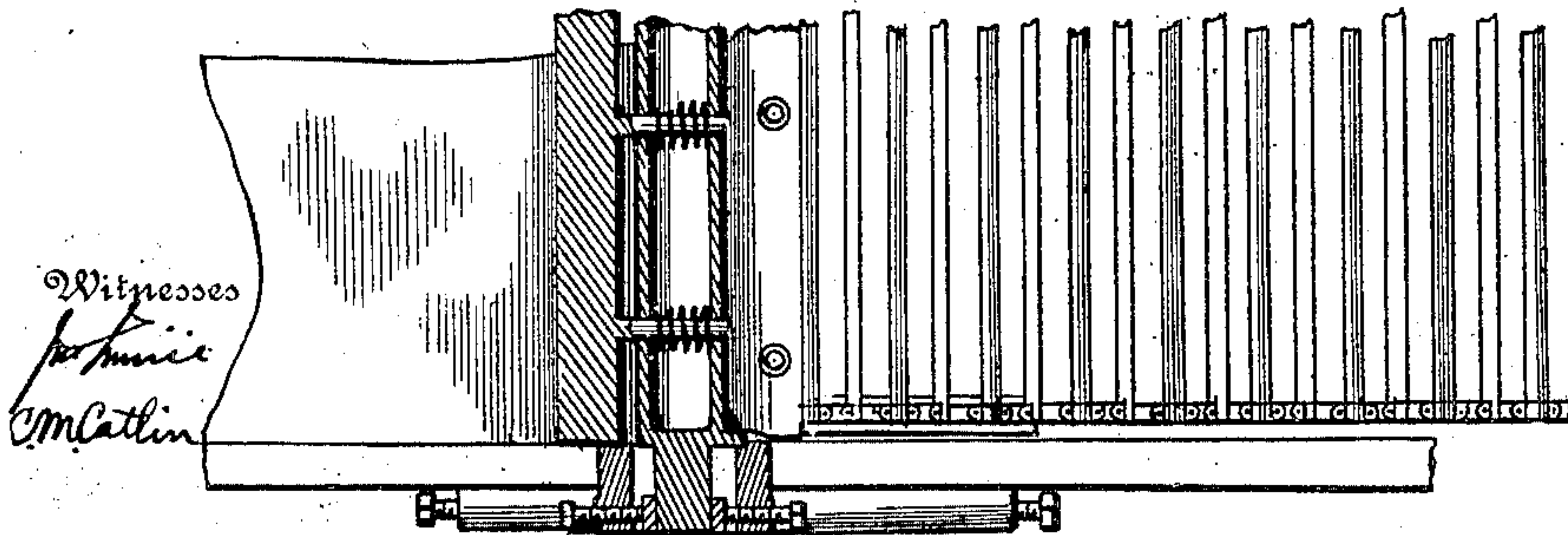
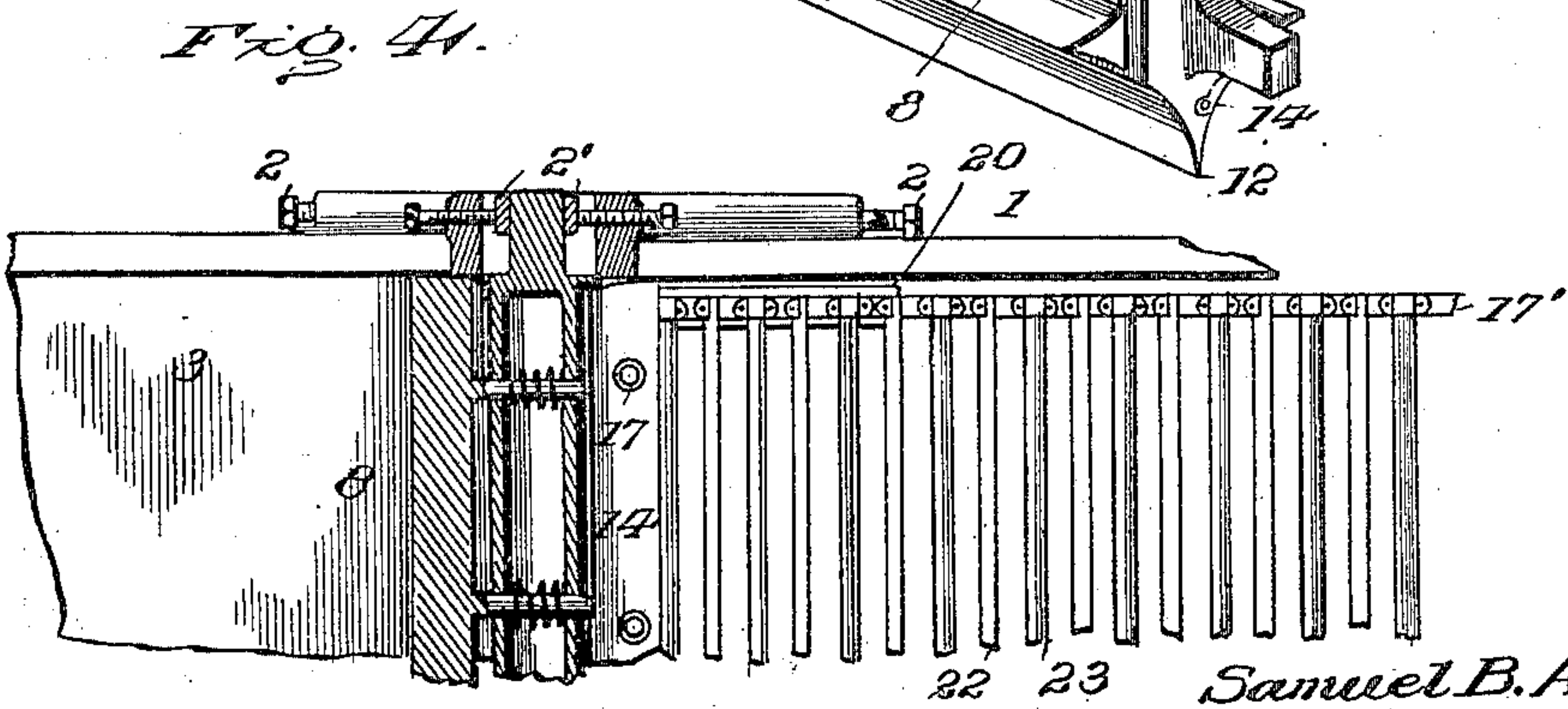
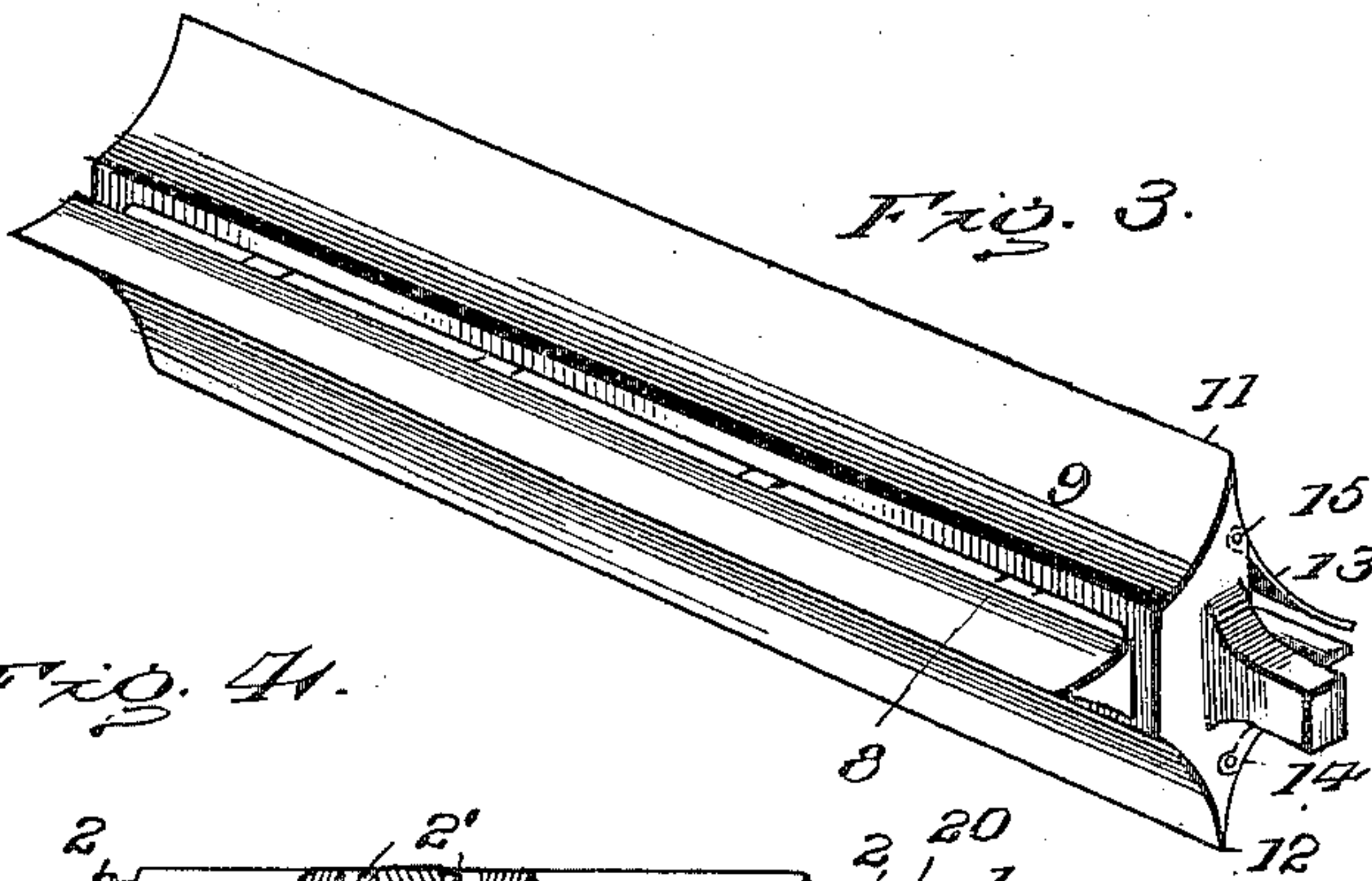
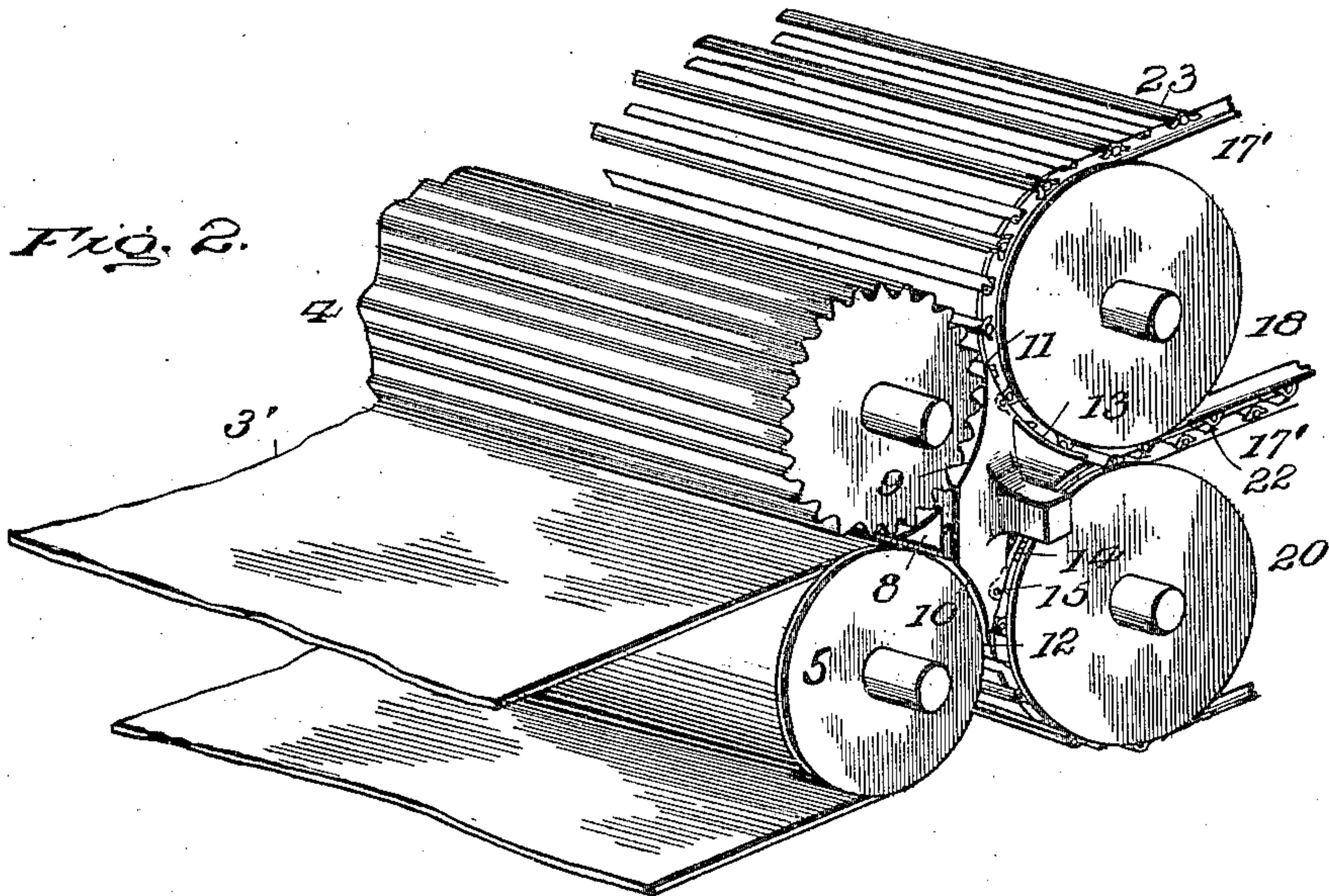
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4 Sheets—Sheet 2.



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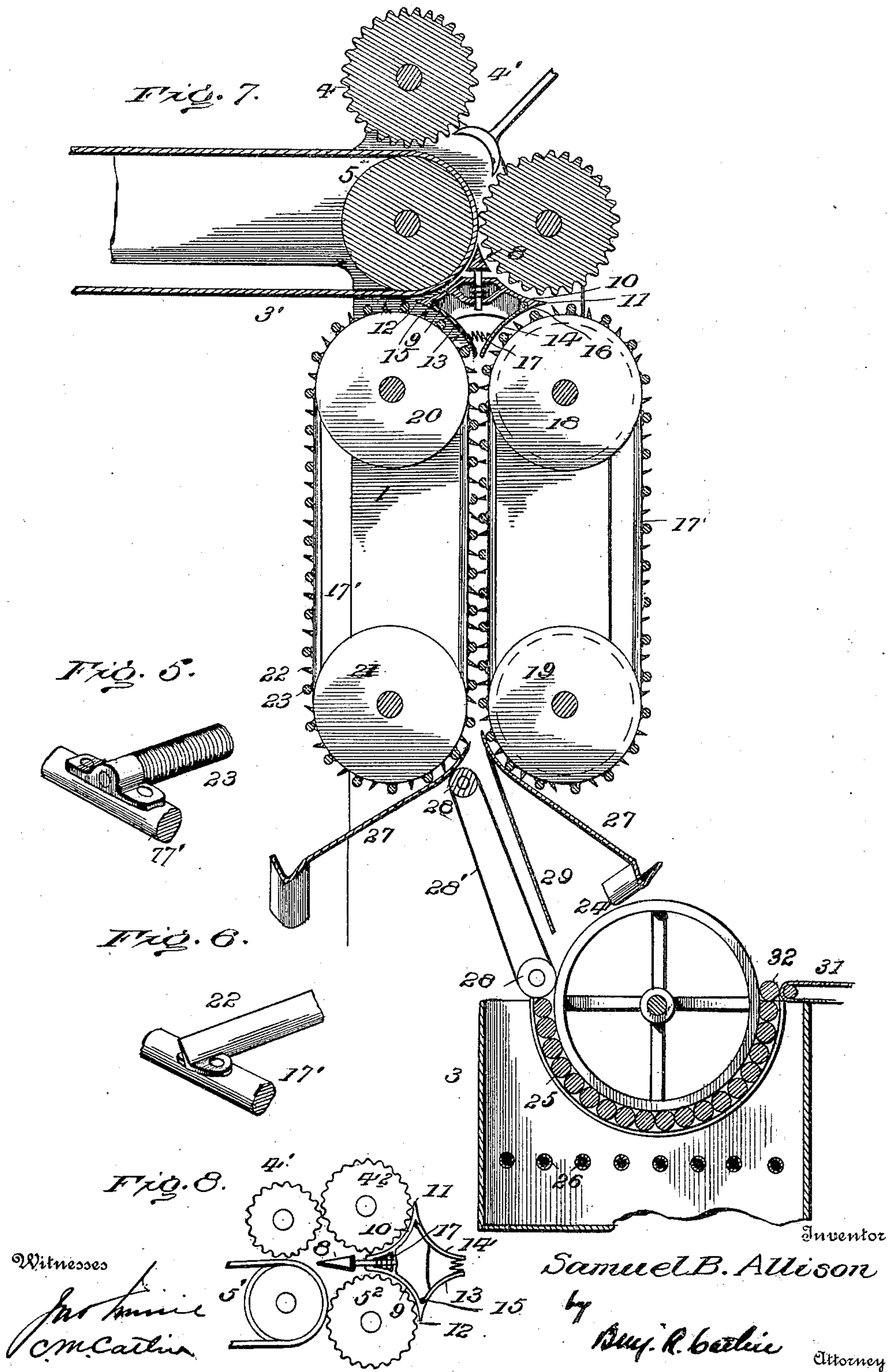
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4 Sheets—Sheet 3.



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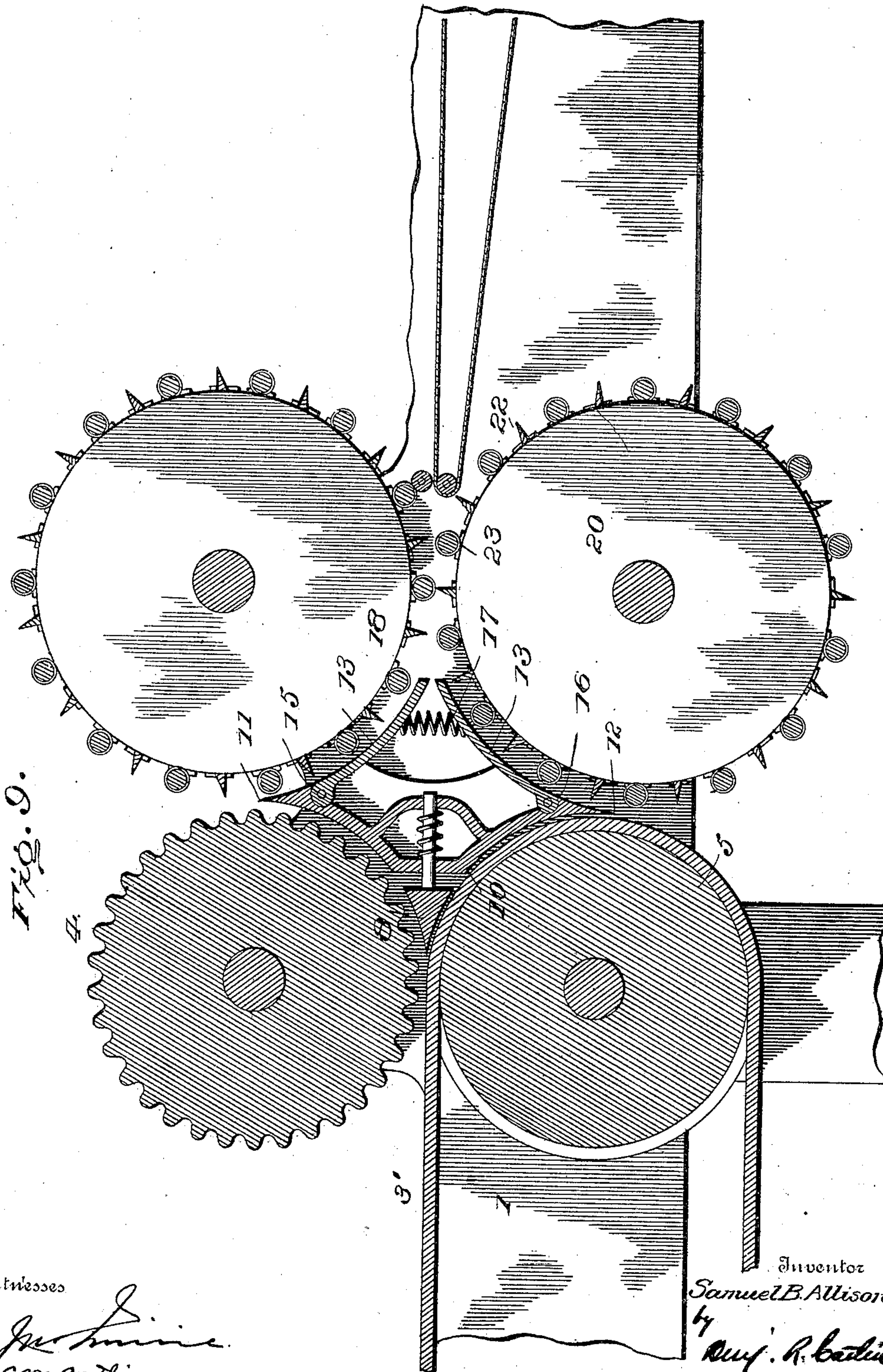
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(No Model.)

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4 Sheets—Sheet 4



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UNITED STATES PATENT OFFICE.

SAMUEL BENJAMIN ALLISON, OF NEW ORLEANS, LOUISIANA.

FIBER-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 679,164, dated July 23, 1901.

Application filed May 3, 1898. Renewed April 30, 1901. Serial No. 58,220. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BENJAMIN ALLISON, a resident of New Orleans, in the parish of Orleans and State of Louisiana, have
5 invented certain new and useful Improvements in Fiber-Separating Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to
10 which it pertains to make and use the same.

The invention relates to machines for separating fiber from the green leaves or stalks of various plants—such as petrea, pineapple, banana, and others—and has for its object to
15 increase their efficiency and economical result, including an improved product; and it consists in the construction hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is
20 a central section of the improved machine. Fig. 2 is a partial isometric view of the same. Fig. 3 is an isometric view of a splitting-blade and holder. Fig. 4 is a partial plan, the upper rollers being removed and showing
25 a section of the splitting-blade. Figs. 5 and 6 are enlarged views of details, showing means for connecting bars and blades to chains or rope. Fig. 7 is a partial vertical section of the machine in a modified arrangement. Fig.
30 8 is a partial elevation of a modification on a reduced scale and diagrammatic in character, and Fig. 9 is a section of a modification.

Numeral 1 denotes the machine-frame.

2 denotes screws for adjusting bearings of
35 the various rollers, respectively. Preferably these bearings comprise an elastic part to allow the rollers to yield slightly under pressure.

3 indicates a tank for cleansing fiber from
40 gum and other foreign matter.

32 (see Fig. 7) is a delivery or gripping roller, and 31 a delivery or fiber-carrying belt.

3' denotes an endless belt for supplying material to feed the crushing-rollers. This
45 belt runs on rollers 5 and 6. The crushing-rollers 4 and 5 may have any suitable surface. It is, however, preferred to corrugate the upper roller longitudinally.

8 denotes a leaf or stalk splitting blade.
50 Its front edge is situated partly between the feeding-rollers and is held by a spring or

springs preferably within about one thirty-second of an inch of the upper roller for the purpose of splitting green pulpy leaves, which are fed into the machine with their
55 more fibrous portion above and more pulpy portion below. The pulp is largely separated from the fiber by this knife and is discharged subsequently by gravity from the machine. The comparatively small amount of fiber,
60 however, which passes with the pulp below the splitting-blade, as well as that which passes above, is acted upon by the mechanism next to be described.

9 and 10 denote working beds having con-
65 cave surfaces similar to the convex surfaces of the adjacent feed-rollers and coöperating with them to grip and rub the parts of the split leaves. The beds 9 and 10 terminate, respectively, at 11 and 12 in sharp edges
70 adapted to scrape remaining pulp from the fiber as it is drawn across them. 13 and 14 denote similar-shaped beds reversely placed and supported by hinges 15. Preferably the
75 upper edges of these beds are covered by parts of beds 9 and 10, as most clearly indicated in Fig. 9.

17 denotes spring-supports for beds 13 and 14, situated near their edges opposite their
80 hinges.

Two pairs of endless chains or ropes 17' are supported and moved by rollers 18 and 19 and 20 and 21, respectively, and carry scraping-
85 blades 22 and circumferentially-corrugated or combing bars 23, the chains connected by the blades and bars constituting endless belts. The bars 23 are rollers and rotate in bearings fixed on the ropes, as indicated in Fig.
90 5. The belts may be run at various absolute and relative velocities, as found desirable, according to the character and condition of the particular material under treatment. The rollers will be rotated by the blades which force the material into its grooves and
95 cause more or less combing or dragging action. The separation of the fiber by the roller corrugations and the coaction of the blades produce this combing effect. The blades and rollers are placed alternately in each belt, and when in operation are sufficiently near to
100 touch each other, except for the interposition of the fiber, and this is pressed into the cir-

cumferential grooves of the rollers by the blades, so that the fiber is separated lengthwise the rollers and virtually combed as well as scraped. This action follows that of a part of the blades and rollers coöperating with the edge 11 to scutch the material. The lower rollers and blades coact with edge 12 to scutch the lower portion of the split material, consisting in many cases largely of pulp. The construction favors the speedy discharge of pulpy waste.

The main body of the pulp is discharged directly down from roller 5 by gravity. In some cases the feed-rollers (see 4' and 5', Fig. 8) simply deliver leaves or stalks to the splitting-blade, and additional rollers 4² and 5² are provided to coöperate with beds 9 and 10 in separating the remnant of pulp and refuse from the fiber of the split material. In such case the main portion of pulpy leaves will drop from the roller 5, as in the first-described construction. The separate portions of fiber passing near the edges 11 and 12 are caught by the blades and rollers of the endless belts and forced against the hinged spring-held beds 13 and 14 and then brought together and drawn forward and delivered to the washing-tank 3 by the aid of a rotating drum 24. A bed of rubbing-rollers is denoted by 25, and heating-pipes for the washing liquid by 26.

By the use of hot solutions of suitable character or of hot water the gum and extractive matter can be much more easily and thoroughly washed from the green freshly-treated fiber than by treatment after drying, whether it be of the entire leaf or plant or of the material after it has been subjected to scutching-machines. The heating devices are regarded as important and also the combination of the washing devices, which are not new in themselves, but only in combination with the mechanism for treating green materials and separating and discharging the main part of the pulp near the feeding end of the machine.

Fiber separated from the green plants and immediately washed preserves its luster and strength; but both these qualities are impaired in case the materials are dried at any stage before washing, so that the gum becomes inspissated and the fiber stained and otherwise deteriorated, and, further, powerful chemical solvents are necessary to wash out the hardened gums and residuals of the dried juices.

The invention is not in all respects limited to the horizontal arrangement shown in Figs. 1 and 2 and the machine may be arranged as indicated in Fig. 7, which, however, does not separate refuse and drop it from the machine at so early a stage of its operation, and is therefore not preferred. It, however, may be employed, if desired, and more particularly with dried or partially-dried material. In this form chutes 27 to convey away refuse are provided and also rollers 28 and an endless belt 28' to draw the fiber and pass it to a guide 29, that leads to a washing-tank.

Preferably all the mechanism acting on the materials or that is exposed to contact with the pulp and with juices will be made of brass or other metal not acted upon by the vegetable acids.

The automatic movement of the spring-supported splitting-blade and the like movement of the hinged and spring-supported beds 13 and 14 are considered of special value.

The construction is such that the tail end of the fiber is cleaned without recleaning the material and passing it through in a reversed manner, as practiced in many prior machines.

In some cases rollers comprising heads or disks connected by blades and circumferentially-grooved rotating combing-bars may be substituted for such blades and bars carried by endless chains. Such construction is shown in Fig. 9, in which 20 denotes disks connected by blades 22 and combing-bars 23.

31 is an endless belt to carry off the cleaned fiber. Such belt can be used with any form of machine, as indicated in Fig. 7.

32 denotes a gripping-roller coöperating with a belt-roller to draw the fiber from the machine. This modification is suitable for flax, hemp, jute, ramie, and similar fibrous plants having woody stems. Other forms of the machine are better adapted to the pulpy leaves of pineapple, banana, and the like.

Having described my invention, I claim—

1. In a fiber-separating machine, the combination of a pair of rollers adapted to feed material, a splitting-blade, springs to hold the blade in a yielding manner, and scutching devices, substantially as described.

2. In a fiber-separating machine, the combination of a pair of rollers adapted to feed material, a splitting-blade, springs to hold the blade in a yielding manner, and scutching devices, said devices comprising a working bed having the edge 12 situated below the splitter to act upon the more pulpy parts of the material and permit waste to fall immediately out of the machine.

3. In a fiber-separating machine the combination of feed-rollers, a bed having a sharp upper edge and conformed to the upper roller to hold material to be acted upon by said roller, a hinged spring-supported bed situated adjacent the first-named bed, and devices for drawing the material over said edge and acting upon it against the hinged bed, substantially as described.

4. In a fiber-separating machine the combination of feed-rollers, a splitting device, two working beds each conformed to one of the feed-rollers, two reversely-placed hinged working beds adjacent the first-named working beds, and devices to coact with the latter beds and draw the fiber of the split material over the several beds and unite it in a single body, substantially as described.

5. In a fiber-separating machine, the combination of two endless belts each comprising alternately-arranged scraping-blades and circumferentially-grooved bars adapted to act

oppositely on the fiber, the adjacent surfaces of the oppositely-situated blades and bars being in the same plane whereby the blades scrape the fiber and press it out into the
5 grooves of the bars separating it longitudinally, substantially as described.

6. In a fiber-separating machine, the combination of a pair of rollers adapted to feed material, a splitting-blade, springs to hold
10 the blade in a yielding manner, scutching de-

vices, and a washing-tank to receive the fiber directly from said devices.

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

SAMUEL BENJAMIN ALLISON.

Witnesses:

E. W. TALEN,
JAS. E. O'DONNELL,
H. J. MONARCH.