

No. 657,023.

Patented Aug. 28, 1900.

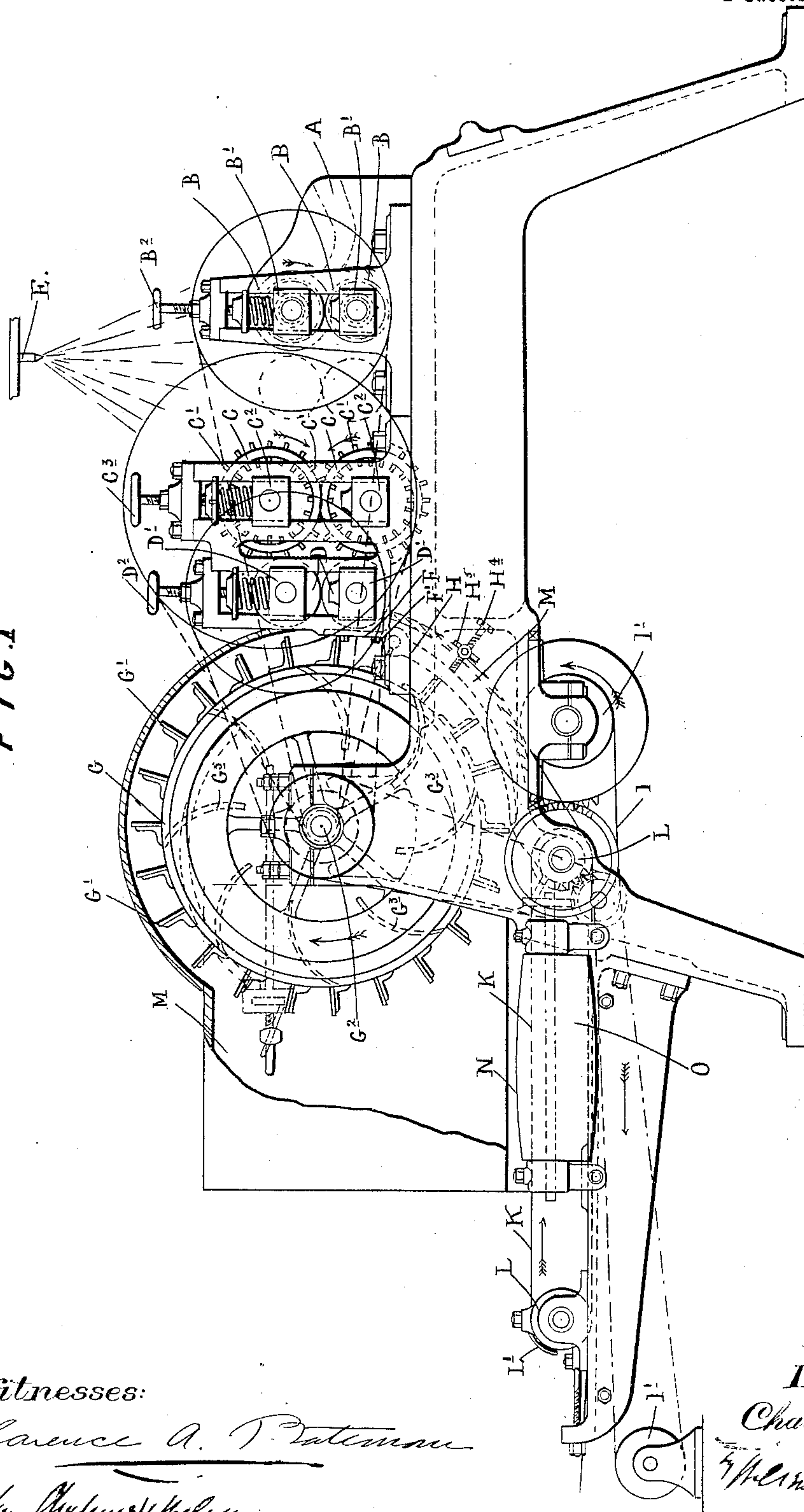
C. J. DEAR.
SCUTCHING MACHINE.

(Application filed Mar. 6, 1900.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1



Witnesses:

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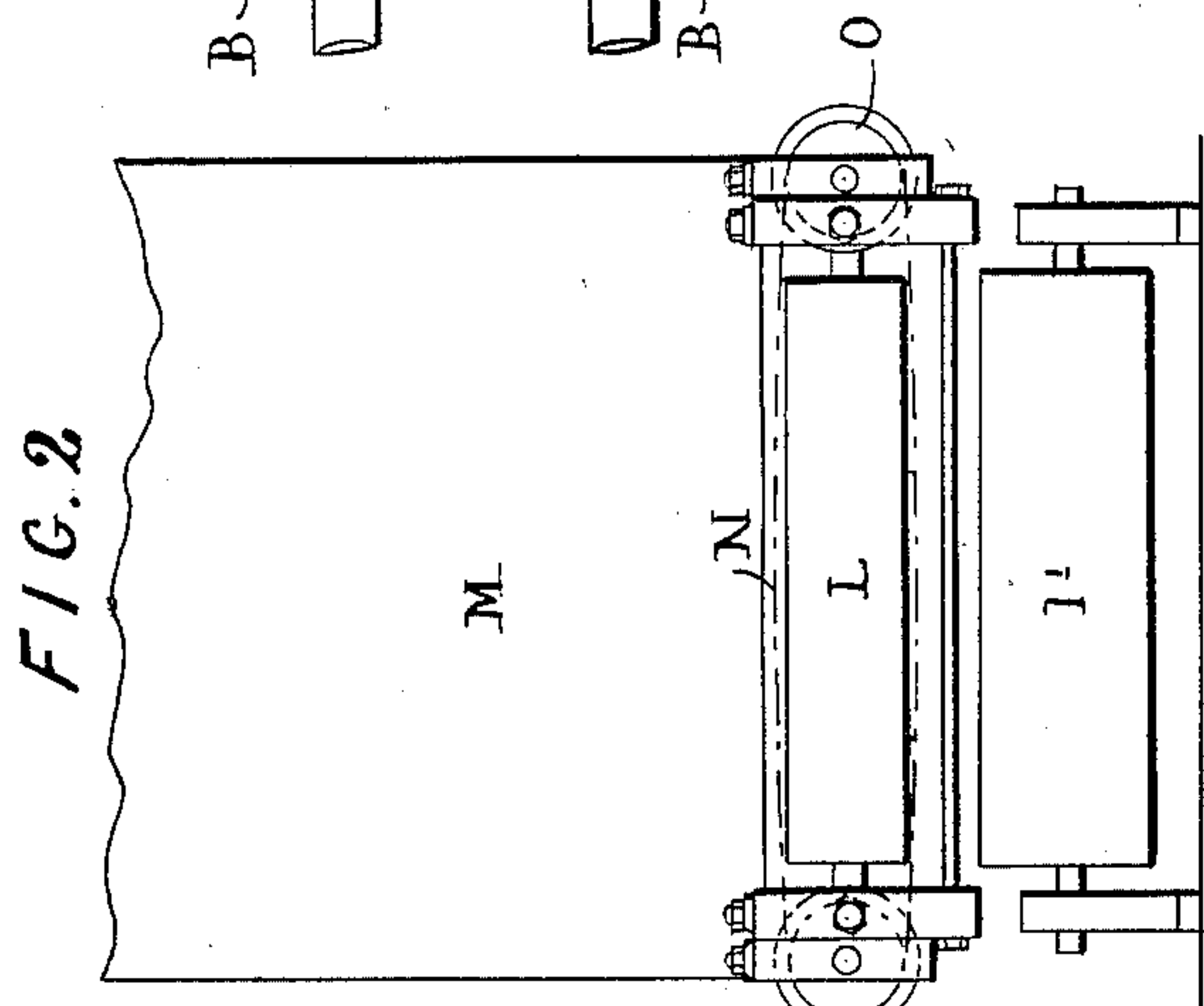
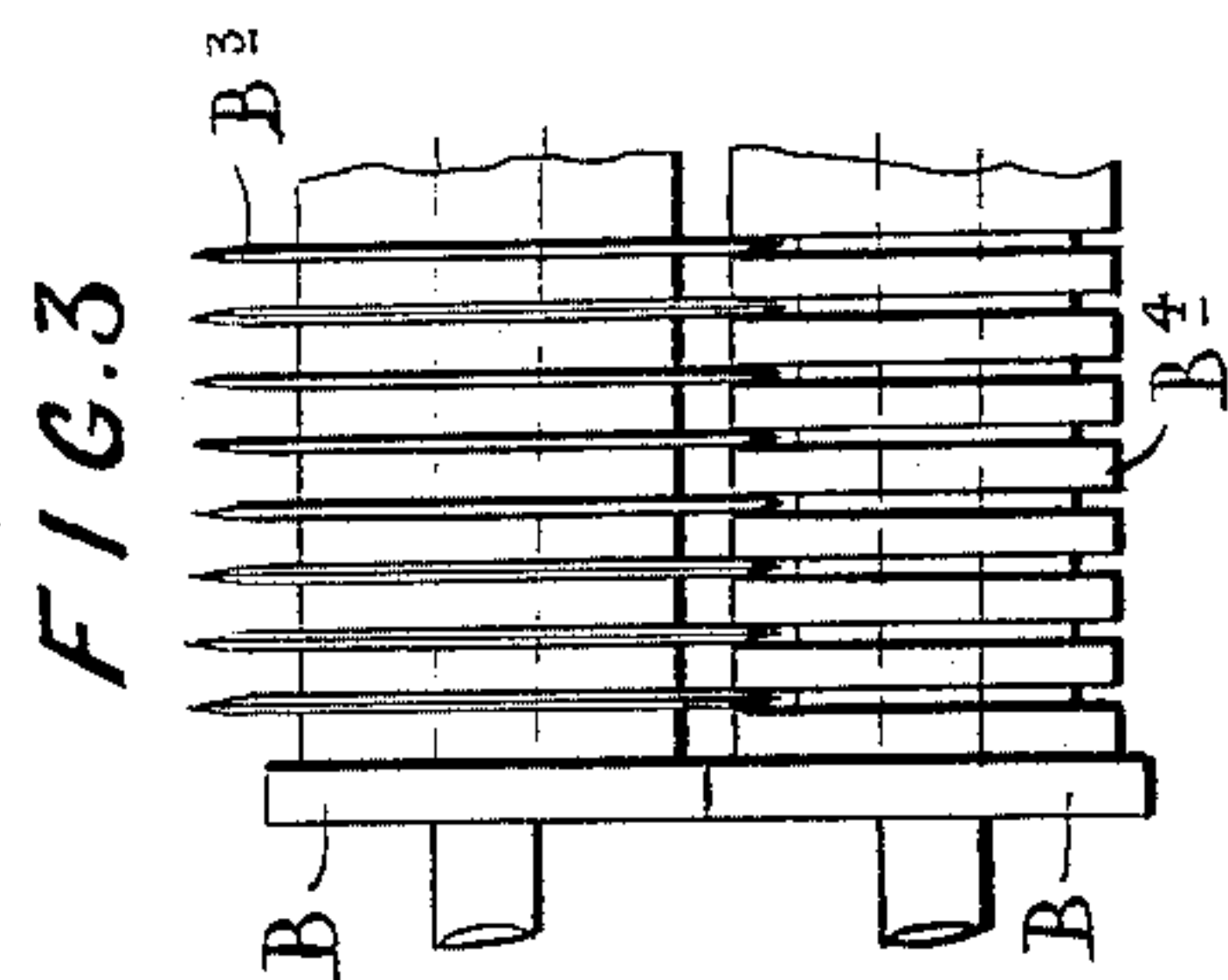
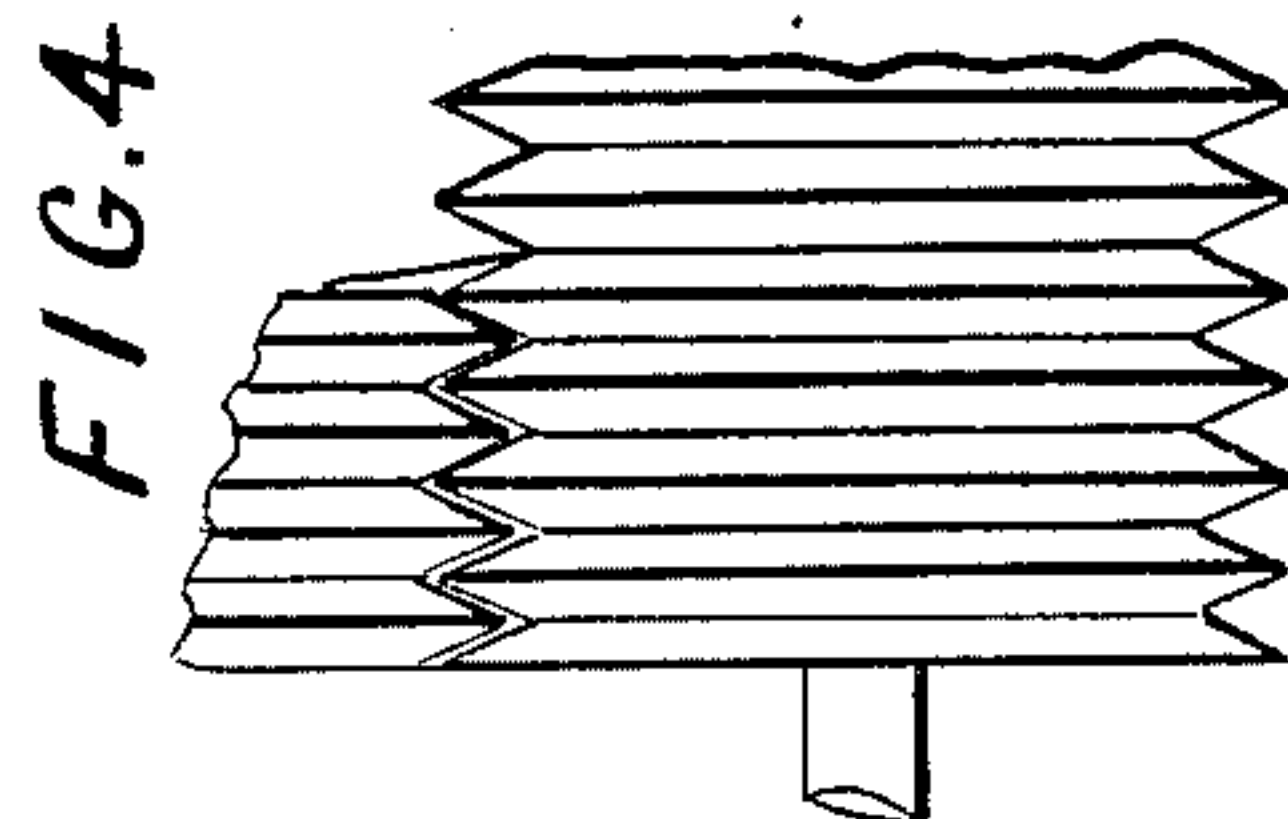
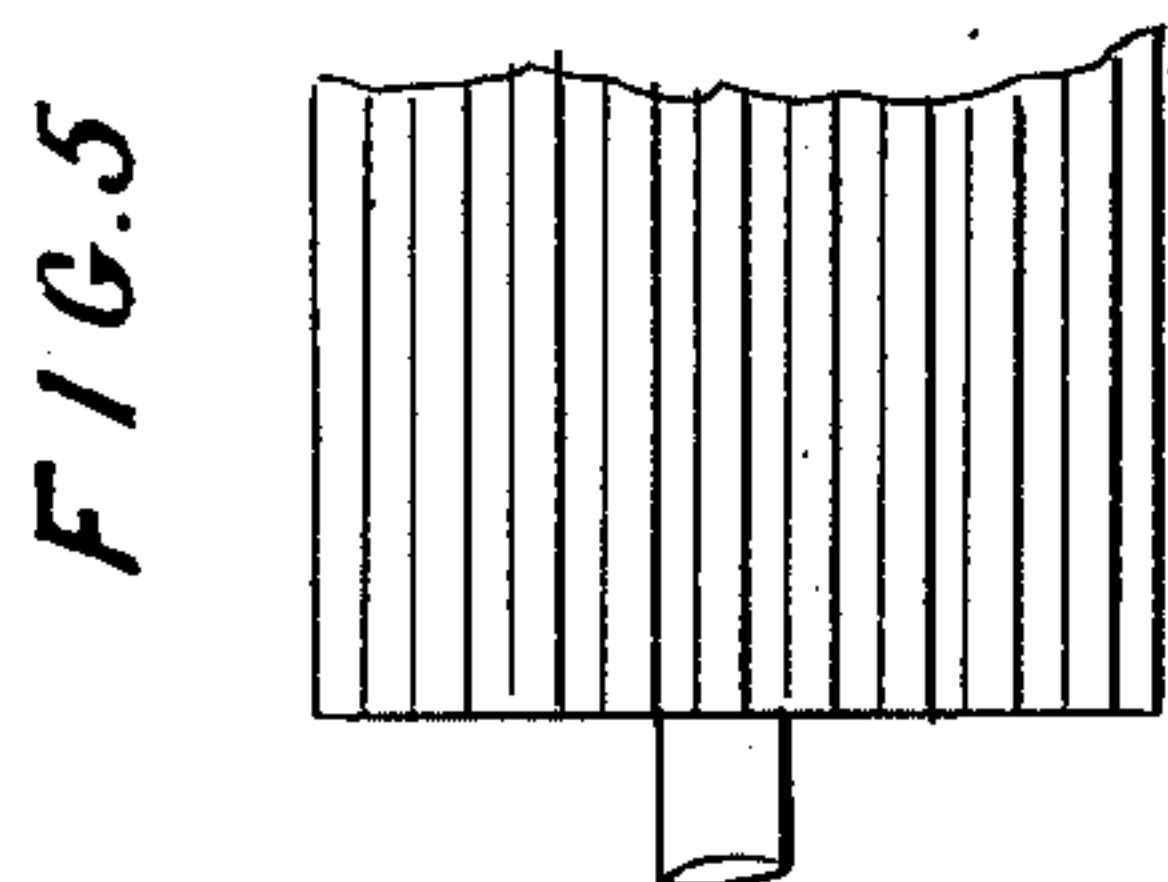
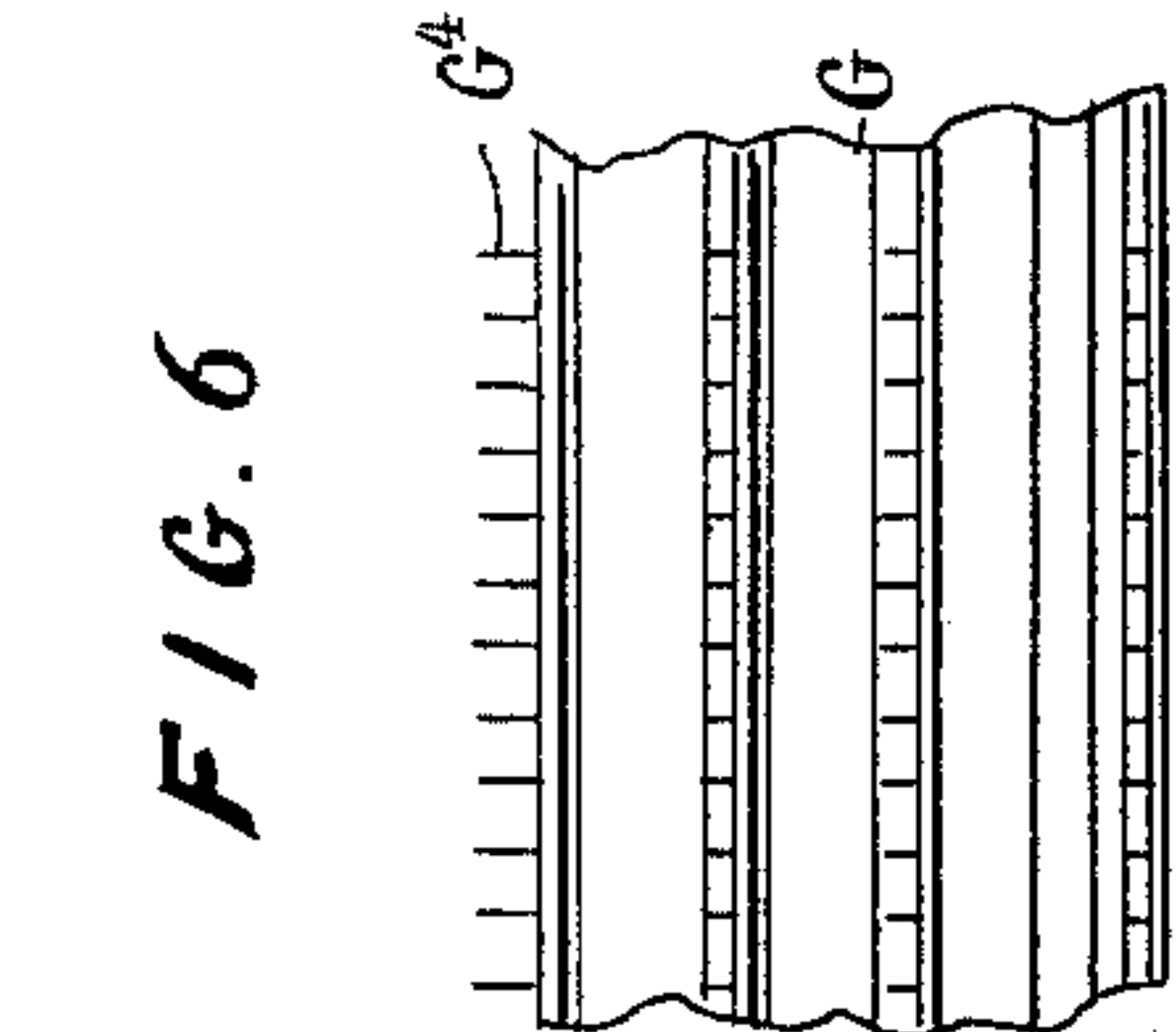
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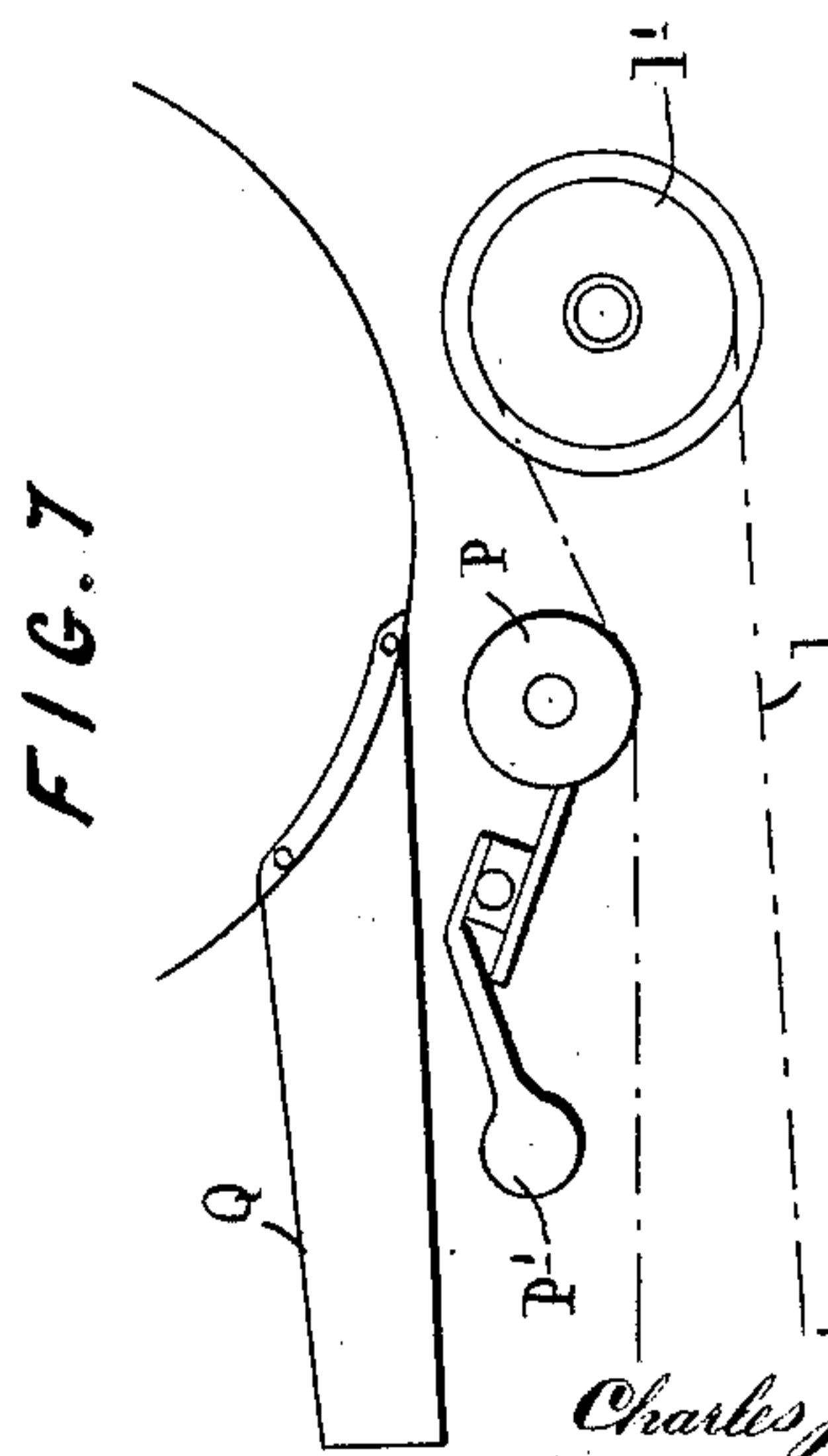
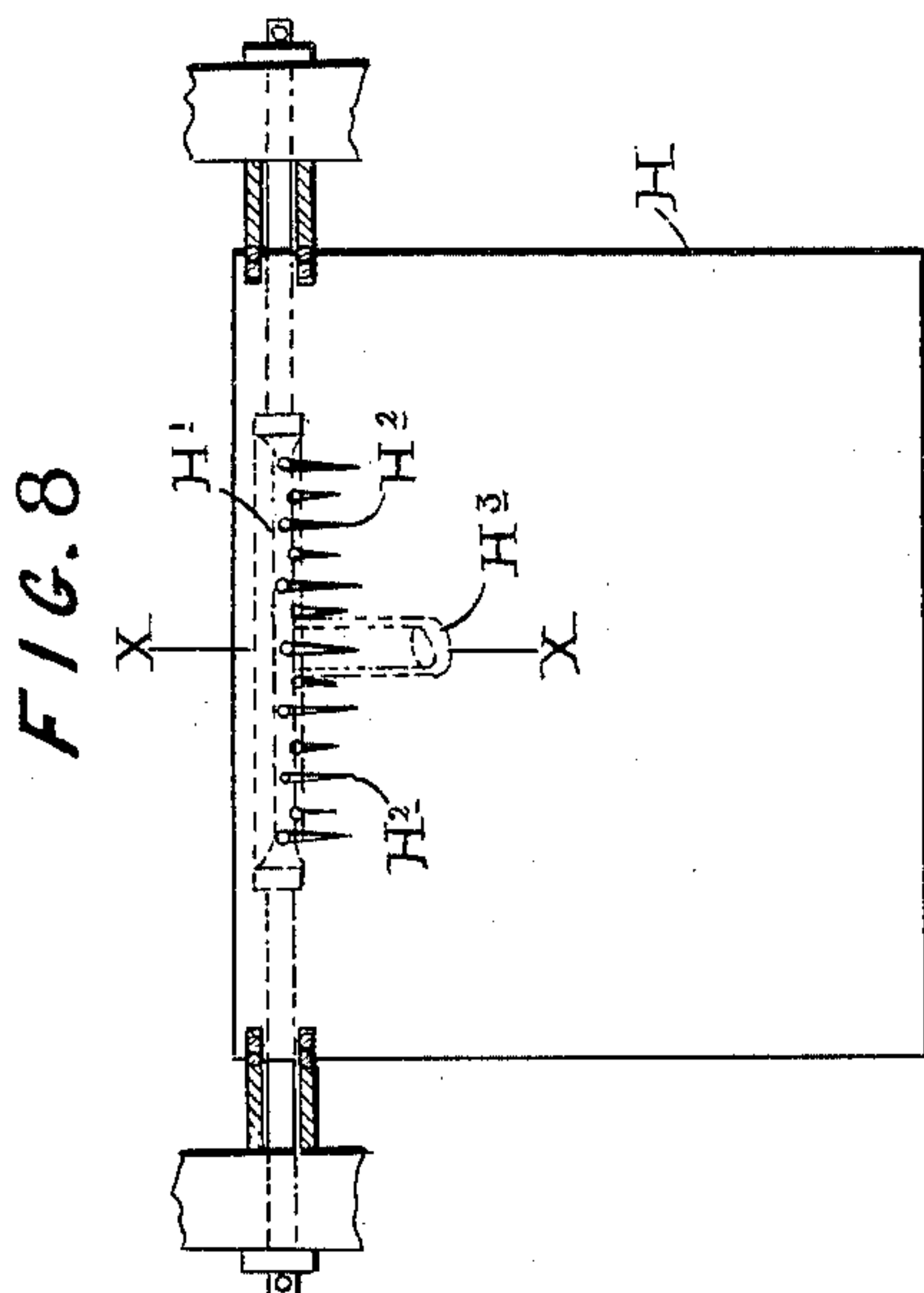
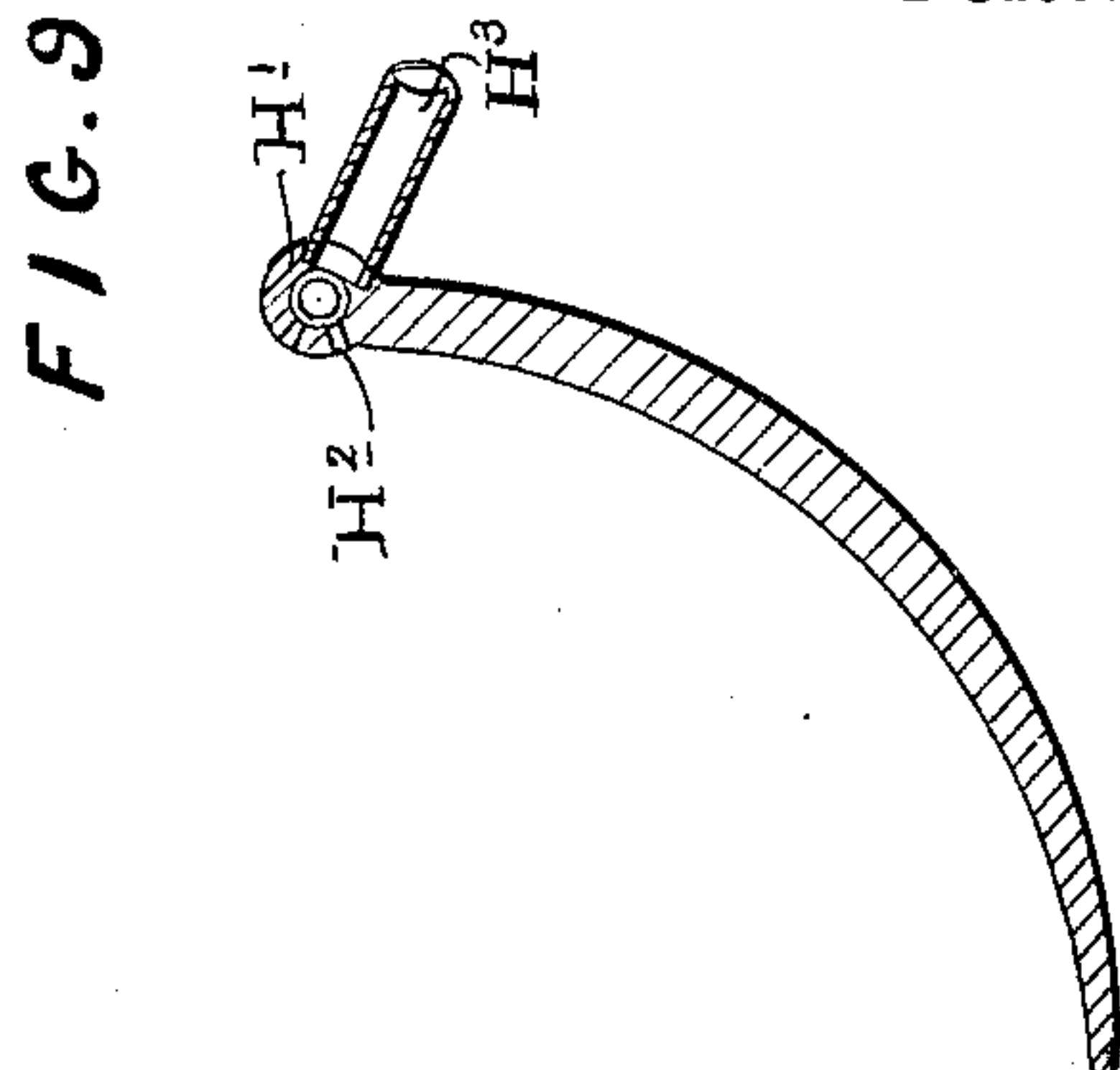
2 Sheets—Sheet 2.

(No Model.)



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UNITED STATES PATENT OFFICE.

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SCUTCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 657,023, dated August 28, 1900.

Application filed March 6, 1900. Serial No. 7,554. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. DEAR, a subject of the Queen of Great Britain, residing at Westminster, London, England, have invented certain new and useful Improvements in Scutching-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 which it appertains to make and use the same.

This invention relates to improvements in the manufacture of hemp, ramie, and other fibers, and has for its object efficient and simple machinery which is not liable to clog and whereby the hemp, ramie, or other fibrous material is decorticated and cleansed. The pith, bark, gum, and impurities are removed without any motion of the machinery or fiber in a reverse direction, and the fiber is finally delivered cleaned, straight, and untangled from the machine, the pith, wood, and refuse also being collected.

According to my invention I feed the raw fibrous material either through a curved chute or hopper or direct to a pair of decortivating-rollers, which may be either smooth, grooved, fluted, or furnished with knives, according to the nature of the material to be treated. The fibrous material is next passed through a pair of bladed or bottomless rollers which rotate more rapidly than the first-mentioned rollers. The fibrous material is next passed to a pair of adjustable fluted gripping and crushing rollers which travel faster than the bladed or bottomless rollers. A spray or douche of water may be caused to play on the fibrous material while being passed through the aforesaid rollers. The fibrous material is next presented over a breaking-anvil to a scutching or beating drum. The scutching or beating drum revolves faster than the gripping and crushing rollers and consists of end disks having central openings and connected by bars or rods, so as to form an open drum, which latter is mounted so as to rotate on a suitable shaft or spindle. Fan-blades may be mounted on the axle of the drum for the purpose of creating a centrifugal draft between the beaters as the drum revolves, in which case there is an opening around the axis of the drum. The bars or rods are of any suitable form in cross-section and con-

stitute the cutting or scutching blades or beaters. Pins may be set on or alternately between the bars in order to form a species of comb. With this drum liability to clog is reduced, all the particles of bark or other refuse falling clear. The fibrous material passes between this scutching-drum and an apron, preferably of steel, hinged to the bed-plate and adjustable at will, so as to increase or reduce the space between itself and the beaters of the scutching-drum, whereby the action of the drum on the fiber may be regulated. This apron may be perforated and inclosed in a chamber. Water is run or forced through the perforations in this apron for the more thorough removal of the particles of bark and pellicle, or air-pressure may be substituted for such water-pressure. This scutching-drum is incased in a chamber having three sides thereof closed, the top partly closed, and the bottom open. Below this chamber a chute is attached for the purpose of carrying away all particles of pith or other refuse from the drum. A transverse endless traveling band for carrying away refuse can also be used situated below the open bottom of this chamber. The fiber is conveyed away from the scutching-drum between two endless traveling bands which move at different rates of speed for the purpose of removing any adhering particles of bark by friction.

In order that my invention may be clearly understood and readily carried into effect I will proceed to describe the same more fully with reference to the accompanying drawings, in which—

Figure 1 is a part-sectional side elevation. Fig. 2 is an elevation of the scutching-drum end of the apparatus. Fig. 3 is a plan, on an enlarged scale, of the decortivating-rollers. Figs. 4 and 5 show another form of decortivating-rollers. Fig. 6 is a plan view of a scutching-drum provided with teeth forming a comb. Fig. 7 shows arrangement of roller with scraper attached. Fig. 8 is a front view of the perforated apron. Fig. 9 is a cross-section on line *xx*, Fig. 8.

A is the curved hopper or chute.

BB are the decortivating-rollers, supported from the machine frame or bed in adjustable spring-bearings B' B'.

B² is a screw for adjusting the bearings B'

B'. By means of the screw B² the pressure between the rollers B B may be regulated, and the said rollers are enabled to be interchanged or replaced, if required, or in some cases an additional pair may be used, as shown by dotted lines. According to the nature of the fibrous material to be treated the rollers B may be smooth or grooved or fluted or, as shown in Figs. 3, 4, and 5, one of them may be furnished with knives B³, while the other is provided with knives B⁴, the knives on one roller B engaging with corresponding recesses on the other roller B. Figs. 4 and 5 show rollers with blades of a triangular or V-shaped form, which blades may either run around the periphery of the rollers or parallel to the spindle and engage with one another.

C C are the bladed or bottomless rollers, composed of a number of transverse blades C', carried by end disks. The blades C' may have square or rounded edges, as required. The rollers C are supported from the machine frame or bed in adjustable bearings C² C². C³ is a screw for adjusting the bearings C² C². The rollers C C are adapted to travel faster than the rollers B B.

D D are the fluted gripping and crushing rollers, supported from the machine frame or bed in adjustable spring-bearings D' D'. D² is a screw for adjusting the bearings D' D'. The rollers D D travel faster than the rollers C C.

E is a nozzle for applying a spray or douche of water to assist in cleansing the fibrous material, if required.

F is an anvil removably attached to the machine frame or bed by screws F' F'.

G is a scutching or beating drum, which comprises transverse bars or beating-blades G', attached to the end disks mounted on a rotary spindle G². G³ represents fans or blades mounted on the spindle G² within the drum G and are for the purpose of drawing in air through suitable openings in the ends of the drum G, around the axle, and creating a centrifugal draft of air out through the openings in the periphery of the drum G. The beating-blades G' may be faced with wood, leather, felt, rubber, or other suitable material, according to the requirements for the kind of fiber to be treated. The drum G travels at a higher rate of speed than the rollers D D. The drum G may be provided with teeth, such as G⁴, Fig. 6, when it is required to form also a species of comb. The anvil F is arranged to reduce the distance between the rollers D and the drum G to a minimum and may be removed for "truing up" by removing the screws F'.

H is an apron, preferably of steel, which is hinged to the frame or bed of the machine.

H' is a chamber in the upper end of the apron H, and H² H² are perforations extending from the chamber H' to the face of the apron.

H³ is a pipe for conveying water or air un-

der pressure to the chamber H', or said pipe may be connected to a fan or other means for exhausting air from the chamber H'.

H⁴ is a screw which passes through a screw-threaded projection or lug H⁵ on the face of the machine and bears upon the under side of the apron H. By turning the screw H⁴ the position of the apron H with reference to the drum G may be adjusted and the action of said drum on the fiber thereby regulated.

I is an endless band, which may be of canvas or of wire, and is carried by rollers I' I'. K is an endless band carried by rollers L L. Each of the bands I and K travels at a different rate of speed, and these bands are adapted to revolve inwardly or toward one another in the direction indicated by the arrows.

L' is a shield or guard for preventing the fiber wrapping around the roller L at the delivery end of the band K.

The endless traveling band K may in some cases be removed and the scraper P, as shown at Fig. 7, used. This said scraper is also provided with a guard P' to prevent the fiber wrapping around the scraper P.

M is a chamber which is supported from the machine-frame and the bottom of which is open.

N is an endless transverse traveling band carried by rollers O.

When treating some kinds of fibrous material, the rollers B may be omitted. The rollers C may in some cases be corrugated instead of bladed or may also be omitted.

The rollers B, C, and D are actuated by band-and-pulley gear from the shaft G². The rollers I', L, and O are operated by tooth-gearing, which is actuated by belt-and-pulley gear from the shaft G². The shaft G² is caused to rotate by suitable means from a convenient source of power.

The fibrous material is fed through the curved hopper A, where it is bent, to the decorticating-rollers B, which further bend, break, or split up the fibrous stems or stalks as may be required, according to the fiber to be treated, so as to loosen their particles and facilitate the herein-described after treatment. The material then passes through the rollers C, which break up the wood, fleshy matter, and pellicle of the fibrous stalks or stems. The fibrous material then passes through the rollers D, which draw it through the rollers C, and thereby loosen and crush the already-broken wood and pellicle. The rollers C should be so arranged that they do not exert too great a retarding force upon the fibrous material. The fibrous material is next conducted over the anvil F to the scutching-drum G and passes between the drum G and apron H. The friction caused by the drum G and apron H upon the fiber, which is retarded by the less-rapidly-revolving rollers D, completes the debarking and separation of the refuse from the said fiber under treatment. The water, gas,

or air passing through the perforations H² in the apron H assists in the cleansing of the fiber. The refuse thrown out from between the beaters of the drum G is collected in the chamber M, and may be carried away by the endless band N and thereby prevented from again mixing with the fiber or clogging the apparatus, or it may be thrown out through the chute Q. From the apron H the fiber passes between either the roller with scraper P attached and the coacting belt or the endless traveling bands I and K, from which it is delivered in a straight and clean condition ready for degumming or other treatment.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine of the character described, the combination of a curved hopper for primarily receiving and bending the fiber, pairs of rollers arranged in succession to receive the fiber from the hopper, each pair revolving faster than the preceding pair, and a scutching-drum for beating the fiber after it has passed through the said rollers, substantially as described.

2. In a machine of the character described, the combination of a curved hopper for primarily receiving and bending the fiber, pairs of rollers arranged in succession to receive the fiber from the hopper, each pair revolving faster than the preceding pair, a scutching-drum for beating the fiber after it has passed through the said rollers, and a curved apron arranged near the periphery of the said drum, substantially as described.

3. In a machine of the character described, the combination of a curved hopper for pri-

marily receiving and bending the fiber, pairs of rollers arranged in succession to receive the fiber from the hopper, each pair revolving faster than the preceding pair, a scutching-drum for beating the fiber after it has passed through the said rollers, a curved apron arranged near the periphery of the said drum, a chamber in the said apron, and vents communicating with the said chamber for the passage of fluid therefrom, substantially as described.

4. In a machine of the character described, the combination of a curved hopper for primarily receiving and bending the fiber, pairs of rollers arranged in succession to receive the fiber from the hopper, each pair revolving faster than the preceding pair, a scutching-drum for beating the fiber after it has passed through the said rollers, fans within the said scutching-drum for creating a centrifugal draft, and a curved apron arranged near the periphery of said drum, substantially as described.

5. In a machine of the character described, the combination with pairs of rollers arranged in succession, each pair revolving faster than the preceding pair, a scutching-drum for beating the fiber as it passes from the said rollers, and fans within said scutching-drum for creating a centrifugal draft of air; of a band conveyer to receive and carry off the refuse, and a pair of conveyers arranged to travel at different rates of speed to receive the fiber; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES J. DEAR.

Witnesses:

PERCY E. MATTOCKS,
WM. O. BROWN.