

(No Model.)

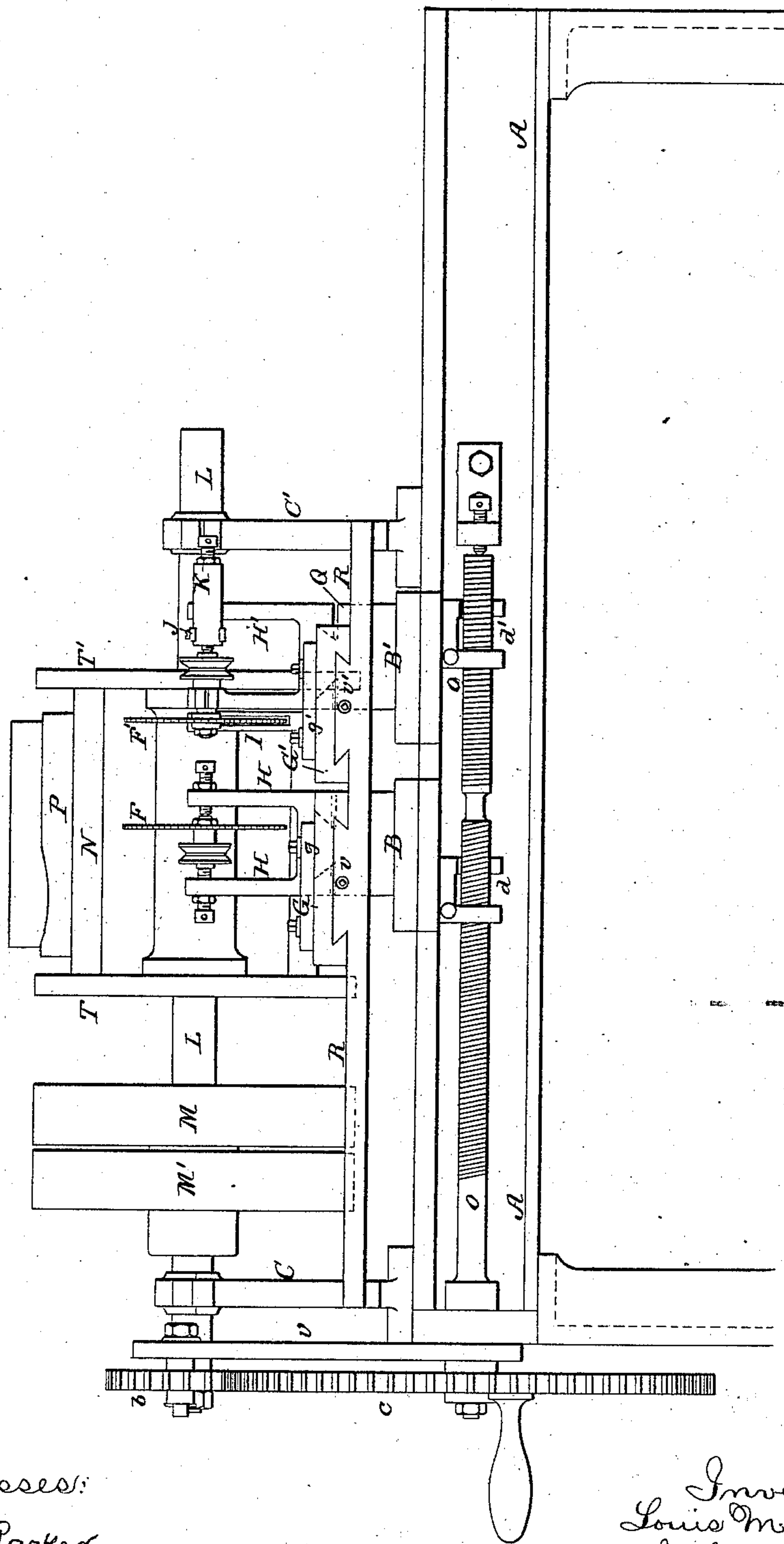
3 Sheets—Sheet 1.

L. M. CHORIER.
COMB MAKING MACHINE.

No. 311,061.

Patented Jan. 20, 1885.

FIG. 1.



Witnesses:
John E. Parker
Harry Drury

Inventor:
Louis M. Chorier
by his Attorneys
Horsman and Co.

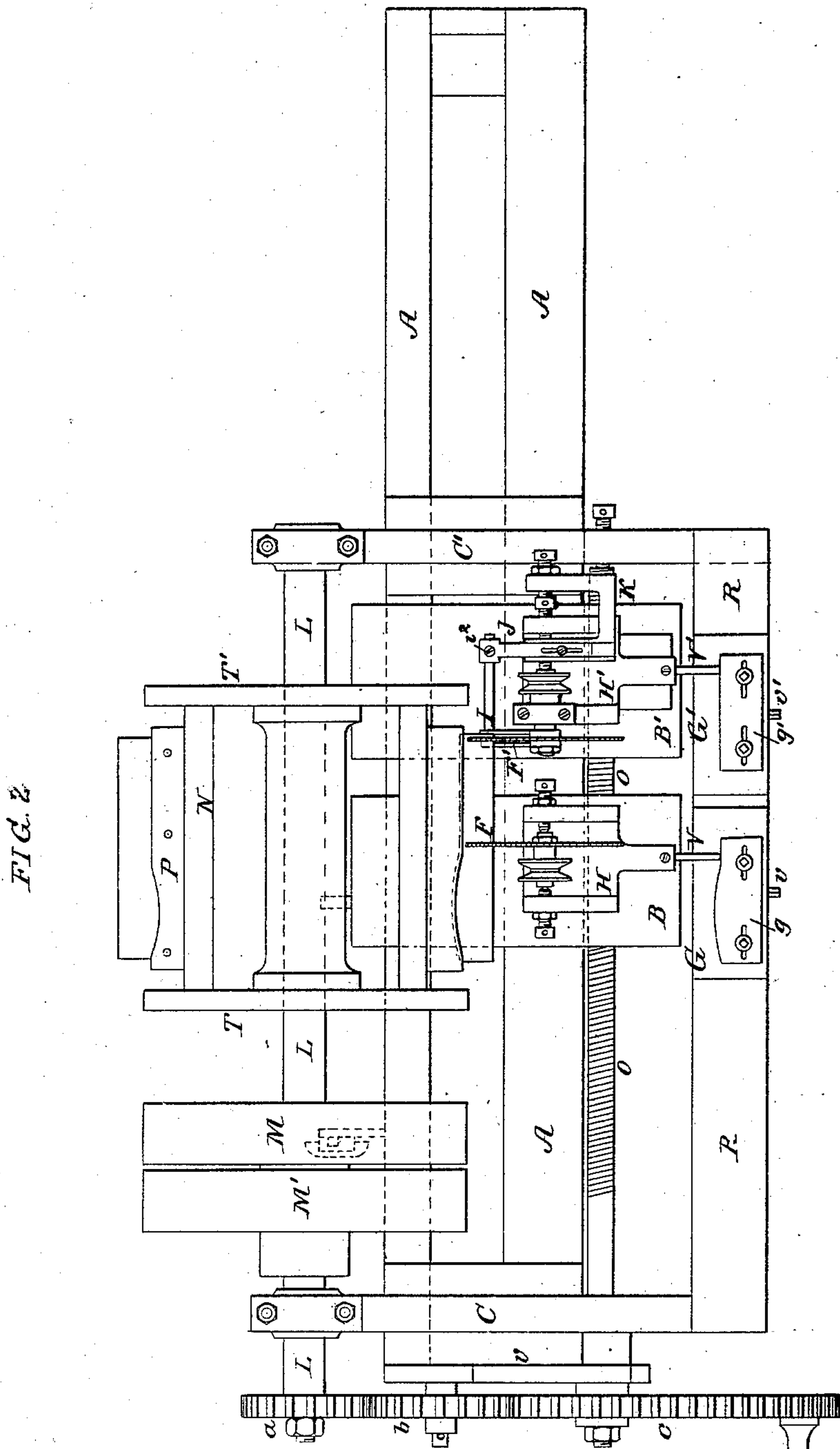
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3 Sheets—Sheet 2.

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COMB MAKING MACHINE.

No. 311,061.

Patented Jan. 20, 1885.



Witnesses:
John E. Parker
Harry Drury

Inventor:
Lomborier
by his Attys:
Horton and Leno

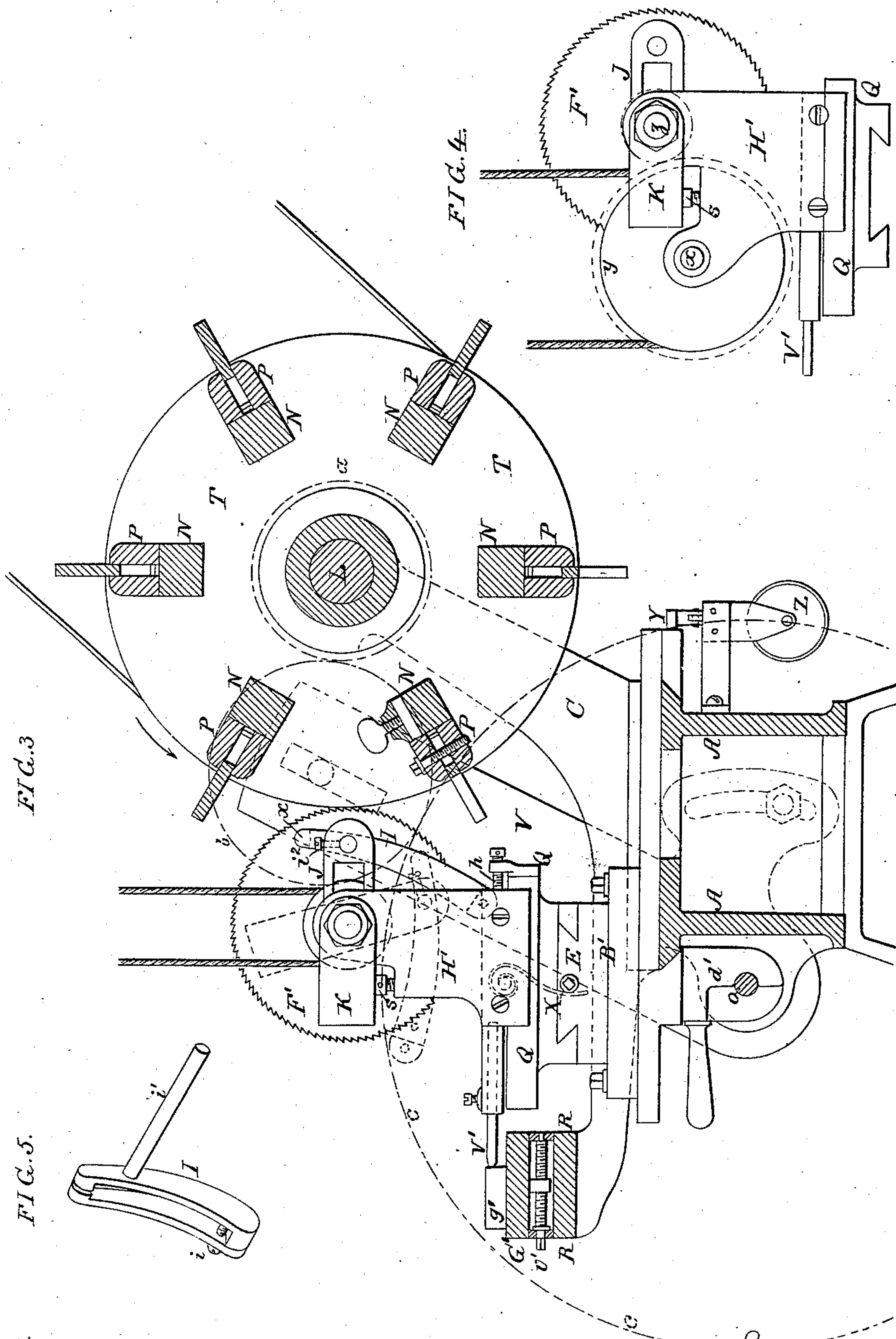
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3 Sheets—Sheet 3.

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No. 311,061.

Patented Jan. 20, 1885.



Witnesses:
John E. Parker
Harry Drury

Inventor:
Louis M. Churier
by his Attorneys
Horton and Co

UNITED STATES PATENT OFFICE.

LOUIS MARIE CHORIER, OF PARIS, FRANCE.

COMB-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 311,061, dated January 20, 1885.

Application filed July 31, 1884. (No model.) Patented in France June 20, 1884, No. 162,864; in Belgium June 23, 1884, No. 65,558; in England June 23, 1884, No. 9,541, and in Germany July 1, 1884, No. 30,068.

To all whom it may concern:

Be it known that I, LOUIS MARIE CHORIER, a citizen of the Republic of France, and residing in Paris, France, have invented an Improved Apparatus for Cutting the Teeth of Combs, (for which I have obtained a French Patent, No. 162,864, dated June 20, 1884; British Patent No. 9,541, dated June 28, 1884; German Patent No. 30,068, dated July 1, 1884, and Belgian Patent No. 65,558, dated June 23, 1884,) of which the following is a specification.

My present invention consists of certain improvements on the machine for which I applied for Letters Patent of the United States, December 10, 1883, Serial No. 114,085, the main object of this invention being to so construct the machine that both the large and small teeth of the comb may be cut at one and the same time and with equal precision and regularity.

In the accompanying drawings, Figure 1 is a front view of the machine. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section drawn to a larger scale through the comb-carrying drum and the cutting apparatus. Fig. 4 is a detached view of a modified form of gear for driving the cutters, and Fig. 5 is a perspective view of the saw-guide detached.

In this machine only one comb-carrying drum, T T', is shown; but in connection with this drum are employed two rotary cutters, F and F', mounted on head-stocks H and H' on carriages B B', which are traversed longitudinally on the bed A of the machine at relatively different speeds, to cut the teeth of the two halves of each comb of the required large and small size. The drum T T' is mounted on a shaft, L, having bearings in the standards C C' on the frame A of the machine, and driven by a belt passing over fast and loose pulleys M M'. The head-stocks H and H' are mounted on two carriages B B', which are adapted to traverse longitudinally on the bed of the machine under the action of the differential feed-screw O, which receives motion from the shaft L through the gear-wheels a, b, and c. The first, a, of these wheels can be changed to vary the speed of the feed-screw, the wheel b being mounted in bearings in an adjustable arm, v,

for this purpose. The feed-screw O has two separate threaded portions, to one of which is adapted a threaded grip, d, on the carriage B, while a similar grip, d', on the carriage B', is adapted to the other. These two portions of the shaft have different threads to give different rates of speed to the two carriages. Thus in the present instance the portion controlling the carriage B has three threads, while the portion controlling B' has only one thread, so that the carriage B with the cutter F will travel three times as fast as the carriage B' with the cutter F'. Consequently the teeth formed by the cutter F will be three times as thick as those formed by the cutter F'. Each head-stock H H' is adapted to dovetailed guides in a piece, Q, so as to be movable toward or from the comb-drum, and the piece Q in turn is adapted to guides on the carriage B or B' at right angles to the first, and adjustable on the carriage by means of a screw, E, Fig. 3. The standards C C' have portions projecting to the front and carrying a longitudinal bar, R, on which are mounted on dovetailed guides the slides G G', provided with adjustable tem-
plets g g'. The slides G G' can be adjusted toward and from the drum T T' by screws v v', Figs. 1 and 3.

Against the edges of the templets g g' bear the pins V V' on the corresponding head-stocks, these pins being kept up in contact with the templets by means of a coiled spring, X, Fig. 3, the extent of movement toward the comb-drum being limited by a set-screw, h.

The cutter F' is finer than the cutter F, and consequently requires to be accurately guided. For this purpose I make use of an adjustable guide, which is an improvement on the guide illustrated in my former application above referred to.

The guide-piece proper consists of a pair of spring jaws, I, Fig. 5, to embrace the blade of the saw, and adjustable by a screw, i, which spring-jaws have an arm, i', adapted to an opening in an arm, J, and secured, after adjustment, by a set-screw, i², Figs. 2 and 3. This arm J is adapted to be adjustably secured in a groove (at right angles to the arm i') in a piece, K, which is pivoted on the head-stock on the same center as the saw and forms a

counterpoise for the guide J, the extent of motion being limited by an adjustable back-stop, s, Fig. 3.

The counterpoise K and guide or guard I carried thereby are normally in the positions shown by the full lines in Fig. 3, but as soon as the comb-blank, moving in the direction of the arrow, Fig. 3, comes into contact with the upper end of the saw-guide the blank pushes the guide before it, causing the piece K and guide to turn on the pivoting center until they reach the positions indicated by dotted lines, when the comb-blank will slip past the guide and allow the latter, under the influence of the counterpoise, to return to its first position, ready for the next blank. In this way the saw-blade is always steadied and guided just at the point where it is doing its work up to the time the comb-blank leaves the saw-blade, and the guide can be readily adjusted to the most advantageous position with relation to the depth of cut.

The comb-carrying drum mounted on the shaft L is composed of disks T T', kept apart, as required, by stretchers N, carrying gripping-plates P, to hold the small plates of horn or other material to form the combs.

The axis of each saw F F' is provided with a grooved pulley to receive a driving cord or belt, Figs. 1 and 2; or, if preferred, the belt-pulley may be mounted on a separate shaft, x, as shown in Fig. 4, and impart motion to the cutter F F' through the medium of a spur and pinion, y z.

On the rear side of the carriage B is a projecting finger, Y, Figs. 2 and 3, which, when the carriages have come to the end of their traverse and the teeth have been cut in all

the comb-blanks, will strike the upper end of the pivoted clapper of a gong or bell, Z, and so call the attention of the operator to stop the machine and prepare to cut a new set of blanks.

The number of drums and cutters and the number of comb-carriers on each drum may be varied to any desired extent without departing from my invention.

I claim as my invention—

1. In a machine for cutting the teeth of combs, the combination of a rotary comb-carrying drum, and traveling carriages supporting cutters alongside the drum, with differential feed mechanism engaging the carriages for automatically feeding them at different speeds, to cut teeth of different sizes, substantially as set forth.

2. The combination of the rotary comb-carrying drum, traveling carriages alongside the drum, and rotary cutters mounted thereon, with a differential feed-screw having different threads to feed the cutters longitudinally of the drum at different speeds, substantially as and for the purpose set forth.

3. The combination of the rotary comb-carrying drum and a rotary cutter or saw adjacent to said drum, to cut the teeth in the blanks, with a pivoted counterpoise, K, and a saw-guide, I, adjustably mounted thereon, substantially as described.

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

LOUIS MARIE CHORIER.

Witnesses:

LÉON FRANCKEN,
ROBT. M. HOOPER.