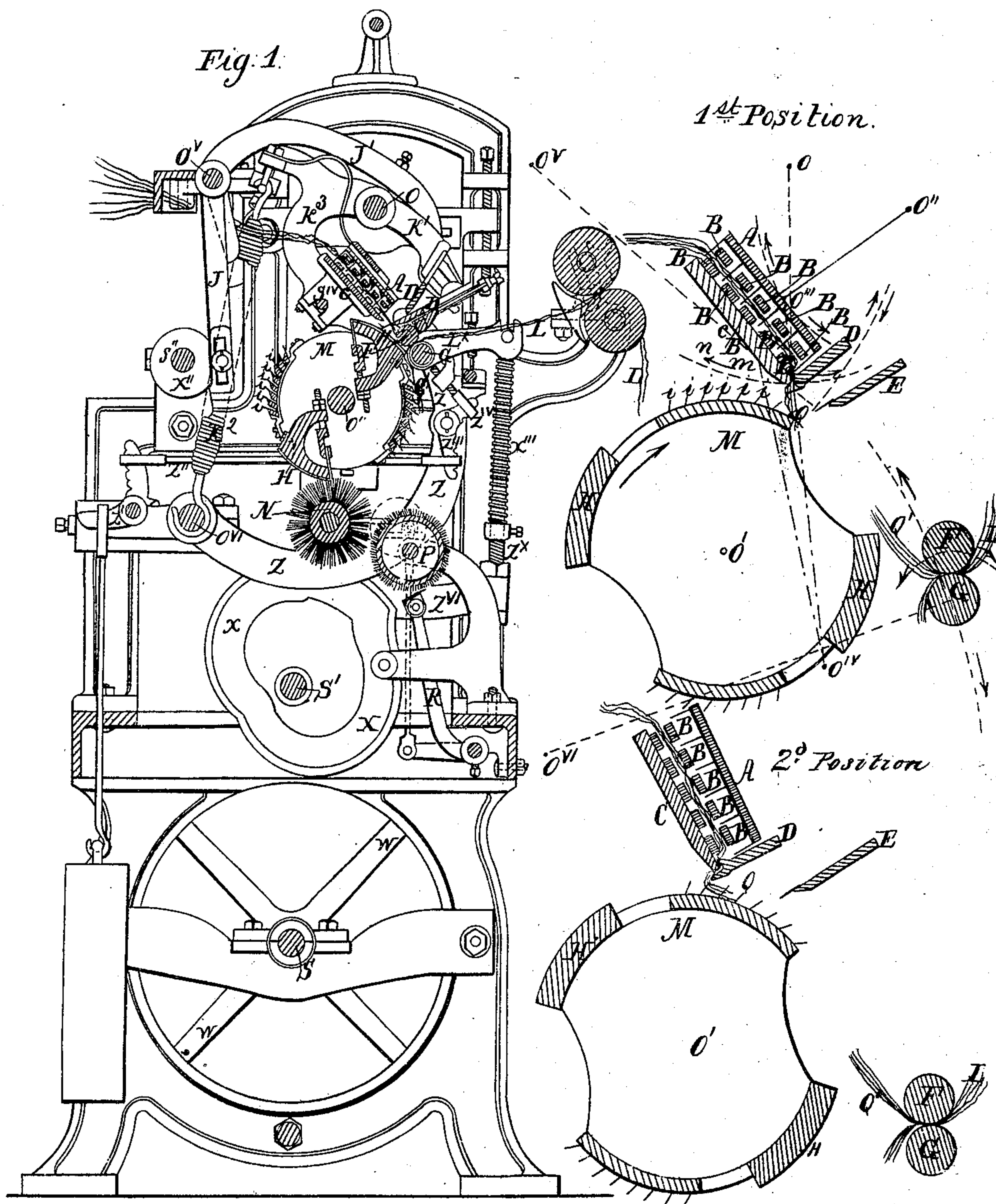


J. Heilmann,
Combing Machine.

N^o 10,289.

Patented Nov. 29, 1853.

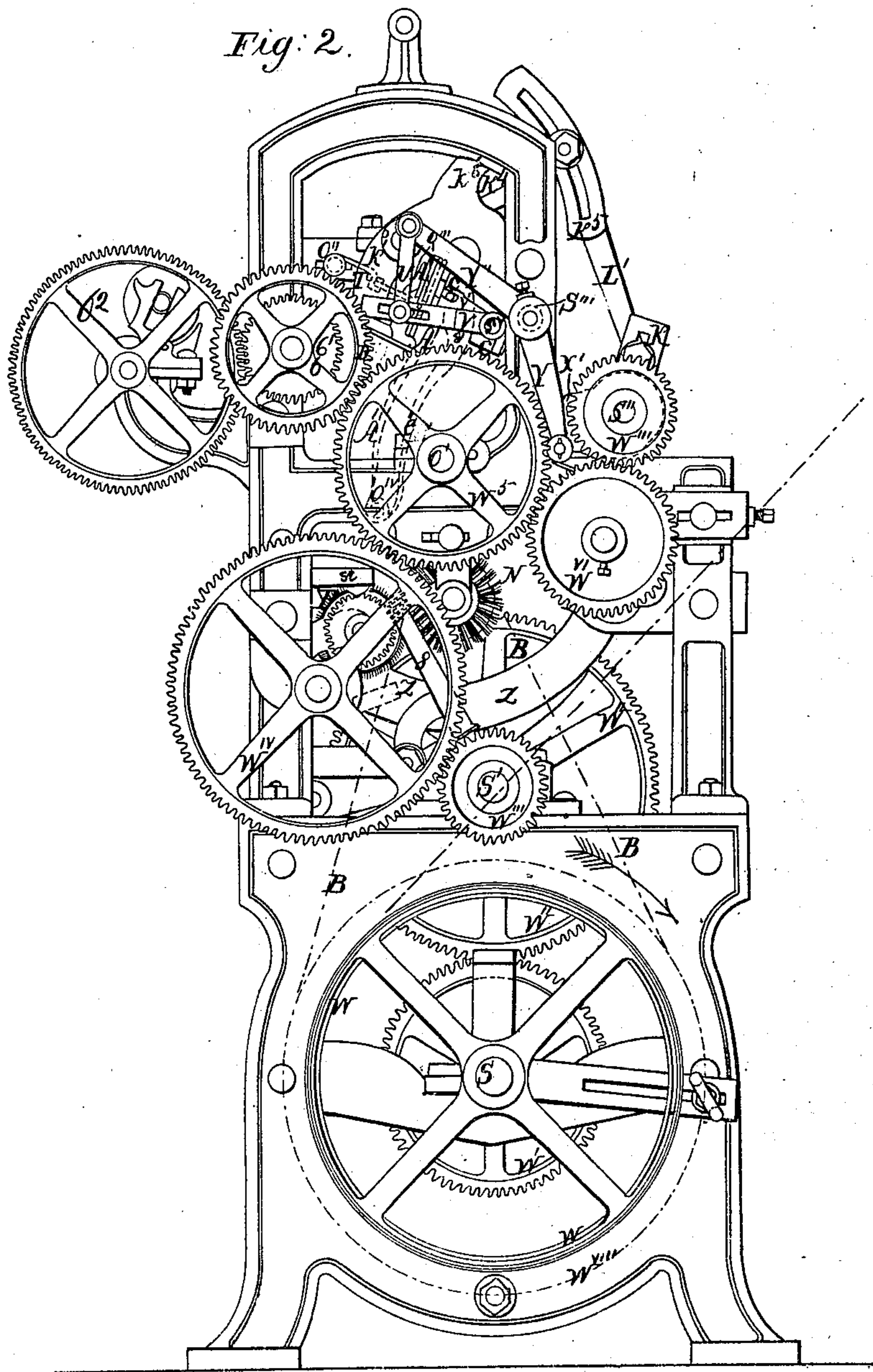


*J. Heilmann,
Combing Machine.*

N^o 10,289.

Patented Nov. 29, 1853.

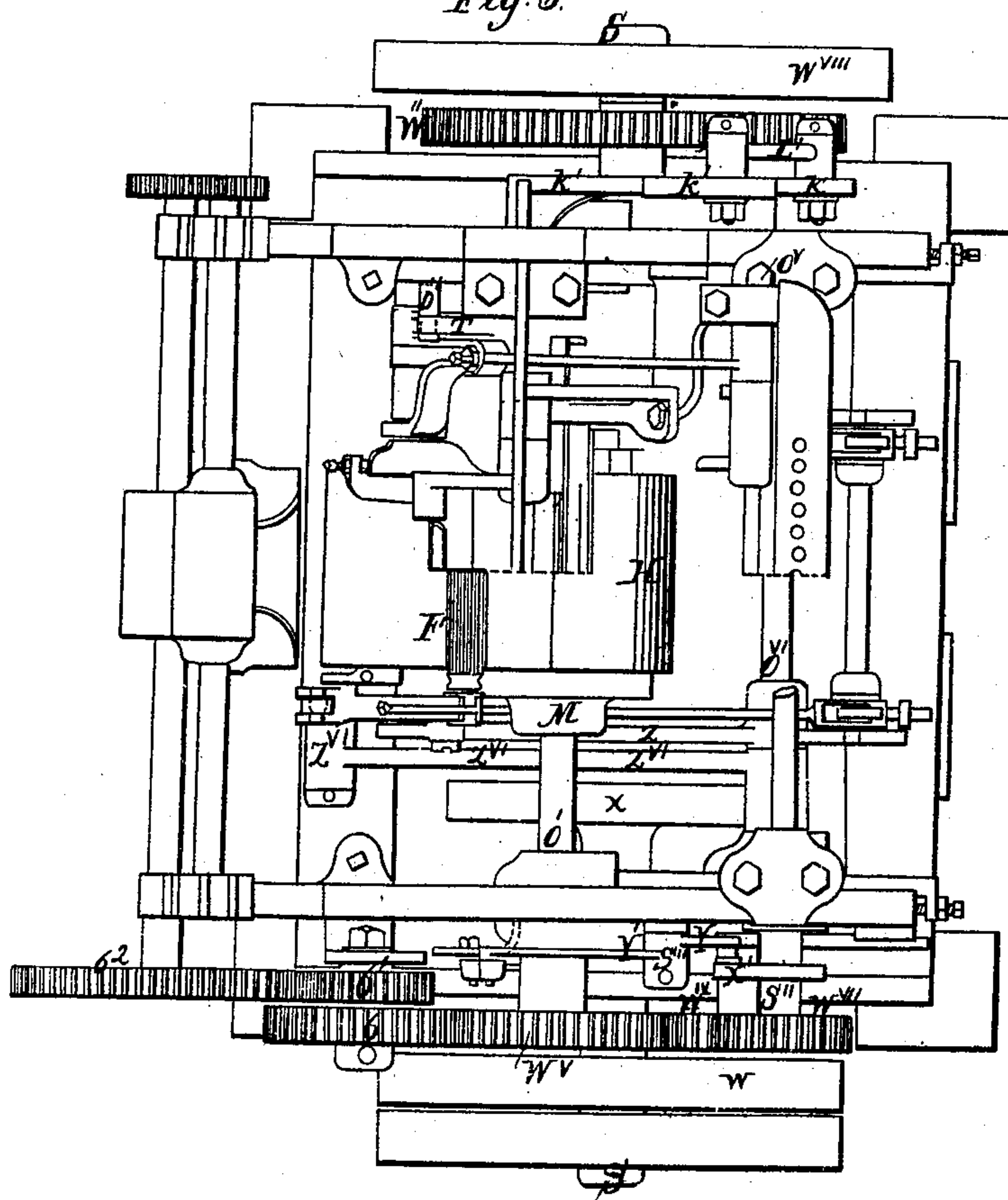
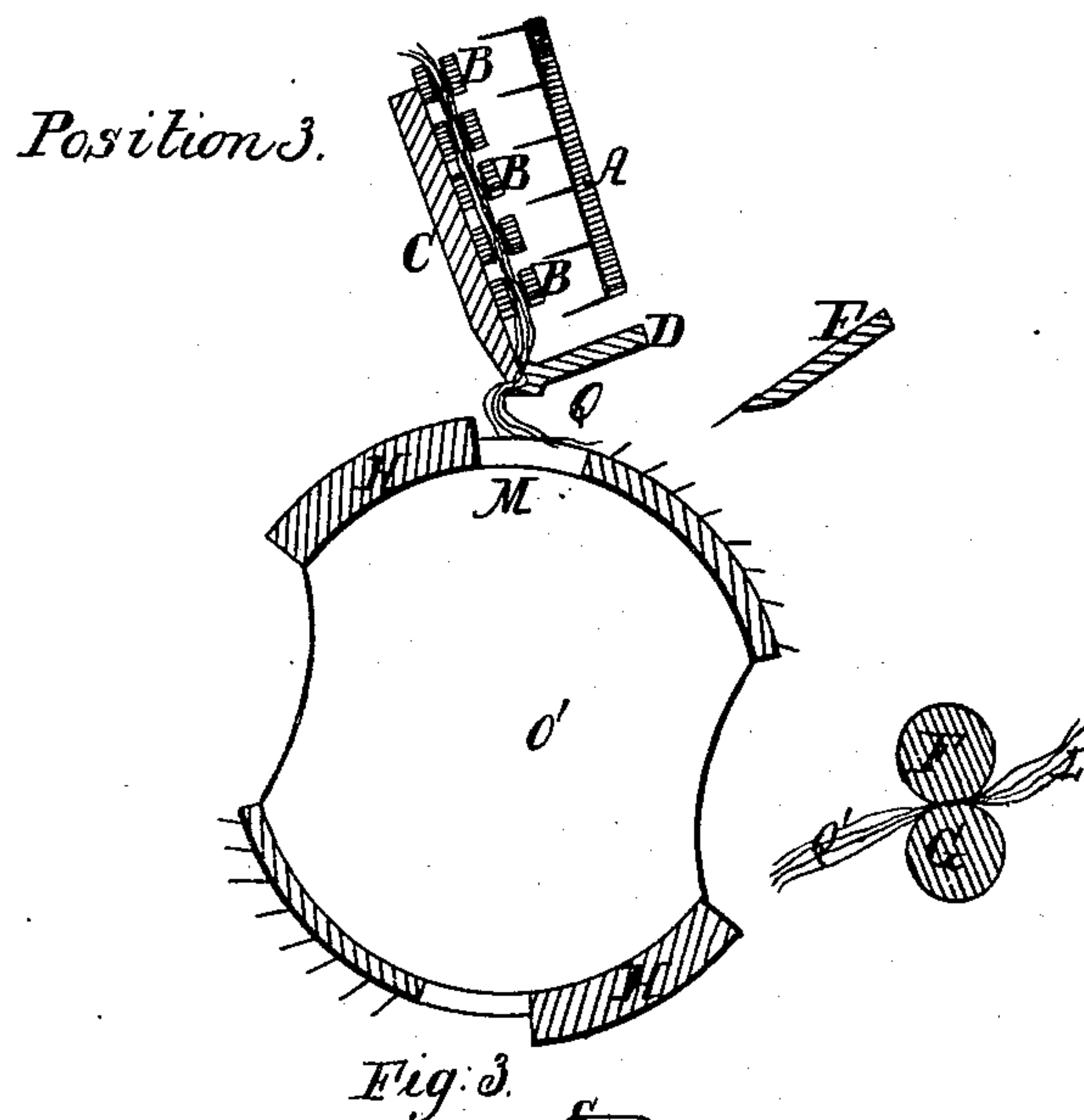
Fig: 2.



*J Heilmann,
Combing Machine.*

N^o 10,289.

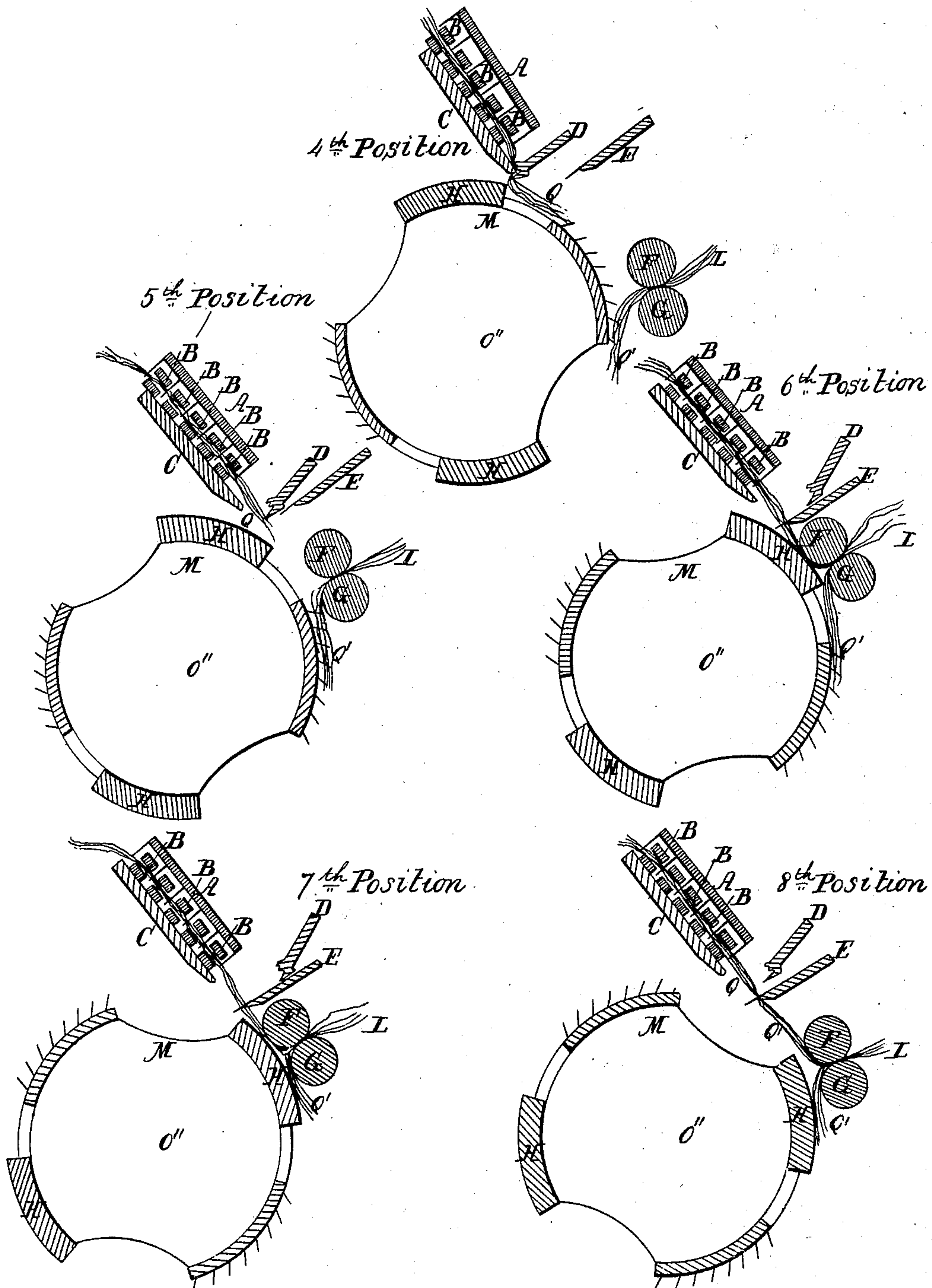
Patented Nov. 29, 1853.



*J. Heilmann,
Combing Machine.*

N^o 10,289.

Patented Nov. 29. 1853.



UNITED STATES PATENT OFFICE.

JOSHUA HEILMANN, OF FRANCE, ADMINISTRATOR OF JOSHUA HEILMANN.

COMBING FIBROUS MATERIALS.

Specification of Letters Patent No. 10,289, dated November 29, 1853.

To all whom it may concern:

Be it known that JOSHUA HEILMANN, of the Republic of France, did invent certain new and useful machinery for combing wool and other fibrous substances by removing therefrom all the short fibers and such foreign substances as may be mingled therewith; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had in the accompanying drawing, in which—

Plate I, shows the several views of the machine, and Plate II represents sections illustrating the progress of the wool through the machine, and the various positions of its parts.

To clearly understand the invention, it may be well to trace, first, the fiber through its various stages of progress, and then afterward follow out the parts of the machine by which their motions were made.

Commencing the operation at Plate II, position 1st, it will be observed that the wool, represented by red lines, lies along between two series of bars, B, B, placed sufficiently far apart to readily admit the sliver of wool between them; in this position there is a portion of the sliver hanging down beyond the plate or jaw C, upon which the bars B slide, as will hereafter appear; and the upper jaw D, being held down firmly in contact with jaw C, the sliver hanging beyond them is in position ready to be combed; this operation is effected by a series of teeth *i, i, i*, projecting from a large cylinder M, which revolves just below. When the teeth *i, i*, have removed all the foreign substances, as well as the short fibers, the cylinder M, continues around till it passes the position shown in No. 2, 3, 4, and 5, and arrives at the position 6, where a projecting segment H, of cylinder M, passes under the ends of the combed fibers, during which time the comb-teeth A, which in position 1 were between the bars B, and run through the sliver of wool between the two series, has been lifted out, as clearly shown in position 2, and the bars slide back, as shown in position 3, without carrying the sliver with it; when clear back from the jaws, as seen in position 4, the comb A again enters between the bars B, and piercing the sliver in a new place, holds it fast; and then the jaw D rises and loosens its grasp upon the fiber, as shown at position 5, where, as before remarked, the segment

H has been brought under the fiber Q; this segment is smooth and covered with leather, like the rollers of a drawing frame; during the progress of the parts above named to the position 6, two rollers F, G, which run in contact, rise together, and at the position 6, the upper roller F, which is grooved, has a short forward movement around G, so as to bring it in contact with the surface of the segment H, by which the ends of the fiber are pinched between said segment and roller; thus situated, the segment continues its rotary motion, and by the contact turns the rollers F, and G, with it, and draws the ends of the fibers of wool between them; a single comb E, at this instant is thrust through the sliver Q, close to the jaw D, at the precise point where the fibers were pinched in the jaws; in this state the roller moves away from the segment H, which passes around, leaving the rollers to fall down to their lowest depression. Having entirely drawn out the fibers from the sliver, this small portion of fibers Q', then hangs down, and as the rollers again rise, the ends of the fiber Q', which have not been combed, are struck by the succeeding segment of comb teeth, as clearly illustrated by the positions 4, 5, 6, at which time the roller F again seizes a second portion Q, of the fiber which has been brought down between the jaws C and D, by the bars B sliding forward on plate C toward D, when the parts assume the first position again, and the next portion of fiber is grasped and combed by the same set of teeth, which finish afterward the preceding portion of fiber that had been previously taken from the jaws by the rollers. The second portion of fibers drawn between the rollers F, G, are united with the first, and as the process is continued, a sliver of long fibers of wool is formed, and passes off through condensing rollers, shown in Plate I, Fig. 1. In this last named figure, (which is a vertical section of the machine) is represented a brush N, below the cylinder, which revolves with rapidity in the contrary direction to cylinder M, and cleans off the short fibers or "noil" combed from the long fibers, these short fibers are then taken from the brush N by a doffer P, from which they are removed in a sliver by a comb R, worked in the ordinary way, and the sliver descends into a box below.

The machinery by which the several mo-

tions above described are effected, is made as follows: Upon the shaft O' , is the main drum or cylinder, around and in connection with which all the parts required in combing move. This drum has two sections of combing teeth, projecting from its periphery on opposite sides, which consist of several rows of straight pointed wires, as clearly shown at i, i , Fig. 1; just in rear of the combs are segments H , that stand out about on a line with the teeth; which segments H , are covered with leather drawn tightly over them; beyond this segment the drum is open, there being a space between the segment and the next succeeding comb. The lower part C of the jaws, that feeds the wool to the comb on the cylinder, is attached to the ends of two curved arms (k^3) centering on a shaft (o) above the cylinder, just described, one of which arms (k^3) is shown in Fig. 1; this arm is loose on shaft (o), and is drawn down by a spring (k^2) into the position shown in Fig. 1, where it is arrested by a stationary stop affixed to the frame; on the same shaft (o) as a center, are two other arms (k^1) of like form, one on each side of the frame, and projecting on the side opposite to the arms (k^3) and suspend on their ends a jaw D , which is made to cut against the jaws C in the following way: The arms (k^1) are firmly affixed to shaft (o), and turn with it; there is also upon the same shaft, an arm (k^4), see Fig. 2, that terminates in a segment piece (k^5) which has a long curved slot in it, in which there is a wrist pin fastened, and adjusted to any point in the slot; this pin has a connecting rod (l^1) connecting it with a crank (k) on the shaft (s^{11}), which is turned by means of the train of gear wheels from the prime mover, or band wheel (w) on shaft (s), clearly delineated in Fig. 2; the result of the movement thus effected, is to cause the jaw D , to descend till it comes in contact with the jaw C , gripping the fiber that is between them; after which it presses back the jaw C a certain distance; and then on its return it is accompanied by C till it arrives at the point before named, shown at Fig. 1; and then by moving a little farther, recedes from C , and the jaws are opened, as is also shown in the same figure; this movement is repeated at each semirevolution of the drum on shaft (o^1).

It will be perceived that the series of bars B , before named, lying upon the lower jaw C , are required to slide up and down upon it; this is effected in the following way: A shaft (s^{IV}) is suspended in bearings in the arms (k^3) directly under the jaw C ; near either end of this shaft an arm (v^1) is affixed, forked at the end as shown in Fig. 2; a pin lies in the fork of this lever, that is connected with the bars above, so that when the shaft (s^{IV}) is made to turn a little

in either direction, the bars B , slide up and down, as the case may be; to cause the shaft (s^{IV}) to rotate, and at the same time allow it to follow the movements of the jaw C , with which it is connected by the arms (k^3) on which it is suspended, an arm (v) is affixed to the shaft (s^{IV}) and stands out in a nearly horizontal position; a long slot is made in its end, in which a pin is fastened that can be set to vary the movement; said pin attaches a connecting rod (u) with the lever (v), which connects with the upper end of a long lever ($y^1 y$); this is in two parts, so as to be set at a greater or less angle at their fulcrum, which is a stud projecting from the frame at (s^{III}); the lower arm of the lever (y) bears on its lower end a friction roller, against which a cam (x^1) on shaft (s^{II}) strikes, and causes the motion required for the sliding bars B , independent of the motion of the jaws; there is still another element in this combination, which is the comb A , making all the movements of the bars, and in addition thereto, withdrawing its teeth from between the bars, and again thrusting them forward between them at proper intervals; to accomplish this, a long arm A' projects downward from the comb A , on either side, and a similar one, B' , is affixed to the bars B ; these arms are jointed together at (o^{IV}), as shown by the dotted lines, Fig. 2; a rod T , fastened at (o^{II}) stationary point, extends forward to the back of the comb, and is attached to it, so that when the jaw C , and bars B , are thrust back, the comb teeth are drawn out, but the comb rises and falls with the bars.

When the jaw C , and bars B , return to their state of rest, as shown in Fig. 1, the comb A , returns between the bars. These movements are all required to properly present and comb the first half of an aggregation of fibers, after which they are seized between two rollers, F , and G , the construction and operation of which are as follows: Two stout curved levers, (z), one on each side of the frame, have their fulcrum on shaft ($o. v'$), and curving forward and upward, bear the rollers F , G' on their upper ends; these rollers do not have their bearings in the arms (z), but in levers L^x , attached thereto by a pivot or rule joint; the arms (z) are forced upward at their forward ends by means of a weight suspended to a projection back of the shaft, and the two rollers F , G , are kept pressed together by the same weight, through the intervention of a bent lever (z') connecting rod (z''), and a second bent lever (z'''), and hook rod (z^{IV}) hooked on to the roller journal F , all of which act equally upon the rollers, whatever may be the position of the arms (z). The lever L^x jointed to the end of arm (z) has a bifurcated hook at its outer end, in which the T-shaped head of the rod (z^x) rests, the lower end of said

rod being attached to a lever (z^{vi}), having its fulcrum at shaft (o^{vi}); a spiral spring (x''') is coiled around the rod (z^x), its lower end resting against a set screw, by which its tension is regulated, and its upper end bears up against the under side of lever (L^x). The arm (z^{vi}) is moved up and down by a grooved face-cam (x), on the shaft (s') which makes two revolutions for one of the drum M on shaft (o'); the operation effected by raising the arm (z^{vi}), is to allow arm (z) to rise with it, till the rollers F, G, have attained a proper height, when the arm (z) is arrested by a stop (s^x) on the frame, but the arm (z^{vi}) continues upward, which, by means of the spring (x'''), raises the end of the lever (L^x) and turns inward the roller F, against the segment H of the drum, with a force of contact sufficient to cause segment H, to turn it, and the roller G, so as to pinch and draw in between them the ends of the fiber in the manner before set forth, when the arm (z^{vi}) again descending first brings down the lever L^x , removing thus the roller F' from contact with segment H, and then descending farther, draws down the arm (z), rollers and all, to their lowest point of depression, by which the half combed fibers are drawn from the sliver between the jaws; before, however, the rollers begin to descend and draw out the fibers, a comb E, with a single row of teeth descends through the sliver, close up to the point where the jaw D has pinched it, and remains there till the fibers are separated; its motion is made by a cam (x'') on the shaft (s'') which strikes against a stud roller on the lower end of an arm J, affixed to a shaft (o^v); on which shaft are also affixed two long curved arms J' to the ends of which the comb E, is affixed.

The brush, doffer, and comb have been before described; the shafts are all turned by gearing or bands from the main shaft (s),

see Fig. 2; on the further end of which is a spur wheel (w') gearing into an other (w'') on shaft (s'), on the opposite end of which there is a driving pinion (w''') gearing into a large spur wheel (w^{iv}) on a stud, for carrying the motion to shaft (o') by gearing into a spur wheel (w^v) so proportioned as to make one revolution while the shaft (s') makes two; the condensing rollers are geared to this same wheel (w^v) through the train (6, 6', 6²), and it also drives on its opposite sides a stud wheel (w^{vi}), that communicates motion to shaft (s''), which revolves at the same rate as shaft (s').

The brush N is driven by a band B, running from a small pulley on its shaft on to a drum on the shaft (s); the crank shaft of the comb runs with the brush, and the doffer receives a slow motion from a worm wheel, working into a gear on its shaft; said worm wheel being on the upper end of an inclosed shaft (s) driven by bevel gear from shaft (s').

Having thus fully described the machine for combing wool, what I claim therein as new, and for which I desire to secure Letters Patent, is—

1. The segment drum M, constructed and arranged substantially as herein described.
2. I claim the jaws C, and D, for gripping and presenting the wool properly to the combs, to be combed; and in connection therewith the bars B, and comb A, for delivering the wool.
3. I claim the rollers F, and G, or their equivalent, for seizing and retaining the wool as it is combed, and forming it into a continuous sliver, substantially as described.

J. HEILMANN,

Administrator of Joshua Heilmann, deceased.

Witnesses:

THOS. E. WARREN,
ALBERT H. HOUK.