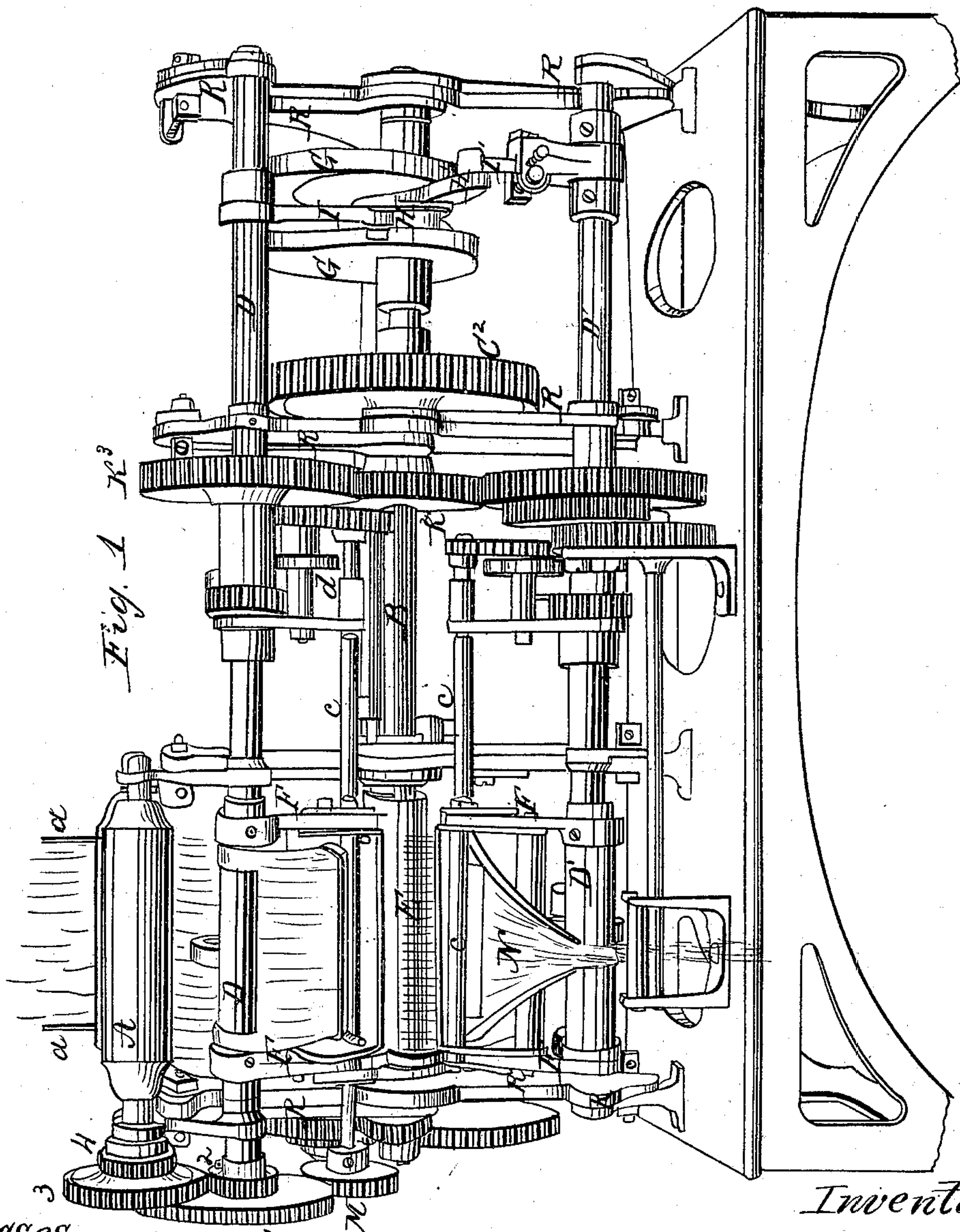


Sheet 1-2 Sheets.

*H. Conant.*  
*Combining Mach.*

*Nº 99,641.*

*Patented Feb. 8, 1870.*



*Witnesses*

*Oliver D. Hughes*  
*John D. Thurston*

*Inventor.*

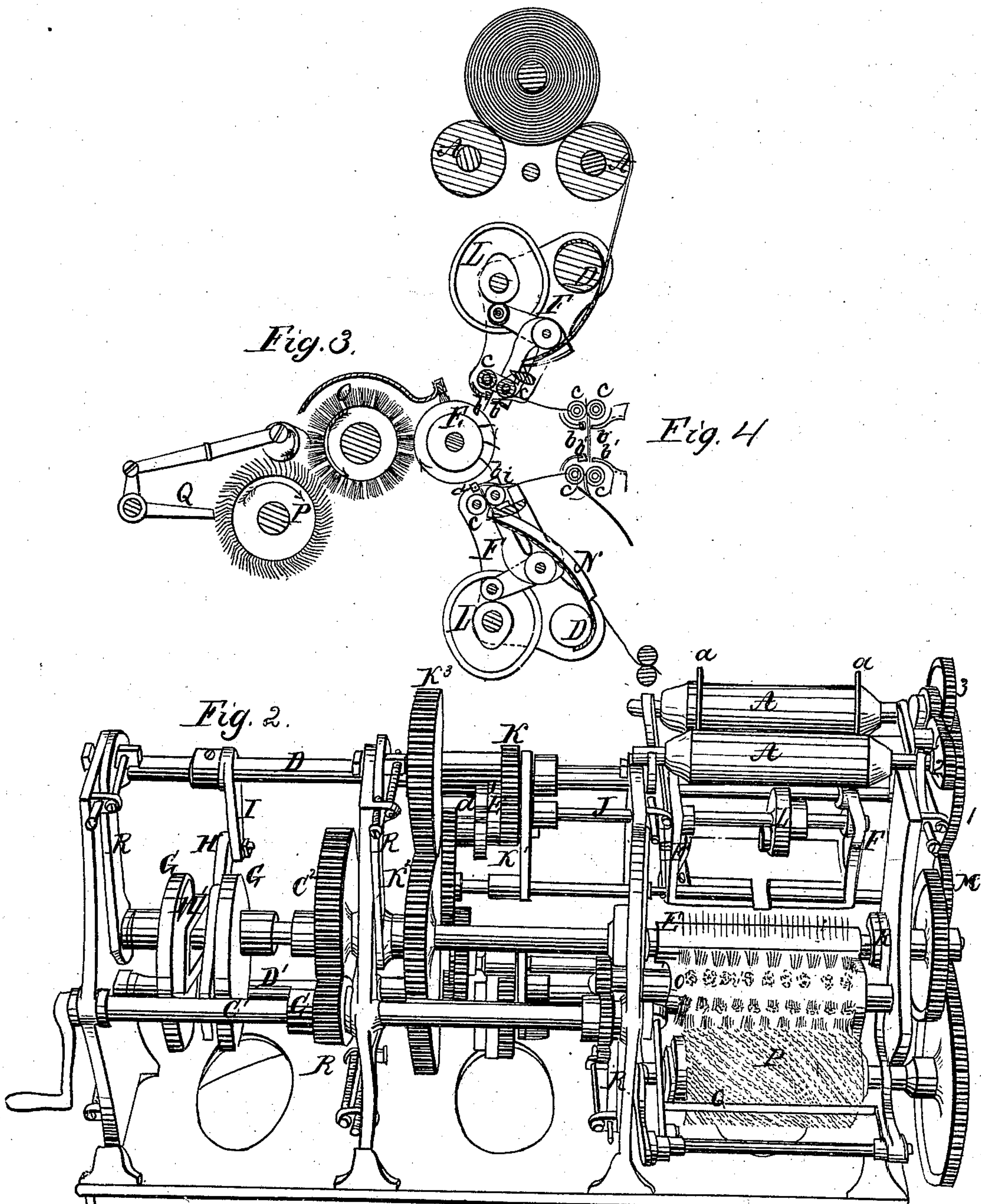
*Henry Conant.*

Sheet 2-2 Sheets

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Witnesses,  
John D. Thurston  
Inventor,  
Hezekiah Conant



# United States Patent Office.

HEZEKIAH CONANT, OF PROVIDENCE COUNTY, RHODE ISLAND.

Letters Patent No. 99,641, dated February 8, 1870.

## IMPROVEMENT IN MACHINES FOR COMBING COTTON, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HEZEKIAH CONANT, of the county of Providence, and State of Rhode Island, have invented certain new and useful Improvements in Machines for Combing Cotton, or similar fibrous material; and I do hereby declare that the following specification, taken in connection with the drawings, making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a front elevation.

Figure 2 is a rear elevation.

Figures 3 and 4 are details of some of the parts.

In the machine hereinafter described, the end of the lap is presented to the combing-cylinder, and while held between a set of jaws, is combed before a tuft is detached. The end so combed is then seized by a second set of jaws, and the end of a tuft then detached, is combed by the same cylinder, simultaneously with the repetition of the combing-operation upon the raw end of the lap.

The principle of the machine, as exhibited in its organization, is the combination of two sets of vibrating nipping-jaws, with a single revolving combing-cylinder. Each set of jaws is furnished with feeding-rollers, travelling with it, and the two sets are so arranged that the effect of their simultaneous movement toward the combing-cylinder is to draw out from the lap a tuft, in the direction of the line of its fibre, and submit the uncombed ends of lap and tuft simultaneously, or in quick alternation, to the action of the comb. The results sought to be accomplished are greater simplicity of action, and greater perfection and economy of execution than is, in my opinion, possessed by any previous machine of its class.

The machine is specially designed for the combing of cotton, but it can, with slight modification, be applied to comb any other fibrous material which can be formed into a lap.

Referring to the drawings, it is to be understood that a roll of lapping, previously prepared, is to be placed upon the supporting-rollers A A, and is held in place by the standards a a.

B is the main or principal shaft, from which the greater part of the subsidiary motions are derived.

In this instance, motion is given to the shaft B by a spur gear, C, upon a countershaft C<sup>1</sup>, (fig. 2,) such gear C engaging with the teeth of the larger wheel C<sup>2</sup>.

D D' are, respectively, rocker-shafts, extending the whole length of the machine, upon the same side, parallel with each other, and equidistant from the axis of the combing-cylinder E, (see the same in section, figs. 3 and 4.)

Attached to radial arms F, projecting from each of these rocker-shafts, is a set of nipper jaws, b b' b', and just above such jaws are feeding-rollers c c, (figs. 3 and 4.)

A vibratory movement is imparted to the rocker-shafts D D', and consequently to the jaws pertaining to them, by the cam-plates G G, figs. 1 and 2, (one for each rocker,) which are mounted on the shaft B.

These plates have grooved cam-faces, which are similar in outline, and operate the rocker-shafts through the media of the links H H' and rocker-arms I I'. This portion of the mechanism is made adjustable, so that the movement of the jaws, relatively to each other, can be timed, as desired, and also the arc of vibration be regulated.

The bearings of the rocker-shafts D D' are set in arms R R, radiating from the axis of the main shaft B, which arms have their position regulated by adjusting-screws, so that the axes of the said shafts D D' can be brought nearer together, or be further separated, whereby the distance between the faces of the two sets of jaws b b' b' can be regulated to accommodate different lengths of staple.

Let it be understood that the end of the roll of lapping, which has been previously supposed to be resting on the rollers A A, is conducted between the upper set of feeding-rollers c c, and projecting beyond the faces of the nipping-jaws b b, (fig. 3,) belonging to the same. The movement of the cam-plate G causes the said set of jaws to present the end of such lap to the combing-cylinder E, which, being mounted on the shaft B, is constantly rotating. After the end of the lap has been combed, the further rotation of the cam-plate causes the jaws to move away from such comb. By the time that such jaws have reached the end of their path of movement, away from the comb, the upper set of feeding-rollers c c, is set in motion, through the agency of the star-wheel d, which obtains an intermittent movement from a pin, projecting from the side of a disk, E', (fig. 2,) mounted upon the shaft J, whose bearings are in the vibratory arms F.

This shaft J has a regular rotatory movement, obtained through the pinions K K<sup>1</sup>, from a movement obtained from the gear-wheel K<sup>2</sup>, on the principal shaft B, transmitted through the gear-wheel K<sup>3</sup>.

The same shaft J (fig. 2) carries a cam, L, (see also figs. 3 and 4,) which controls the periods of opening the nipping-jaws b b, and such cam is so shaped and set, that the jaws will be opened contemporaneously with the movement of the feeding-rollers c c, and, upon the instant that the end of the lap has reached its furthest point of travel in the direction away from the combing-cylinder E. At the same instant that the feeding-rollers c c commence their movement, the supporting rollers A A, for the lap, commence to rotate, such rollers being set in motion by the toothed wheel M, (fig. 1,) on the end of one of the feed-rollers c, through the train of gears 1 2 3 4. Thus the lap is unrolled just to the extent required by the demands of the feeding-rollers.



The second or lower set of nipping-jaws is similar, in construction, to the upper set, and the machinery for operating them, as well as their set of feeding-rollers, is a duplicate of that already described.

The combed end of the lap was, in the preceding description, left projecting from the upper set of jaws, and the feed-rollers *c c* were ready to commence their movement. The relation of the two sets of jaws, and their respective feeding-rollers, will, at this moment, be as indicated at fig. 4. The feed-rollers of the lower set of jaws are put in motion at the same time as the rollers of the upper set, and both sets of jaws are open. The end of the lap, hanging pendent from the upper rollers, is taken between the lower rollers, and both sets of jaws now commence to move toward the comb, both closing fast upon the cotton which spans the space between their faces. The result is, that a tuft is detached from the lap, by a pull in a straight line, parallel, or nearly so, with a line drawn tangent to both the circles of which the paths of vibration of the jaws are respectively arcs.

The tuft, so detached, is held in the lower jaws *b' b'*, by its combed end. Its opposite end is, by the vibration of the jaws, presented to the cylinder *E*, and combed. At the same time, or nearly so, the raw end of the lap, held by the jaws *b b*, is brought up to the same cylinder and combed. When the two sets of jaws are again in the position shown at fig. 4, the tuft (now completely combed,) by the movement of the lower set of rollers, before described, is allowed to deposit itself upon the collecting-apron *N*, fig. 1. From thence it is condensed, and taken off in any preferred way.

The machine is furnished with a suitable brush-clearing cylinder, *O*, doffer-cylinder *P*, and stripper *Q*, for collecting the waste, (figs. 2 and 3,) which require no description.

I am aware that in the English Letters Patent, granted to Smith & Wilson, February 2, 1867, an apparatus is shown for combing fibrous material, involving the employment of two sets of vibrating nipping-jaws, in combination with one or more carding-aprons, but in this case, the arrangement of the two sets of jaws, with respect to the combing-aprons, and the general organization of the machine, is such that the fibre of the material to be combed must be broken, in the act of being transferred from the first to the second set of jaws. While, therefore, I do not claim the employment of two sets of vibrating jaws as new, nor their combination with an apparatus for combing tufts of cotton or other material, while held by such jaws,

What I do claim as of my invention, and desire to secure by Letters Patent, is—

In a machine for combing cotton or other fibrous material, the combination of a combing-cylinder, *E*, with an upper set of vibratory nipping-jaws, provided with feeding-rollers, and a lower set of similar jaws, provided with delivery-rollers and collecting-apron, arranged with relation to the said delivery rollers, substantially as shown and described.

HEZEKIAH CONANT.

Witnesses:

JOHN D. THURSTON,  
PETER F. HUGHES.