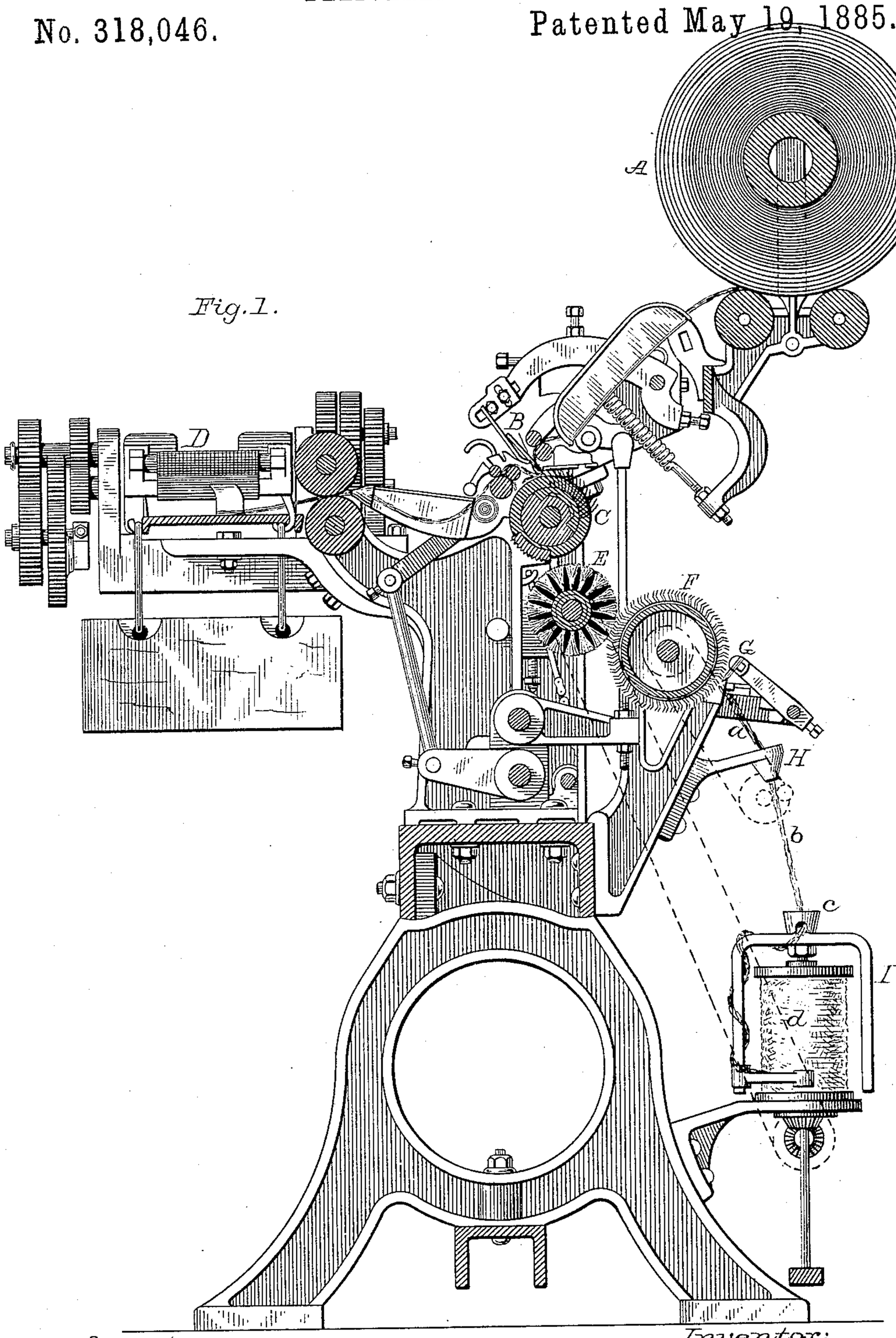
(No Model.) 2 Sheets—Sheet 1.

C. W. SIMMONS.

COMBING MACHINE AND METHOD OF WORKING SHORT COTTON DELIVERED THEREFROM.

No. 318,046. Patented May 19, 1885.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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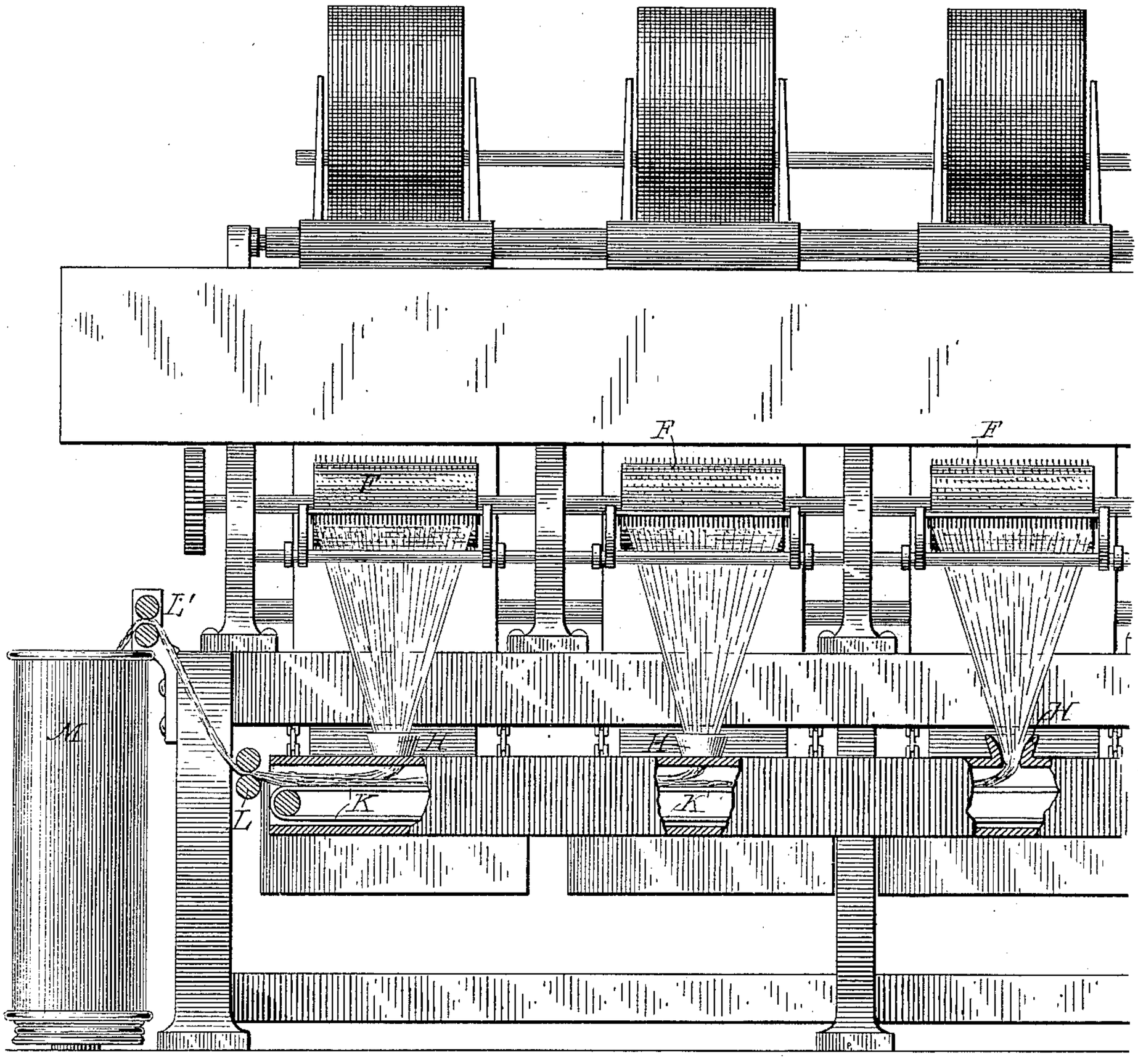
COMBING MACHINE AND METHOD OF WORKING SHORT COTTON DELIVERED THEREFROM.

No. 318,046. Patented May 19, 1885.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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COMBING-MACHINE AND METHOD OF WORKING SHORT COTTON DELIVERED THEREFROM.

SPECIFICATION forming part of Letters Patent No. 318,046, dated May 19, 1885.

Application filed January 27, 1883. Renewed February 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SIMMONS, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Combing-Machines and the Method of Working Short Cotton Delivered Therefrom; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

It is well known that cotton-combing machines are only employed in working the grades of cotton of which the "sea island" is a prominent variety, and it is equally well known that the combed fiber extracted from each pound of cotton bears a comparatively small proportion to the residuum—in fact, sometimes as low as twenty per cent. of the gross weight of cotton fed to the comber. So far as my knowledge extends, the short cotton or residuum rejected by combing-machines has always heretofore been delivered therefrom in matted and tangled bulk, and has been considered as a high grade of cotton waste, and has been sold as such at rates always far below those of bale-cotton of substantially the same character, having reference to length of staple, fineness, and color. The actual value of this waste, as heretofore delivered from the combers, although sometimes used for spinning, is less than that of similar bale-cotton, because, in order to work it for spinning, it must be subjected to nearly the same degree of opening and carding as the crude bale-cotton, and the fiber is thereby torn, broken, and stripped much more than said crude cotton is, because the cotton waste is derived from cotton which before presentation to the comber has been already fully opened, cleaned, and carded, and it is this additional or excessive opening and carding that seriously impairs the fiber for spinning purposes. It is also well known that cotton-combing machines require more or less frequent attendance for the removal of the short cotton, because of its great bulk, and because, if not removed, it is liable to clog certain portions of the machines.

The object of my invention is to utilize short-cotton comber-waste to the best possible advantage and wholly unimpaired for spinning purposes, and at the same time to obviate the cost of attendance upon the combing-machines, and in doing this I materially increase the value of the short cotton and correspondingly lessen the cost of combed cotton, and I also obviate the expense of opening and carding heretofore involved in preparing said short cotton for spinning.

In practicing my invention I employ any cotton-combing machine in which a toothed combing-cylinder or its equivalent is or can be employed for removing the short cotton from tufts held by nippers, provided said cylinders be of that character which will admit of the clearance, by any suitable mechanism, of the short cotton from its teeth in the form of a web, after the manner of delivering-webs by the doffers of cotton-carding machines. As a type of this general class of combing-machines, and one which I deem of special value in the practice of my invention, I will refer to the well-known "Heilmann combing-machine," in which the combing-cylinder is cleared by a brush which deposits the short cotton evenly upon a doffing-cylinder, from which the cotton is cleared by a comb which deposits the cotton in mass into a receptacle provided for its reception.

Cotton-combing machines which embody two nipper-cylinders and a doffer co-operating with both of them may also be used by me. For instance, such as are shown in French Letters Patent of Dimock, A. D. 1864, and also in his United States Letters Patent No. 49,865, September 12, 1865.

In accordance with the main feature of my invention, I employ, in combination with the combing mechanism, a doffer-cylinder and its comb, and a condensing device for forming the web of short cotton delivered from the doffing-cylinder into a sliver; and in connection therewith I employ mechanism for conveying and coiling said sliver into a condition from which it can be properly delivered to such evening and drawing machinery as is usually involved in the art of spinning; and I also employ in connection therewith doubling mechanism for combing two or more

slivers into one, rendering the subsequent evening operation readily accomplished.

By the term "condensing devices," as herein employed by me, I do not mean such as merely flatly compress the web which is delivered from the doffer, and which serve merely as aids to the comb which clears the web of short cotton from the doffer—as, for instance, the web-rolls shown by Dimock in his said French Letters Patent, and such as are not shown but described in his said United States Patent—because, although as aids to the doffer, I can, as heretofore, employ such web-compressing rolls without materially affecting the desired results, I can and do dispense with them, although I do employ rolls as mere conveyers, and also employ them as compressing devices after the web has been laterally condensed into a sliver, so that a proper bite will be thereby afforded during the twisting of the sliver for developing it into what may be termed "coarse roving." The condensing device referred to may be variously constructed; but the simplest form thereof known to me is the well-known "trumpet" or "trumpet-eye," which, as the web is delivered from the cylinder, causes it to be evenly contracted laterally and concentrated centrally into a sliver. The coiling mechanism referred to may also be variously constructed and arranged; but the simplest form thereof known to me is the well-known revolving can placed beneath rolls between which the sliver passes. In lieu of a can, a flier may be used which will deliver the sliver slightly twisted upon a bobbin. In some cases coincident friction-belts moving in contact in opposite directions may be employed for converting the flat web of fiber into a cylindrical sliver, the web entering at one side or edge of the belts and the sliver leaving at the opposite edge, and thence passing to a bobbin, after the manner of working roving in the well-known Taunton speeder. For obtaining the best results I prefer to employ combing-machines which involve a number of combing-heads, six, for instance, and combine with such machine a series of condensing devices, one for each head, and doubling, conveying, and coiling mechanism, which is common to all of said heads.

After a full description of the mechanism illustrated by me and its mode of operation, the features deemed novel will be specified in the several clauses of claim hereunto annexed.

Referring to the drawings, Figure 1 illustrates in vertical section a Heilmann combing-machine embodying my invention and adapted to deliver a single sliver to a flier. Fig. 2 illustrates so much as is deemed necessary of a Heilmann combing-machine containing three combing-heads with my improvements attached thereto, whereby the several slivers are condensed into one sliver and delivered to or coiled in a can, the view being from the rear of the machine.

Referring to Fig. 1, it is to be understood that a web of thoroughly opened, cleaned, and carded cotton in the roll A is delivered to the nippers at B, where it is combed by the toothed combing-cylinder C, and that a web of combed long staple cotton in the form of a sliver is delivered through a trumpet to the rolls D, as heretofore; also, that the short cotton is cleared from the toothed cylinder C by the brush-cylinder E, and cleared from said brush by the cord-clothed doffing-cylinder F, from which said short cotton is in turn cleared by the vibrating comb G, as heretofore; but instead of allowing the cotton thus cleared from the doffing-cylinder F to fall in mass into a waste-box, as heretofore, I carefully preserve it in proper condition for operations preliminary to spinning, without incurring the cost of reopening and recarding, as heretofore, and without injuring the fiber by the overworking of the cotton necessarily incident to those operations.

It will be seen, as in Fig. 1, that I have combined with the doffing-cylinder F a concentrating trumpet-eye, H, located centrally of the web *a* as it is delivered from the doffing-cylinder, so that the web of short cotton is concentrated in a sliver, *b*, in a manner well known. From said trumpet-eye in this case the sliver passes into the trumpet-shaped neck *c* of a large slowly-revolved flier, I, whereby said sliver is slightly twisted and coiled under trifling tension upon the bobbin at *d*. It is generally preferable in all cases that slowly-revolved delivering-rolls be employed between the neck of the flier and the trumpet-eye H, as indicated in dotted lines. For thus delivering the sliver from a single web directly upon a bobbin or spool a great variety of mechanism may be employed without departure from the main feature of my invention. It is obvious that the slivers from two or more combing-heads may be readily worked by one flier.

In Fig. 2 the three combing-heads are each substantially as shown in Fig. 1; but, instead of separately controlling each sliver the three slivers are combined into one and then coiled in a can. To accomplish this I use with each doffer-cylinder F a trumpet, H, as before described; but below the trumpets there is an endless railway-belt, K, continuously driven by end rolls, as is common with carding-machines operated in sets, so that the combined sliver is delivered at the end of the belt to rolls L, and thence to elevated rolls L′, which in turn deliver it to the rotating can M, into which it is coiled and slightly twisted. If it be desirable to at once draw and even the consolidated sliver, a railway-head, as is common with carding-machines, is employed between the belt and the can.

It is obvious, from the fact that by reason of my invention the removal or conveyance of short cotton from the combers is automatically performed, instead of by hand, as heretofore, that my devices may be justly deemed improvements in combing-machines, and it is

still more apparent when said improvements are considered with reference to the important fact that the by-product or short cotton from the combers is, by reason of my invention, so far enhanced in value as to thereby practically lessen the cost of the prime product or combed cotton. With my devices the comber-room may be kept much neater or free from droppings and flyings than when waste-boxes are used for each comber, and any given number of my improved machines may be successfully operated in much less space than the ordinary combers, it being obvious that two sets of machines may be set back to back, and that both sets can deliver their short-cotton slivers to the same railway-belt, and if the latter be boxed, as I prefer, it can be arranged to serve as a footway for passing between the sets for adjustment or repairs. It will be readily seen that the direct concentration of the web of rejected short cotton into a sliver and the coiling of said sliver into suitable shape for spinning purposes without reworking in openers or lappers and carding-machines constitutes a valuable and novel method of working short cotton delivered from cotton-combing machines.

Having thus described my invention, I claim as new to be secured by Letters Patent—

1. The combination, substantially as hereinbefore described, of cotton-combing mechanism, a doffer-cylinder for receiving the short cotton rejected by the combing devices, a comb for clearing a web of short cotton from said cylinder, and a condensing device for laterally concentrating said web into a sliver, as and for the purposes specified.

2. The combination, substantially as hereinbefore described, of cotton-combing mechanism, a doffer-cylinder receiving short cotton rejected by the combing devices, a comb for clearing a web from said cylinder, a condensing device for laterally concentrating said web into a sliver, and mechanism, substantially as described, for conveying and coiling said sliver into a condition suitable for subsequent workings preliminary to spinning.

3. The combination, substantially as hereinbefore described, of two or more cotton-combing heads, their doffer-cylinders and combs, a web-condensing device for each cylinder, and doubling mechanism common to all the combing-heads, substantially as described, whereby slivers of short cotton are delivered from each doffer-cylinder and the several slivers condensed into one sliver, as set forth.

4. The method of working short cotton rejected by cotton-combing machines, substantially as described, which consists in directly concentrating a web of said cotton into a sliver in the combing-machine and coiling the same into condition suitable for spinning purposes without carding or other reworking, as set forth.

CHARLES W. SIMMONS.

Witnesses:
SIMON W. SIMMONS,
JAMES F. SIMMONS.