(No Model.) 2 Sheets—Sheet 1.

T. T. ABBOT.

MACHINERY FOR SPINNING COTTON YARN.

No. 317,607. Patented May 12, 1885.

Fig. 1.

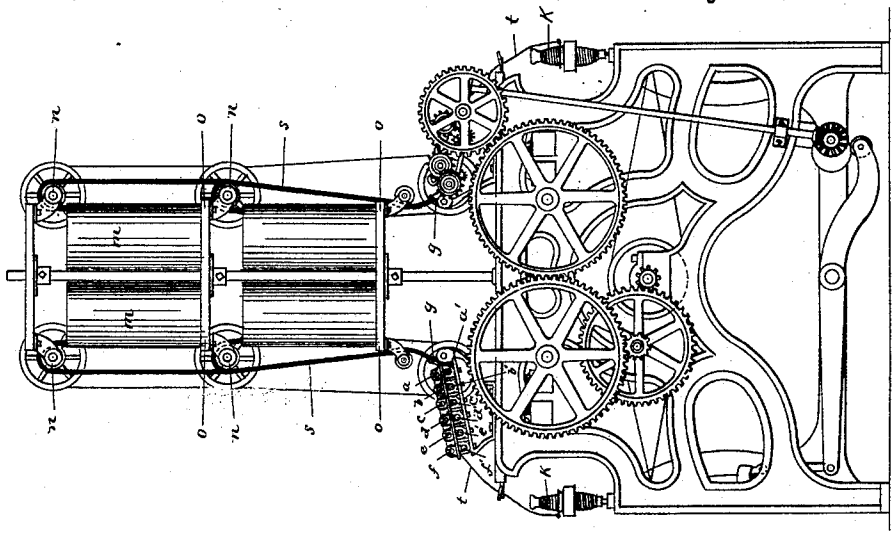
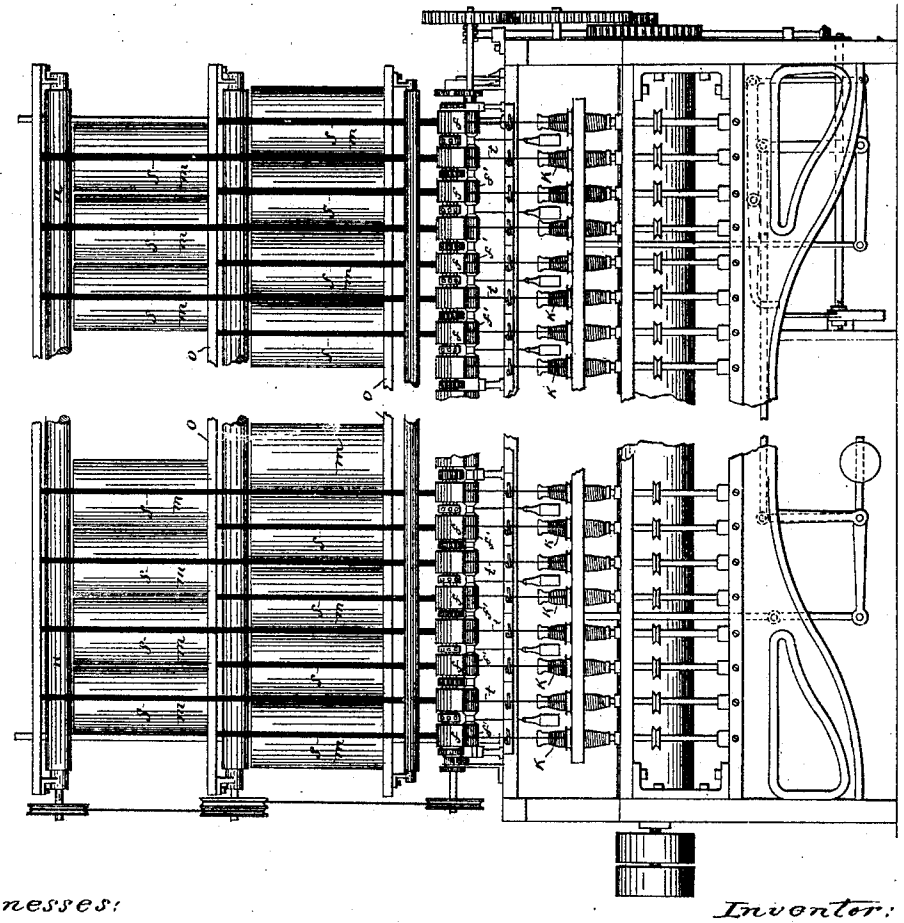


Fig. 2.



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attorney

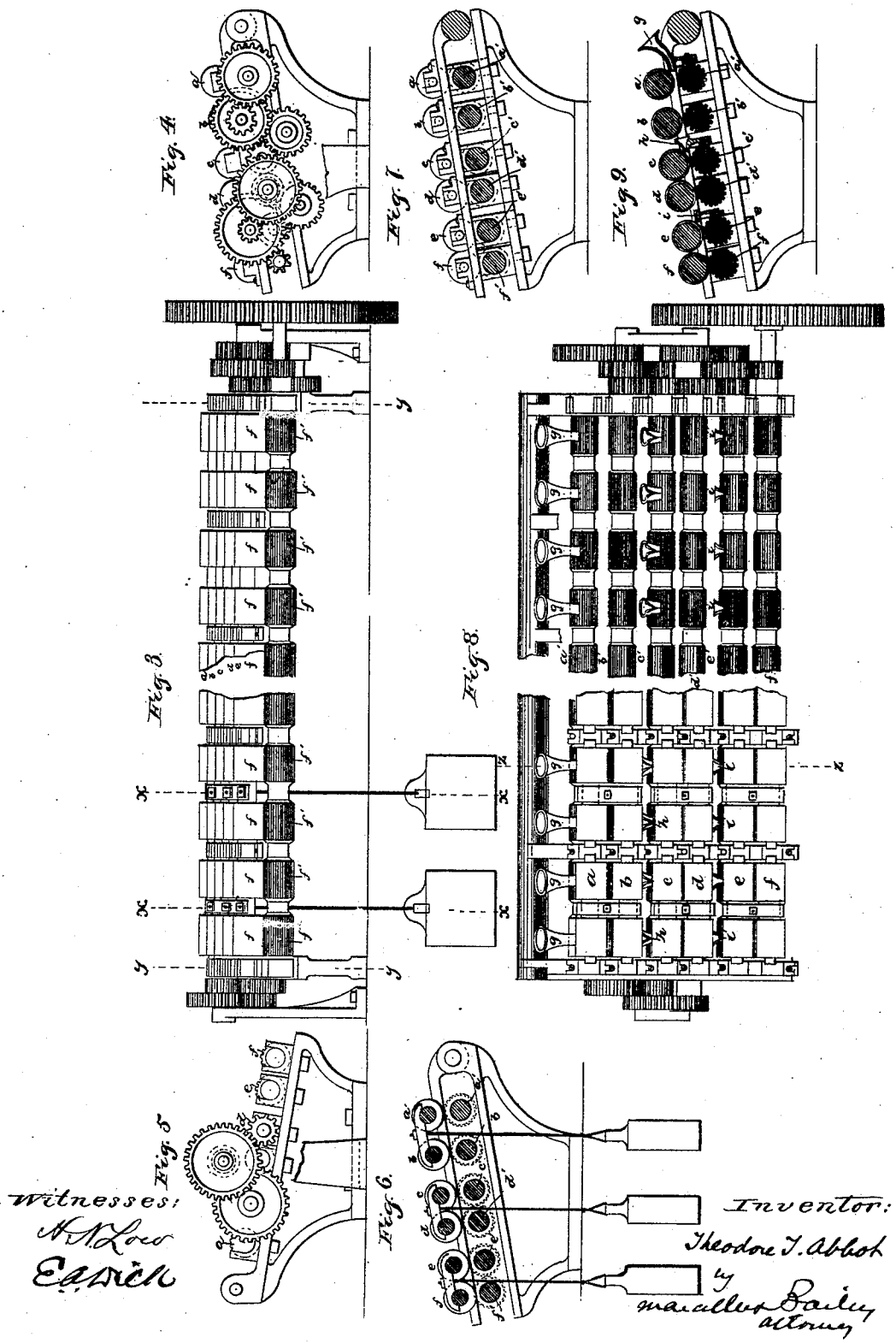
N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

T. T. ABBOT.

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No. 317,607. Patented May 12, 1885.



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UNITED STATES PATENT OFFICE.

THEODORE THOMAS ABBOT, OF LUNENBURG, ASSIGNOR TO THE ABBOT SPINNER COMPANY, OF BOSTON, MASSACHUSETTS.

MACHINERY FOR SPINNING COTTON YARN.

SPECIFICATION forming part of Letters Patent No. 317,607, dated May 12, 1885.

Application filed April 2, 1885. (No model.)

To all whom it may concern:

Be it known that I, THEODORE THOMAS ABBOT, of the town of Lunenburg, county of Worcester, and State of Massachusetts, have invented a new and useful Improvement in Machinery for Spinning Cotton Yarn, of which the following is a specification.

In Letters Patent of even date herewith I have described and claimed a process of making cotton yarn, consisting in bringing the cotton yarn to the condition of sliver, and drawing and doubling the sliver for the purpose of evening it, then further drawing and compacting or condensing, without twisting, the sliver thus prepared until it is reduced to the attenuated form requisite to allow it to be spun directly into yarn, and finally spinning said attenuated sliver directly into finished yarn, as contradistinguished from roving, thus dispensing entirely with any and all roving-frames, and practically putting no twist in the sliver until at the time it is converted into yarn. In other words, the sliver is taken in the condition in which it is as it comes from the drawing frame or frames, after having been subjected to the ordinary doubling and drawing operation, and then, instead of being made first into roving, and subsequently into yarn, as is usually the case, it is made directly into yarn. In effectuating this process I have devised novel machinery, which is the subject of the present application, the same being, mainly, characterized by the combination of drawing-rollers arranged and operating to reduce sliver, without twisting it, to the attenuated form requisite to allow it to be spun directly into yarn, trumpets, or condensers to compact or condense the sliver during the operation of reducing it to this form, and ring-spindles and travelers, or their equivalents—such as throstles or mules—to which said attenuated sliver is directly conducted, and by which it is directly spun into yarn, as contradistinguished from roving. With these instrumentalities I also prefer to combine a can-stand for holding the cans containing the sliver to be operated on, said stand being arranged preferably above the level of the drawing frame or rollers.

The nature of my improvement and the manner in which the same is or may be carried into effect can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is an end view of the machine. Fig. 2 is a front elevation thereof, with the center portion broken away to bring the ends nearer together. Fig. 3 is a front elevation of the drawing-rollers with the center portion broken away, as in the last preceding figure. Fig. 4 is an end elevation of the drawing-rollers and their supporting-frame, showing the gearing at that end for driving the said rollers, the bracket or stand which furnishes the bearings for the intermediate gear-wheels, or some of them, being broken away. Fig. 5 is a like elevation of the other end of the frame and rollers, with the bracket or stand at that end broken away, as in the last preceding figure. Fig. 6 is a cross-section on line *x x* of Fig. 3. Fig. 7 is a cross-section on line *y y* of Fig. 3. Fig. 8 is a top view of the drawing-rollers, their driving-gearing and supporting-frame, the center portion of the rollers being broken away. In that portion of the figure to the right of the break the upper rollers are removed to expose to view the lower or fluted rollers and the trumpets. Fig. 9 is a section on line *z z*, Fig. 8.

There is shown in the drawings a machine provided with several sets of drawing-rollers, the slivers passing through the grip of six pairs of drawing-rollers of each set. These rollers may be of any known construction and caused to revolve by any known kind of machinery, and the upper may be pressed upon the lower rollers in any known way. Moreover, I do not confine myself to any precise number of pairs of rollers, nor to any precise speed of revolution thereof, nor to any precise relation of the speed of one roller to that of its successor in the series; but I prefer to revolve the third pair of rollers at the same or at about the same speed as the second pair, and the fifth pair at about the same speed as the fourth pair, and so on, in succession when more than six pairs are used, the fiber being thus drawn between the first and second and the third and fourth and the fifth and sixth pairs of rollers. The slivers may be doubled and drawn by these rollers; but I prefer merely to draw them.

In spinning No. 20 yarn, for instance, I use

sliver weighing sixty grains to the yard, and run the first pair of rollers, *a a'*, with a surface-speed of two and twenty-two one-hundredths inches per minute; the second pair, *b b'*, with a surface-speed of seven and ninety-two one-hundredths inches per minute; the third pair, *c c'*, at the same speed as the second pair, *b b'*; the fourth pair at a surface-speed which is forty-eight and thirty-three one-hundredths inches per minute; the fifth pair, *e e'*, at the same speed as the fourth pair, and the sixth pair at a surface-speed of three hundred and fourteen inches per minute. At these revolutions of the rollers I run the spindles, according to the number of turns to the inch desired in the finished yarn, at from six thousand to seven thousand revolutions per minute. These speeds may of course be varied either absolutely or proportionately for the same number of yarn or for different numbers of yarn and for different weights of sliver; but the experienced spinner will know how to vary the speeds properly or even the number of pairs of rollers, according to the required extent of elongation or drawing of the sliver before it is spun, after reading the rule I have given for No. 20 yarn from sliver weighing sixty grains to the yard. I cannot draw the sliver to the extent required without using trumpets to condense or compact the sliver as it is being drawn, the trumpets serving to gather the outlying or outwardly-projecting fibers into the body of the sliver; and I prefer to use with six pairs of rollers three trumpets, *g h i*, for each sliver, the first trumpet acting upon the sliver *s* as it enters the frame, the second applied between the second and third pairs of rollers, and the third between the fourth and fifth pairs; but I intend to use a greater or less number of trumpets. These trumpets I prefer to make stationary or non-revolving; but they may be of any usual construction.

The sliver *t*, delivered by the last pair of drawing-rollers, is furnished to spindles provided with rings and travelers, (shown at *k k*,) and spun by them, as usual, except that the yarn receives its whole necessary twist by means of these spindles, the spindles spinning the yarn from drawn and doubled sliver, and not from drawn and doubled roving, as usual. These spindles, rings, travelers, and the mechanism for driving them may be of any usual construction.

The sliver to be drawn and spun in my machine is contained in cans *m m*, by preference arranged in a double tier one above the other, and supported above the drawing-rollers on a can-stand, *o o*, and the sliver is lifted out of these cans by rollers *n n*, over which the sliver passes, as usual; and I prefer to make the machines double, as shown in the drawings—that is, with two complete sets of cans, drawing-rollers, trumpets, ring-spindles, and their accessories. The sliver in the cans is in the condition in which it usually is when supplied to the slubber or first speeder in the ordinary process of spinning, in which condition it is ordinarily termed "drawing." In the operation of my machine this sliver is taken from the cans, drawn by the rollers, compacted or condensed by the trumpets, and finally spun into yarn by the spindles.

Now I know that prior to the date of my invention several pairs of drawing-rollers with intervening trumpets—in one instance stationary and in the other revolving—have been described as a useful combination with a spindle, bobbin, and flier for making roving, which roving was to be converted by a subsequent process, in some kind of a spinning-machine, into yarn; but so for as I know the combination of successive pairs of drawing-rollers arranged and operating to receive sliver—that is to say, a strand or ribbon of untwisted cotton fibers—and to reduce the same, without twisting, from that condition to the attenuated form requisite to allow it to be spun directly into yarn, trumpets to compact or condense said sliver during this process of reduction, and ring-spindles for converting said sliver directly into yarn, is new with me.

What I claim herein as new and of my own invention is—

1. The combination of successive pairs of drawing-rollers arranged and operating to receive sliver, and to reduce the same, without twisting, to the attenuated form requisite to allow it to be spun directly into yarn, as contradistinguished from roving, trumpets to compact or condense said sliver during this process of reduction, and ring-spindles, and travelers or their equivalent, to which said sliver is directly conducted, and by which it is directly converted into yarn, substantially as hereinbefore set forth.

2. The combination of successive pairs of drawing-rollers arranged and operating to receive sliver, and to reduce the same, without twisting, to the attenuated form requisite to allow it to be spun directly into yarn, as contradistinguished from roving, trumpets to condense said sliver during this process of reduction, ring-spindles or their equivalent, whereby said attenuated sliver is spun directly into yarn, and a can-stand and cans arranged above the drawing-rollers, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 30th day of March, 1885.

THEODORE THOMAS ABBOT.

Witnesses:

ELMER P. HOWE,

W. H. WILBUR.