(No Model.) 3 Sheets—Sheet 1.

C. FLETCHER.

SILK SPINNING MACHINE.

No. 286,802. Patented Oct. 16, 1883.

Fig. 1.

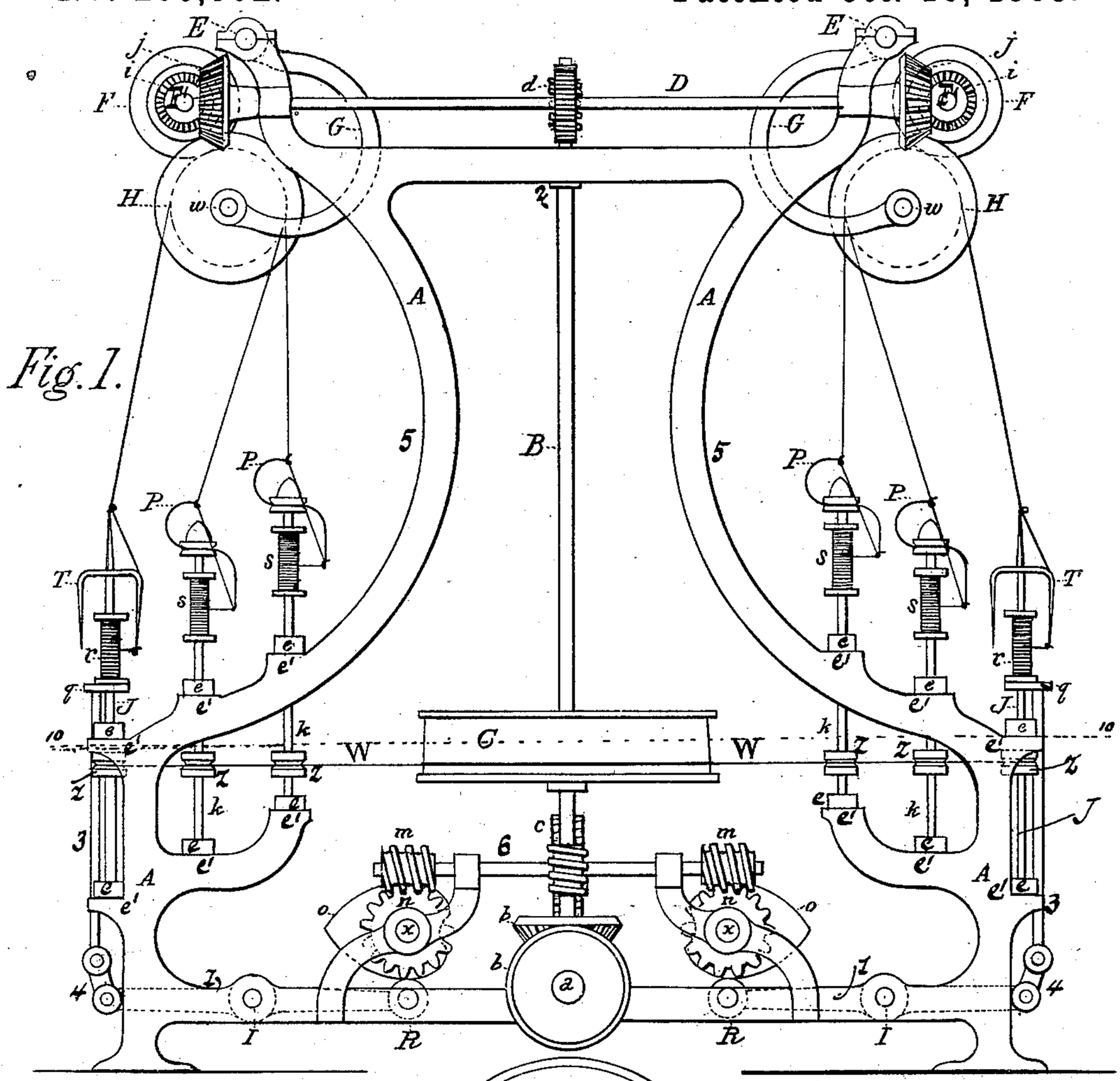
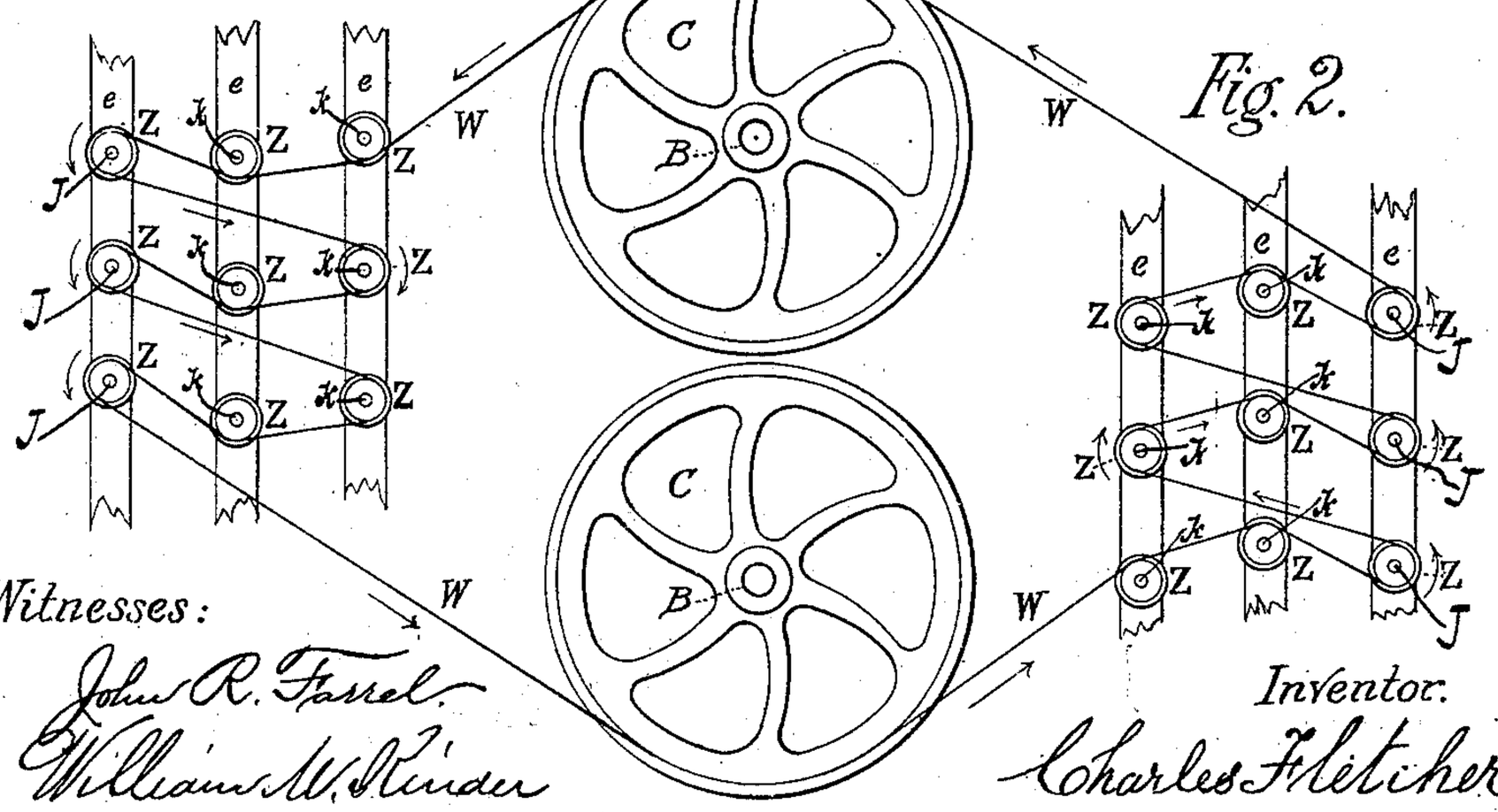


Fig. 2.



Witnesses:

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Inventor.

Charles Fletcher

(No Model.)

3 Sheets—Sheet 2.

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SILK SPINNING MACHINE.

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Fig. 3.

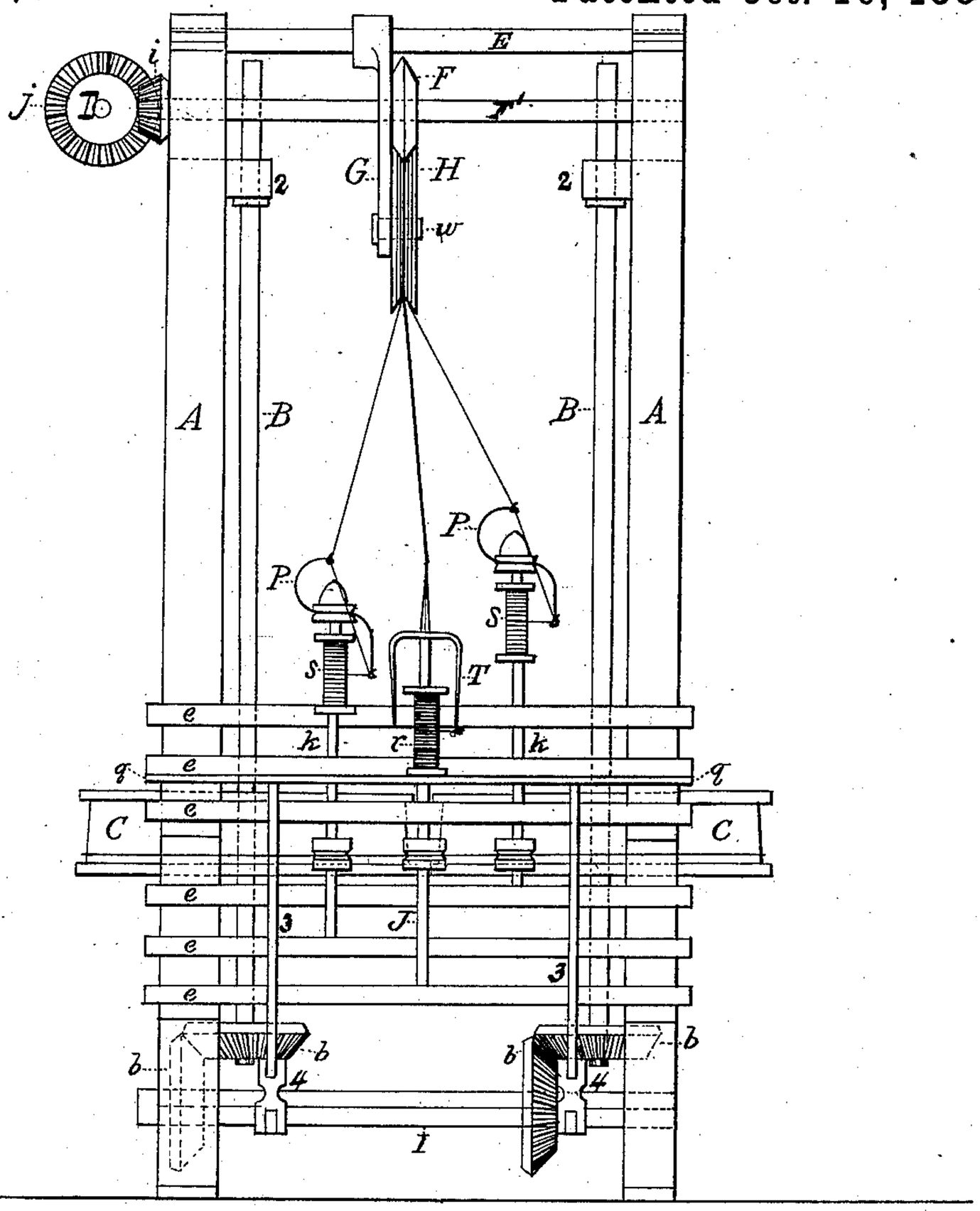
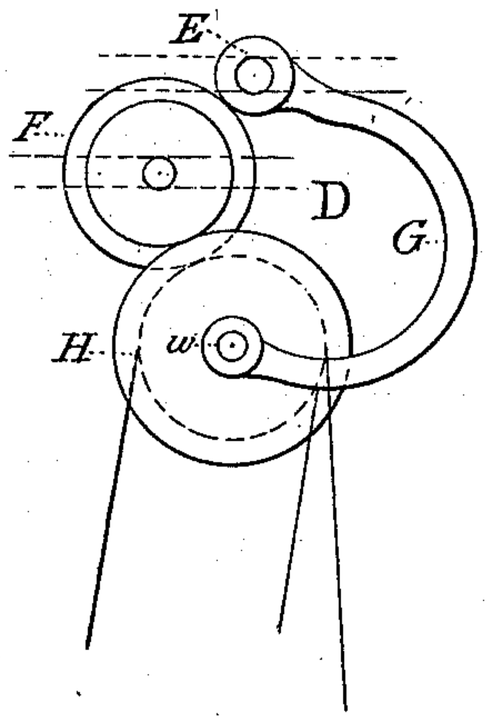


Fig. 4.



Witnesses.

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(No Model.) 3 Sheets—Sheet 3.

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Fig. 5.

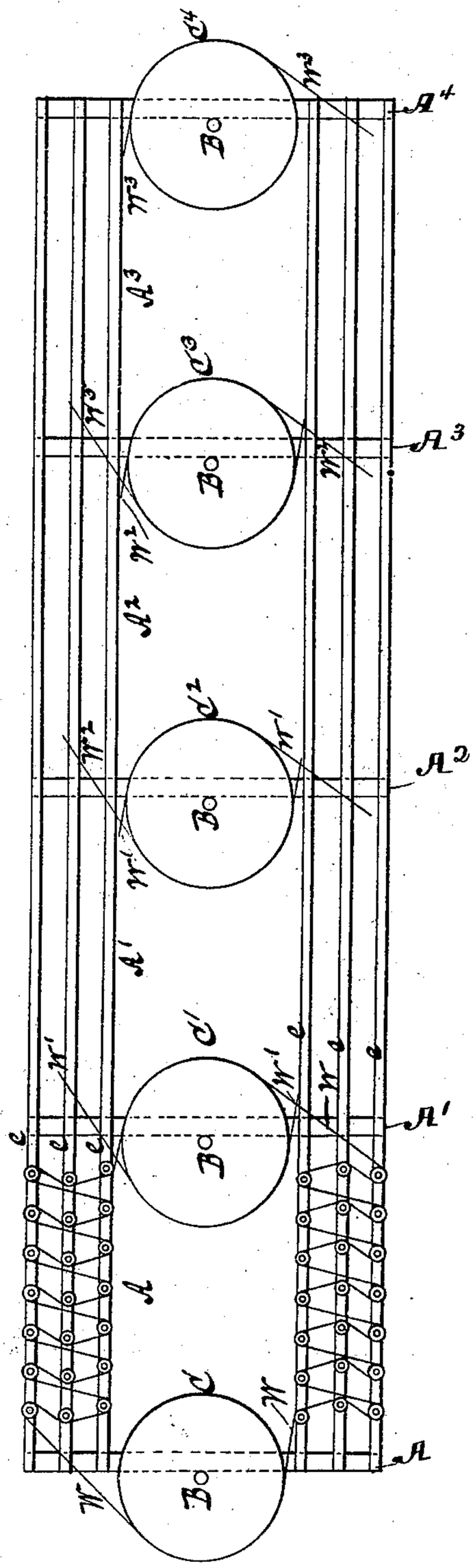
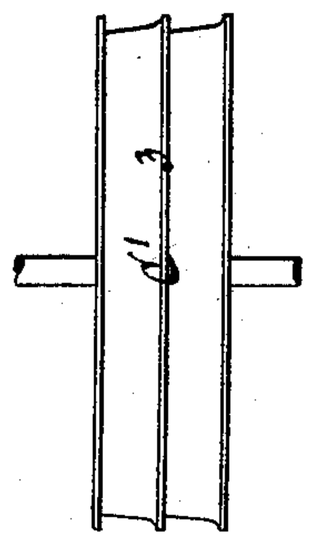


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES FLETCHER, OF BROOKLYN, NEW YORK.

SILK-SPINNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 286,802, dated October 16, 1883.

Application filed April 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FLETCHER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Silk-Spinning Machines, of which the following is a specification.

The present invention relates to that class of silk-spinning machines in which are employed bobbins or revolving spindles for twisting two "singles" or silk filaments in the same direction, and other bobbins or spindles revolving in an opposite direction for twisting two singles together in an opposite direction to that in which the singles themselves are twisted.

The invention consists in the construction and combination of parts hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical end view of a silk-spinning machine embracing my improvements. Fig. 2 is a horizontal transverse section taken on the plane of the line 10 in Fig. 1, certain parts, however, being left off to more clearly exhibit the relative arrangement of the several series of bobbin-spindles and the pulleys and endless band for driving the same. Fig. 3 is a front elevation of one of the frames, showing the relative arrangement of the bobbin-spindles arranged in different planes and out of line with each other. Fig. 4 is a detail view of the draw-pulley to supporting-arm and the friction driving-pulley. Fig. 5 is a ground diagram, showing the arrangement of the pulleys and belts for operating three rows of bobbin-spindles on each side of the machine. Fig. 6 is a view of the double-faced spindle driving-pulley.

A A is the frame end or standard.

a is the main driving-shaft, which connects with the vertical shafts B throughout the machine by miter-gear wheels *b b*, which arrangement secures a positive motion to the various parts of the machine. The said vertical shafts B are five in number, and there are also five standards A. The said vertical shafts B work in a spindle-step on the bottom rail of each standard, and in a collar, 2, on the top rail of each standard. The spindle-rails *e* are each rigidly bolted down on the several standards on steps formed thereon for them at *e'*. Each of the vertical shafts B carries a disk driving-pulley, C, which drives the spindles J and *k k* by the spindle-band W. On the front spindles, J, are the bobbins *r*. The bobbins on the two inner rows of spindles are shown at *s*. The bobbins on the two inner rows of spindles contain the single unspun threads, which pass through the fliers P, being spun by their several spindles, then the two threads pass off the two bobbins *s s* over the leather V-grooved draw-pulley H down to the bobbin *r*, on the front spindle, J, by which they are spun together while passing through the flier P. The draw-pulley H is driven by the friction-pulley F, the motion to which is given by the miter-gear wheels *j* and *i* from the shaft D, which is connected by the worm and gear wheel *d* to vertical shaft B. The doubled thread is guided onto the bobbin *r* by the bobbin *r* being raised and lowered with the lift-rail *q*, on which it rests. The lift-rail *q* moves freely up and down on or around the spindle J, and is connected by rod 3 and link 4 to the lever 1, as shown in Figs. 1 and 3. The lift-rail *q* is raised and lowered by the cam *o*, working on the roller R on the lever 1, mounted on the rock-shaft I. The said cam revolves on the shaft X, upon which is the wheel *n*, which is turned by the worm *m*, formed on a shaft, 6, which is connected by worm and spur wheel *c* to the vertical shaft B.

In Fig. 2 is seen the arrangement of the spindle and the band for driving the same, said band passing in the direction of the arrows and running over warves Z on the rear and middle spindles, *k k*, and then around a similar warve on the spindle J on the front spindle-rail, and so in the same way throughout the whole length of the machine. Thus the spindles on the two inner rails, and which contain the single unspun threads, are turned one way, and those on the front spindle-rails are turned the contrary way. Only nine spindles on each side are shown in this figure as being driven by the band from the two disk-pulleys C C; but they are sufficient to show the arrangement of the spindles in my machine and method of driving them.

In Fig. 2, B is the driving-shaft, and C is the disk or driving pulley. W is the spindle-

band passing to and around the spindles, and the letters *e e* designate the spindle-rails, which are shown also in Fig. 1.

In Fig. 3 is shown in front elevation a frame comprising two frames or standards, A, in which is more clearly seen the lift-rail *q*, on which the bobbin *r* rests, and whose up-and-down movement, carrying the bobbin with it, operates to guide the thread onto the bobbin *r*. Only three spindles are shown in this Fig. 3, but enough to illustrate the principle of my machine. The lift-rods 3 are to be seen also in Fig. 3, likewise the main driving-shaft *a*, geared by miter bevel-wheels *b b*, which turn the vertical shafts B. Motion is given from these shafts B to the shafts D through the worm and wheel *d*, and from thence motion is given to shaft F′ by means of bevel-gears *j i*. On said shaft F′ is the friction-pulley F, which drives the leather V-grooved draw-pulley H. Fig. 4 is a detached view of the V-grooved draw-pulley H, turning on the pin *w*, which is fast in the arm G. The arm G is connected to the fixed shaft E, on which it hangs loosely. (Also seen in Fig. 1.) The shaft F′ has fastened on it the friction-pulley F, which imparts motion to the V-grooved draw-pulley H, as before explained. The silk threads ride in the bottom of the groove in the said leather draw-pulley H. This prevents them from crossing each other on the pulley, and secures a more perfect twist.

In the diagram view, Fig. 5, I have shown the arrangement of driving-pulleys throughout the entire length of the machine, and as here illustrated the disk-pulleys C C′ serve to drive the entire series, or three rows of spindles located on opposite sides of the machine between the end frame, A, and next adjoining frame, A′. The disk-pulleys C′ C^2 drive the spindles which are contained between the frames A′ A^2. Disk-pulleys C^2 C^3 drive the spindles which are contained between the frames A^2 A^3. Disk-pulleys C^3 C^4 drive the spindles contained between the frames A^3 A^4. The spindle-band W passes around disk-pulleys C C′, the spindle-band W′ passes round disk-pulleys C′ C^2, and so on throughout the series, so that each of the disk-pulleys which are intermediate of the end pulleys drives two spindle-bands. To enable them to do so, I construct the intermediate pulleys with a dividing-flange, 3, upon their peripheries, midway of their height, so that each of said pulleys is made to contain an upper and a lower pulley-face, and each band thereon has its separate pulley-face, Fig. 6. The spindle-bands W W′, and so forth, are passed once around their respective pulleys, so that the bands cannot slip thereon. The pulleys are made tapering, as shown in Figs. 1 and 6. The rails *e e e* are arranged at increasing elevations, the inner ones successively higher than the next outer, for the purpose of facilitating the access thereto of the spinner, each inner spindle from this arrangement having a higher elevation than the one next without. The frames or standards A are made without an inward curve, 5, for the purpose of affording ready access to the spindles and threads, and to other parts, as shown in Fig. 1. The arm G being free to swing on the fixed shaft E, the pulley H is consequently free to adjust itself by gravity to the friction-pulley F.

It will be understood that each series of three bobbins—namely, two single-thread bobbins, *s s*, and one take-up bobbin, *r*—is provided with a set of pulleys, H F, mounted and driven as above described and shown.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the pulleys C, front bobbin-spindles, J, and middle and rear bobbin-spindles, *k*, and the band W, passing over the pulleys C and middle and rear spindles and around the front spindles, with the supporting-frame A, and suitable mechanism for conducting the threads from the middle and rear spindles to the front spindles, substantially as described.

2. The combination of the draw-pulley H, having a V-shaped face-groove, the pivoted supporting-frame G, and the pressure-pulley F, having a V-shaped periphery, with front, middle, and rear bobbin-spindles, and mechanism for revolving the pulley F and conducting the threads from the middle and rear spindles to the front spindles, substantially as described.

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Witnesses:
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