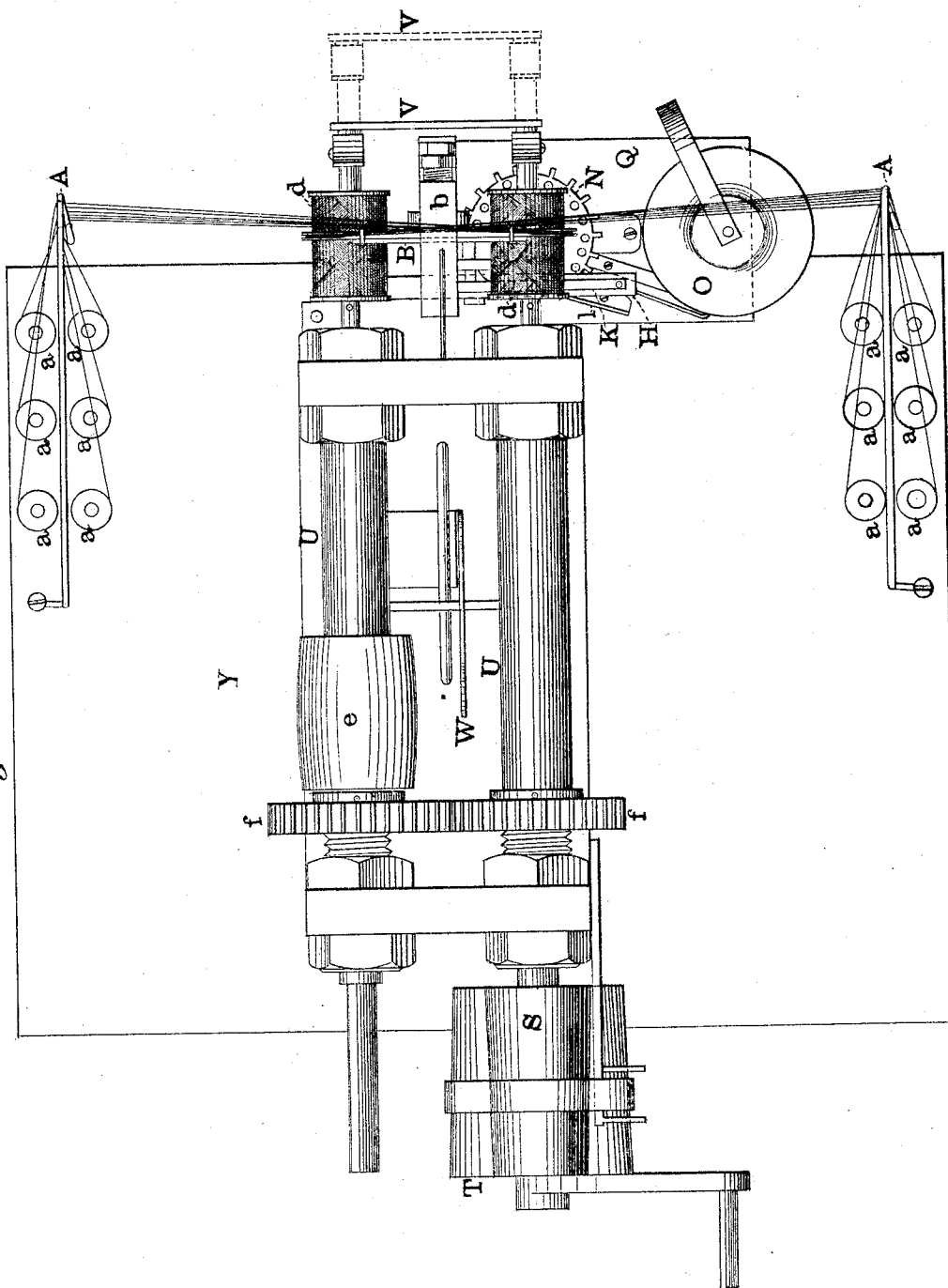


S. K. SMITH.
Spooling-Machines.

No. 146,210.

Patented Jan. 6, 1874.

Fig- 1



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John C. Sunbridge

Inventor
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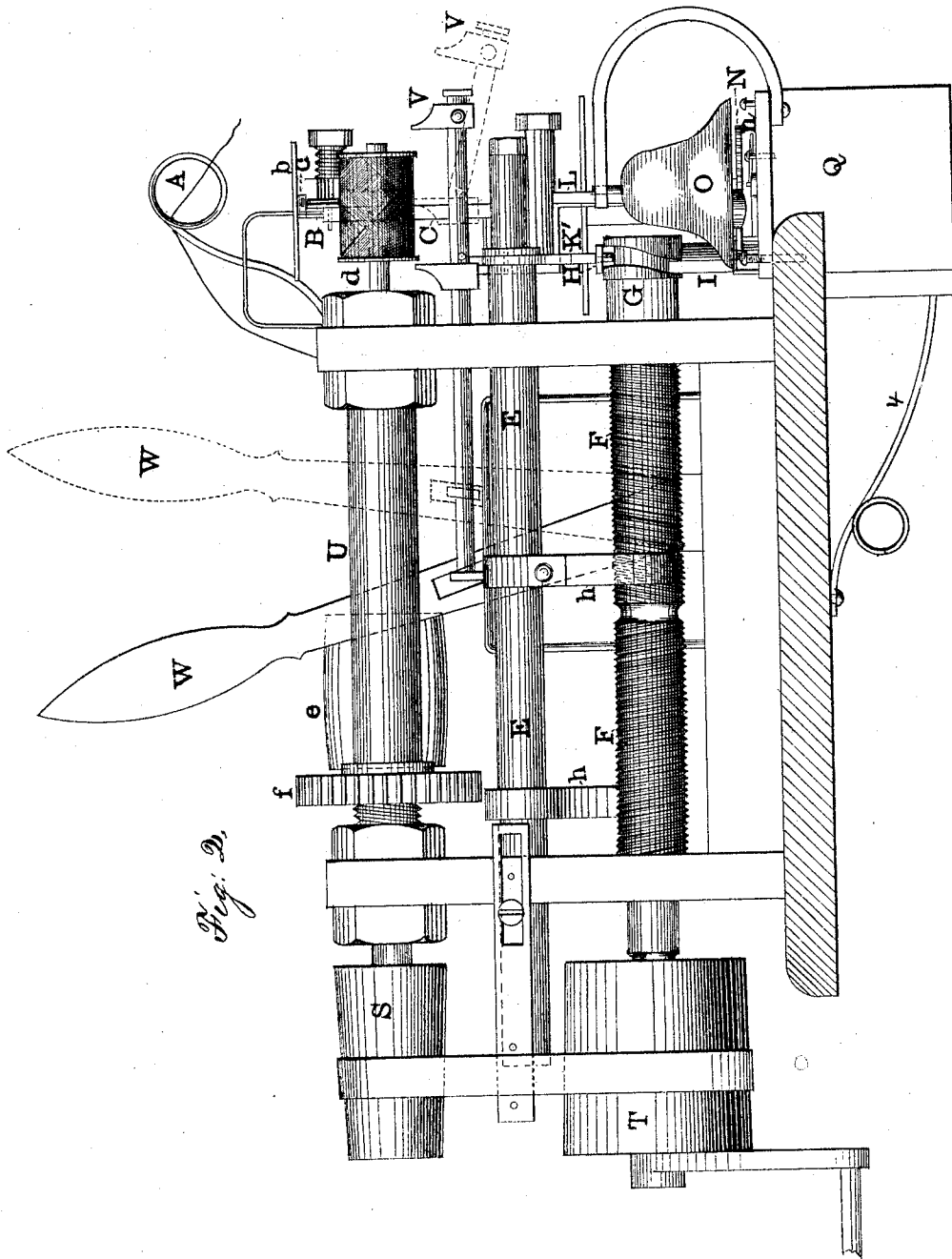


Fig. 2.

Witnesses
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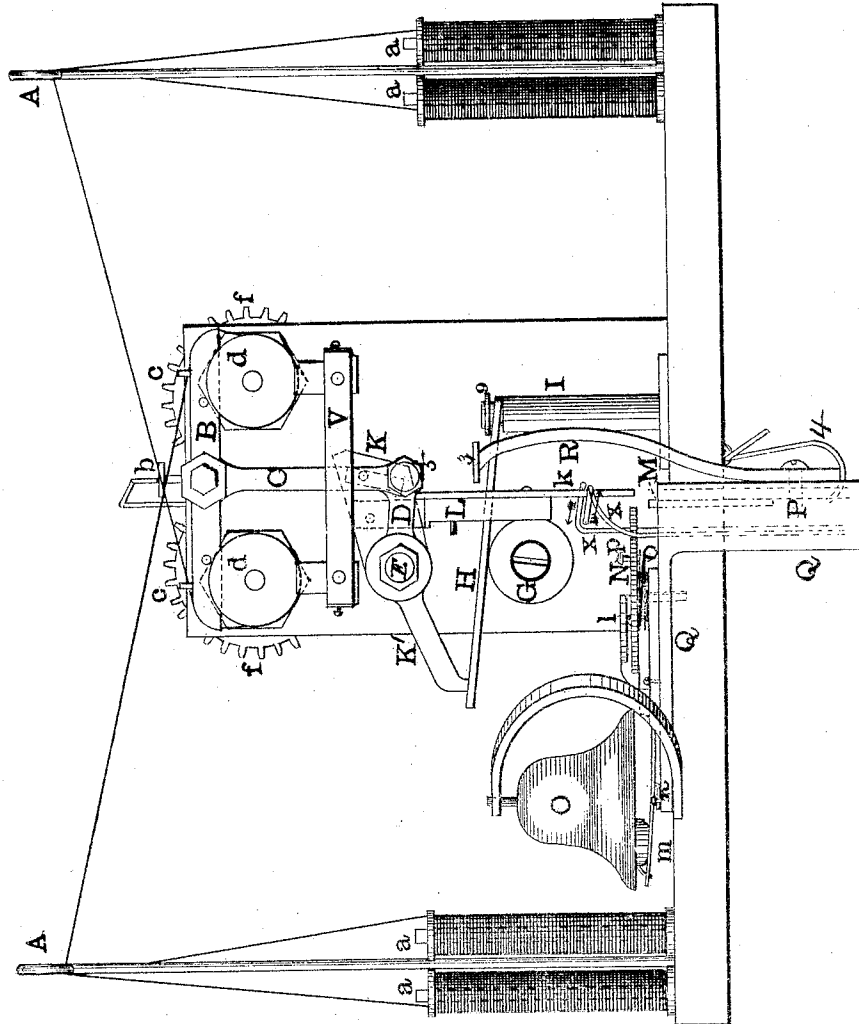
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Fig. 3.



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Fig. 4.

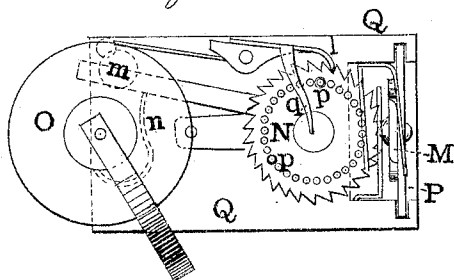


Fig. 5.

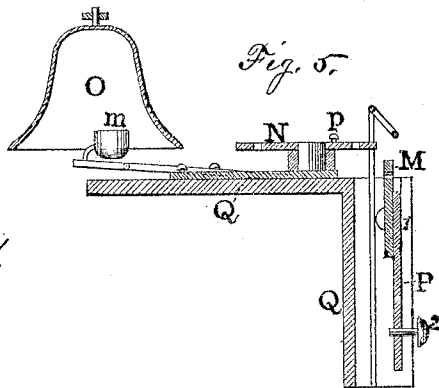


Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.

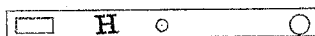
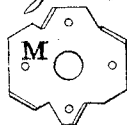


Fig. 10.



Fig. 11.



Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL K. SMITH, OF PATERSON, NEW JERSEY.

IMPROVEMENT IN SPOOLING-MACHINES.

Specification forming part of Letters Patent No. 146,210, dated January 6, 1874; application filed August 11, 1873.

To all whom it may concern:

Be it known that I, SAMUEL K. SMITH, of the city of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Spooling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

The nature of my invention relates to an improvement in spooling-machines; and it consists in, first, a combination of devices by means of which the length of traverse of the feeding devices is varied; second, an attachment, by means of which tailors' twist is plaited automatically while being spooled; third, the combination and arrangement of devices which will be more fully described hereafter.

Figure 1, Sheet 1, is a top or plan view of a spooling-machine constructed according to my invention. Fig. 2, Sheet 2, is a side view of the same. Fig. 3, Sheet 3, is a front view. Figs. 4, 5, 6, 7, 8, 9, 10, and 11 are detail views.

Y is a platform, upon which the machine is erected. Upon each side of the machine are placed vertical rods, upon which the bobbins are put, as shown at *a a*, containing the twist to be spooled, which is passed upward, through the eyes A, to the guide-plate of the machine. Journaled in the top of the frame are the two shafts, U placed side by side, and which carry engaging gear-wheels *f*. To one of these shafts is secured the driving-pulley *e*, and to the rear end of the other a cone-pulley, S, which transmits motion to the other parts of the machine. The front end of each of these shafts carries a spindle, which projects forward of the frame, and holds a spool, *d*. The shaft F, having a differential screw-thread cut in its surface, has a pulley, T, upon its rear end, through which it receives its motion from the cone-pulley S, and a wheel, G, upon its front end, having a cam-groove cut in its periphery. About mid-distance between the pulley-shaft U and the screw-threaded shaft F is a shaft or beam, E, from which hang downward two arms, *h h*, having screw-threaded ends, which bear against the

shaft F from opposite sides, and engage with the thread cut thereon. From the forward end of the shaft or beam E there projects a rocking arm, D, having secured to its outer end a vertical arm, C, which supports transversely the guide-bar B. This bar is long enough to extend a little beyond the sides of the two spools *d*, and has a longitudinal groove cut in its top edge, which serves as a guide to the thread as it passes to the spools. Upon the front end of the shaft E is secured a rigid arm, K, and downward from this arm projects an arm, L, to which is adjustably attached a finger, *k*. (Shown in Fig. 8.) To the front end of the platform Y is bolted a bracket, Q. (Shown in Figs. 4 and 5.) In the wall 1 of a chambered portion, Q', of the bracket is a slot, through which passes the pin 2. This pin serves to hold the plate P against the wall 1 in such a manner that it can slide freely up and down, carrying the pin with it. To this sliding plate P is secured the plate M, which consists of four unequal tapered projections from a central portion, the sides of each projection being tapered or beveled away, as seen in Fig. 11. To the outer side of the plate P is secured the bar R, having the plate or head 3 extending at right angles to it. Pressing upward against the lower end of the bar R is the spring 4, which keeps the plate 3 pressed up against the under side of the elbow 5, formed by the arms D C. The finger *k* is embraced by two springs, *xx*, which tend to force it alternately over the edges of the plate M.

The operation of the machine thus far described for spooling machine-twist is as follows: The bobbins, filled with twist to be spooled, are placed upon the vertical rods *a*, the threads led through the eyes A and grooves of the guide-bar B, and started on the spools at one end, the bar B being directly over that end. The machine is then started. The shafts U rotate the spools, and, as the threaded end of one of the arms *h* rests upon one part of the screw-shaft, said arm *h*, the shaft to which it is rigidly attached, and the arms D C, carrying the guide-bar B, will be moved in the direction in which the thread of the screw runs, at just such a regulated speed as will lay the twist evenly upon the spools. At the same time the finger *k* is moving along the plate M,

pressed closely against one of its sides by one or the other of the springs *x x*, until the finger passes the edge of the plate, when it is forced sidewise by the spring, and so brought across the edge, to the opposite side of the plate. The sidewise movement of the finger causes, through the arms *L*, a sufficient turn of the shaft *E* to throw off from the screw-shaft the arm *h*, till then engaged therewith, and bring the other arm against the opposite screw.

It will be readily seen that the operation is now reversed, and will continue thus to alternate as long as the machine is kept moving. The guide-bar *B*, resting lightly upon the spools, is carried upward by each succeeding layer of thread as the spools fill, drawing up the arm *C*, so that the bar *R* may be pushed up, and carry with it the plate *M*, whose broader portion is thus presented for the finger to travel around, and the layers of twist be thus gradually increased in length to correspond with the flaring shape of the spools. The sides of the plate *M* correspond with four regular sizes of spools, and the finger *k* being wider at one end than at the other, and also reversible, eight different sizes of spools may be wound with these devices.

Upon the upper surface of the bracket *Q* is arranged a ratchet-wheel, *N*, whose teeth are, one at a time, directly in the path of the finger *k* as it moves around the plate *M*, so that the wheel is moved one tooth each time two layers of thread are put upon the spools. Just inside of the toothed edge of the wheel is a row of perforations, one hole for each tooth. Pins *p* are adjusted in these holes, so that at any desired portion of a revolution one of said pins may strike the arm *g*, and thereby throw the pawl *l* out of engagement with the wheel, which then flies back to the starting-point, being carried back by the spring *o*, Fig. 3, which is for that purpose.

It is obvious that a certain number of teeth of the wheel *N* may be arranged to represent exactly the number of layers required to fill a spool; and, if a pin be inserted to strike the arm *g*, and also project through the wheel, as *p* is shown in dotted lines, Fig. 3, so as to strike the tail of the bell-hammer *m*, not only will the ratchet-wheel be returned to its starting-point, but the alarm-bell sounded to call attention to the fact that the spools are full.

I will now describe my devices which are used for spooling tailors' twist in the fancy or plaited style, which differs from the plain spooling in that, instead of the threads, singly or several together, being wound close together and directly around the spool, the coils are inclined first one way and then the other, crossing each other back and forth the length of the spool.

Upon the front end of the platform *Y* is a post, *I*, over the top of which fits the end of

the arm *H*, which is prevented from slipping off by the nut 9. This arm projects directly over the wheel *G*, which has the cam-groove in its periphery, and into this groove projects, from the under side of the arm, a stud or pin. In the end of the arm *H*, which extends beyond the wheel, is a slot, and into this slot fits the bent end of an arm, *K'*, which is rigidly attached to the guide-shaft *E*; but these two arms, *K* and *H*, are only connected when it is desired to spool tailors' twist in the plaited style, and at such time the plate *M* is lowered out of the way, as it is not then required, and the arms *h h* are secured from contact with the screw-threaded shaft.

Six, more or less, bobbins being now placed upon the vertical rods on each side of the machine, and their threads joined and led through the eyes *A* and the grooved guide-bar *B*, and started upon the spools, and the machine set in motion, the operation is as follows: The turning of the cam-grooved wheel *G* causes the arm *H* to vibrate quickly, and this arm, through its connection with the arm *K*, rigidly attached to shaft *E*, shifts the shaft in and out, and with it the guide-bar *B*, through the groove in which the twist passes on to the spools, as will be readily seen, in diagonal coils, which cross each other at acute angles back and forth.

By taking off the arm *H*, raising the guide-plate *M*, and properly adjusting the arms *h*, the machine is placed in condition to do plain spooling.

My arrangement for grooving the bar *B* consists in running an emery thread over it from a bobbin to a spool on one of the spindles, the spool being large if it is desired to cut rapidly, and small if slowly.

Having thus described my invention, I claim—

1. The combination of arm *R*, spring 4, plate *M*, and guiding devices, substantially as specified.

2. The cam-grooved wheel *G*, arm *H* with its stud, arm *K'*, and shaft *E*, supporting the guide-bar *B*, substantially as shown and described.

3. A spooling-machine, constructed substantially as described, for plain spooling tailors' twist, and having a plaiting attachment, substantially as set forth.

4. The combination of the perforated ratchet-wheel *N*, pin *p*, finger *k*, and spring-pawl *l*, having arm *g*, and the alarm-bell *O*, substantially as specified.

In testimony that I claim the foregoing, I have hereunto set my hand this 9th day of July, 1873.

SAMUEL K. SMITH.

Witnesses:

OLIVER DRAKE,

JOHN C. TUNBRIDGE.