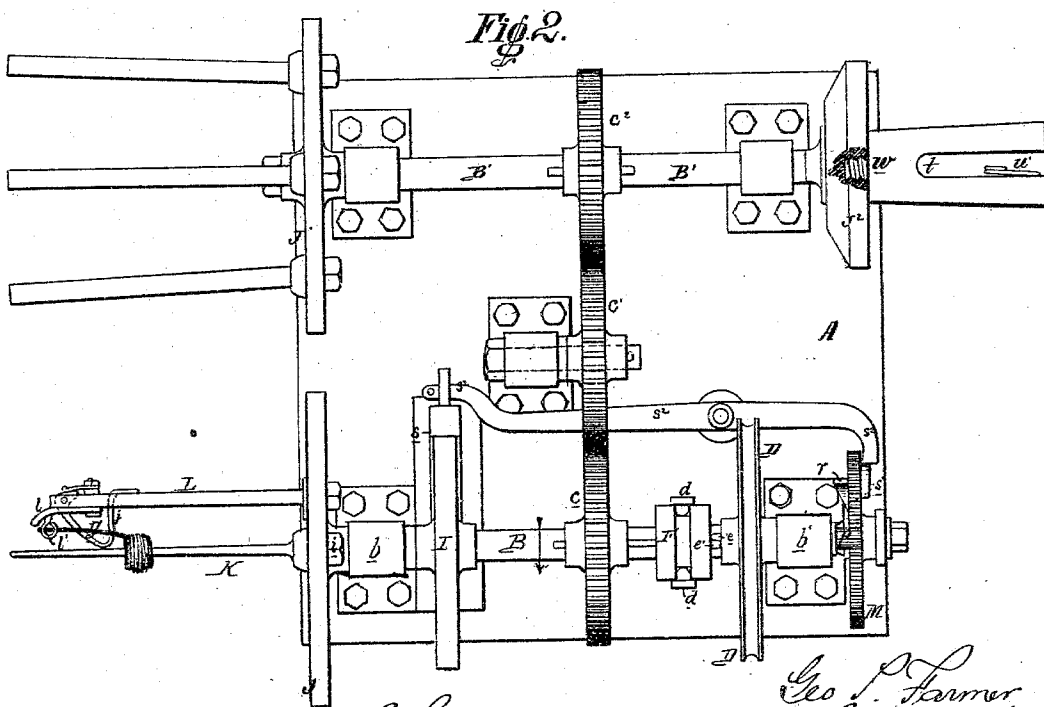
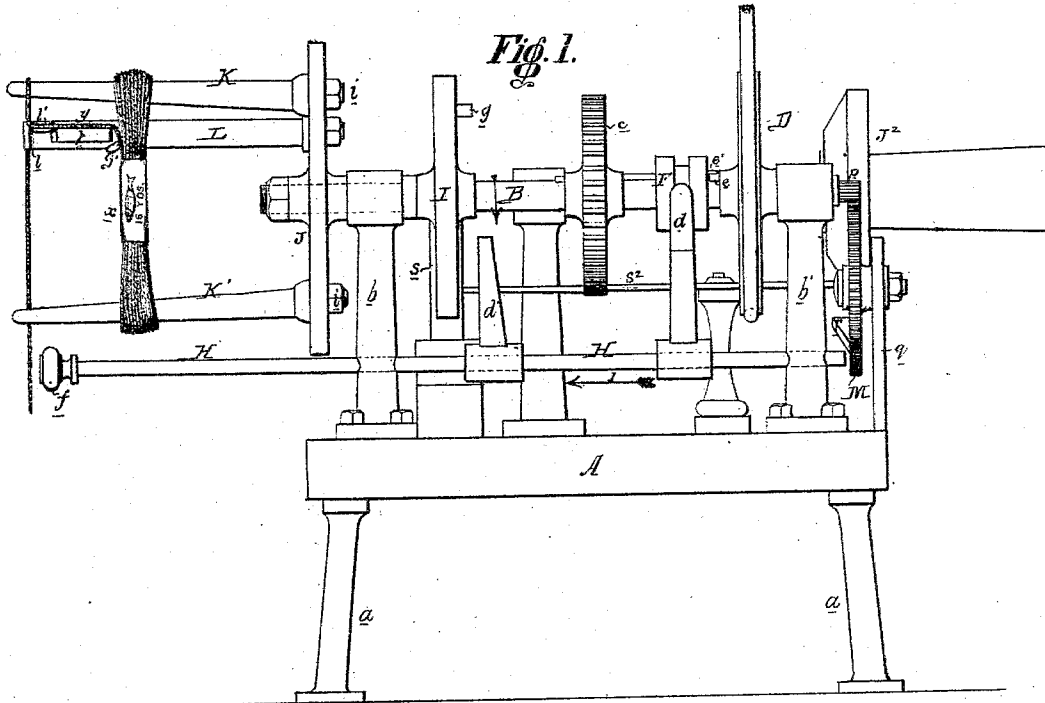


G. P. Farmer,

Winding Cord.

No. 102931.

Patented May 10. 1870.



Witnesses *Wm. A. Steel*
Geo. B. Harding.

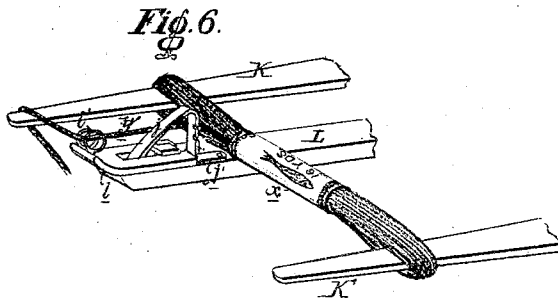
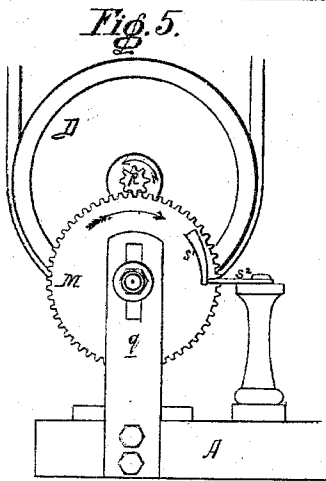
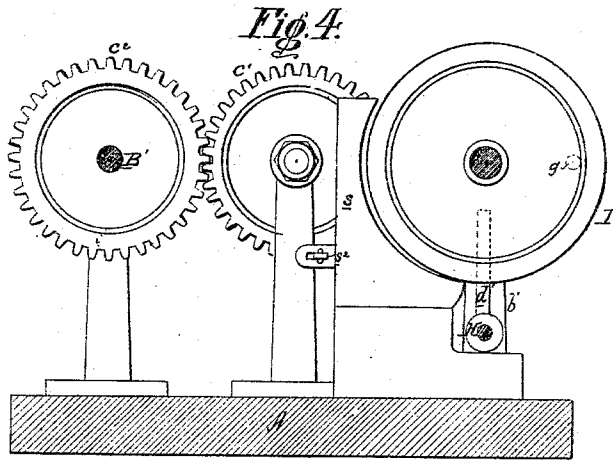
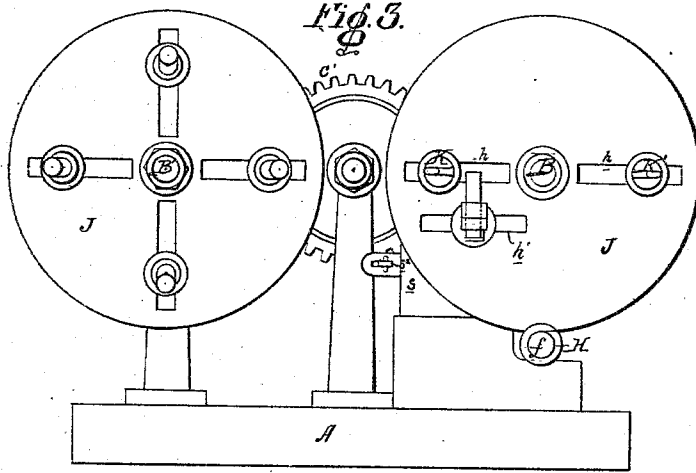
Geo. P. Farmer
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GEORGE PENRICE FARMER, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 102,931, dated May 10, 1870.

IMPROVEMENT IN MACHINE FOR FOLDING OR WINDING AND MEASURING CORDS, &c.

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

I, GEORGE PENRICE FARMER, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented a Machine for Measuring, Folding, and Wrapping Cord, &c., of which the following is a specification.

Nature and Object of the Invention.

My invention consists of an improved machine, fully described hereafter, for forming skeins of cord, tape, or fine wire of uniform measured length, and for enabling the coils of each skein to be tied together or fastened by a label, upon which can be marked the length of the skein and the name or trade-mark of the maker, &c., all as hereafter explained.

Description of the Accompanying Drawing.

Figure 1, sheet 1, is a side elevation of my improved machine for measuring, folding, and wrapping cord, &c.;
Figure 2, a plan view of the same;
Figure 3, sheet 2, an end elevation;
Figure 4, a transverse section on the line 1-2, fig. 1;
Figure 5, an elevation of part of the machine viewed from a side opposite that shown in fig. 3; and
Figure 6 a detached perspective view, illustrating the operation of the machine.

General Description.

The bed-plate A of the machine is, in the present instance, supported by legs *a a*, but it may either be secured to or form part of any suitable stand or table.

To this bed-plate are secured standards *b* and *b'*, in which are formed bearings for a horizontal shaft, B, the latter having a cog-wheel, *c*, by which, through the medium of other cog-wheels, *c'* and *c''*, motion is communicated to a second shaft, B', parallel with the shaft B, and also arranged to turn in standards on the bed-plate.

A driving-pulley, D, to which motion is communicated from an adjacent line of shafting, is hung loosely to the shaft B, but has projecting from its hub one or more pins, *e*, which, under the circumstances described hereafter, strike corresponding pins *e'* of a clutch, F, also hung to the shaft. This clutch is arranged to slide freely upon, but is prevented from turning independently of the shaft, so that when its pins engage with those of the driving-pulley, the motion of the latter must be communicated to the shaft.

The clutch is controlled by the forked arm *d* of a rod, H, which is supported by and arranged to slide longitudinally in the standards *b* and *b'*, and which has at one end a knob or handle, *f*.

The sliding rod H has also, in addition to the arm *d*, a second arm, *d'*, which is so arranged that when the driving-pulley is disengaged from the clutch, the said arm will strike a stop-pin, *g*, on one side of a

wheel or disk, I, of the shaft B, and thus arrest the motion of the latter, as hereafter explained.

The shaft B terminates at one end in a disk or face-plate, J, in which are cut two radial slots, *h h*, for the reception of the ends of two winding arms, K and K', which are made adjustable toward or from each other in these slots, and arranged to be secured after adjustment by means of nuts *i i*, adapted to their threaded ends. (See figs. 1 and 2.)

The winding-arms, which consist of flat, tapering strips of metal, do not project outward at right angles to the face-plate, but are slightly inclined in opposite directions, so that, as best observed in fig. 1, they shall be at a greater distance apart from each other at their outer extremities than at a point close to the face-plate.

In the face-plate, adjacent to the slot *h*, which receives the end of the winding-arm K, is formed another parallel slot, *h'*, to which is adapted an adjustable bar, L, somewhat shorter than the winding-arms.

To the outer end of this bar is hung a spring lever, *j*, of the peculiar bent form shown in figs. 2 and 6, and on the arm adjacent to this spring lever is an adjustable plate, *l*, to which is secured a wire, coil, or other cord-retaining device, *l'*.

The spring lever *j* has a constant tendency to remain in the elevated position shown in fig. 6, but when depressed it can be prevented from again rising by means of a small catch, *j'*, which is hung to the bar L adjacent to the spring lever.

The end of the shaft B opposite to that to which the face-plate J is secured, terminates in a small pinion, *p*, which gears into the teeth of a gauge-wheel, M, hung to and rendered vertically adjustable in a slotted standard, *q*, of the base-plate.

This gauge-wheel has on one side a cam-like projection, *r*, arranged, at every complete revolution of the said wheel, to strike the end of the sliding rod H, and push the same in the direction of the arrow, fig. 1, so as to disengage the clutch from the driving-pulley and move the arm *d'* into the path of the stop-pin *g*, and thus arrest the motion of the shaft.

In order to prevent too great a shock, and a consequent straining of the machine, when the pin *g* strikes the arm *d'*, the motion of the shaft is gradually slackened (after the driving-pulley is thrown out of gear) by means of a brake, *s*, acting on the edge of the disk I, and operated by a cam, *s'*, on the gauge-wheel M, through the medium of a lever, *s''*.

Operation.

The reel or reels containing the tape, cord, or fine wire, which it is desired to wind into connected skeins of a regular measured length, are arranged at any convenient point beneath the winding-arms K and K'.

Before commencing operations, the exact number of turns that the shaft B will make during one complete revolution of the gauge-wheel M is ascertained, and the winding-arms K and K' are then adjusted toward or from each other to a proper distance to form skeins of the desired length, which distance can be readily determined, as the number of turns of the shaft and winding-arms has been already calculated.

One end of the cord is then drawn from the reel and made fast between the coils of the holder V, after which the rod H is pushed inward toward the gauge-wheel M, so as to remove the arm d' from the path of the pin g, and to throw the clutch into gear with the driving-pulley, the shaft B then turning rapidly in the direction of the arrows and communicating its motion to the winding-arms, upon the ends of which the cord is wound as it is drawn from the reel.

When the skein is nearly completed, the cam r of the gauge-wheel will strike the end of the sliding rod H and push the same in the direction of the arrow I, fig. 1, which has the effect, as before described, of throwing the driving-pulley out of gear, and of moving the arm d' into the path of the stop-pin g.

At the same instant the cam s' of the gauge-wheel will so operate the lever s² as to force the brake s against the edge of the disk I, and thus retard the motion of the same, so that when the pin g strikes the arm d', which forms the positive stop, there will be little or no jarring of the machine.

The several parts of the machine are so arranged in respect to each other that when the motion of the shaft is thus arrested, the winding-arms, and consequently the skein which is formed upon them, will assume a horizontal or nearly horizontal position.

This facilitates the operation of tying the coils together, or, as I prefer, of binding them together by a paper label or tube, x, upon which can be marked the length of the skein and the name or trade-mark of the maker, as a guarantee of quantity and quality.

After affixing this label, the attendant slides the skein inward on the winding-arms toward the face-plate, causing it to depress the spring lever j of the bar L and to assume a position at the rear of the same, as shown in figs. 1, 2, and 6.

The tapering of the arms toward the face-plate immediately loosens the skein, when it is moved toward the latter, and thus prevents the said arms from offering any resistance to this movement.

The abrupt shoulder of the spring lever j prevents the return of the skein toward the ends of the arms, and (with the retainer V) determines the proper distance of the skein from the next which is to be formed, and the consequent length of the connecting portion y. The latter is also guided toward the retainer V by the said abrupt shoulder of the lever j, and is thus prevented from tearing the paper label x, which it might have a tendency to do if not thus guided.

The retainer V, as before mentioned, is attached to an adjustable plate, l, so that it can be readily moved toward or from the spring lever j, in order to determine the point at which each skein shall be wound upon the arms, and such adjustment will also affect the length of the connecting portion y.

When the machine is again set in motion, it is permitted to make the required number of turns, and is again stopped by the gauge-wheel and devices connected therewith, when a skein of precisely the same length as the first has been formed upon the winding-arms. This skein is labeled and pushed back in the same manner as the first, the connecting-cord made fast to the retainer, and a third skein formed, and so on until the required number of connected skeins, say twelve, is contained upon the winding-arms.

The spring lever j is then depressed and fastened by the catch j', after which the cord is cut, and the

whole number of connected skeins withdrawn from the arms prior to a recommencement of the operation.

To form skeins of a greater or lesser length than that described, it is only necessary to replace the gauge-wheel M by another having a greater or lesser number of teeth, and to adjust the winding-arms from or toward each other, as described.

The shaft B', or a train of shafts deriving their motion from and regulated by the shaft B, may be furnished at both ends with face-plates J and winding-arms K and K', so as to enable a great number of skeins to be wound simultaneously without having to employ a separate gauge-wheel and starting and stopping devices for each shaft. It is not necessary, however, that the precise arrangement of winding-arms above described should be adhered to, or that winding-arms should be employed at all, as this depends altogether on the character or form of the skein, hank, or ball to be formed. For instance, the face-plate J', at one end of the shaft B', has four radial slots h, from each of which extends a winding arm. These arms are tapered or inclined outward from the face-plate in the same manner as the arms K and K', and are arranged, in the present instance, to form a square of cord or thread, but they may be so adjusted as to form diamond-shaped or oval coils, or, when more than four arms are used, they can be arranged to form a variety of figures.

In some cases the arms may be covered with cardboard or thin wood, upon which the material can be wound in connected skeins just as upon the arms, and afterward removed from the latter together with the cardboard, which will serve to retain the coils in shape.

For forming circular coils I prefer to dispense with the arms and use an inwardly-tapering reel, such as that shown in connection with the face-plate J² of the shaft B'.

This reel has a longitudinal slot or recess, t, in which is arranged a cord-retainer, u', similar to the retainer V before described, and the said slot is of sufficient width to receive the paper tubes or labels while the latter are being affixed to the coils.

The reel has a threaded stem, w, or equivalent fastening, by which it may be secured to the face-plate in such a manner as to be readily detached from the same, for the coils are, in this case, withdrawn from the reduced inner end of the reel, instead of from the outer end, as in the case of the winding arms.

It will now be evident without further description that, by means of the above machine, skeins of a uniform and known measured length can be produced, while every facility is afforded for tying the folds of each skein together, or for affixing to the same a paper label or tube, upon which can be marked the length of the skein and maker's name or trade-mark, &c.

Another important feature of this machine is that it produces the measured skeins, connected one to the other, thus affording an opportunity to the retailer to sell one skein of a given length or any multiple of that length in one continuous piece, without the waste incident to articles cut into short pieces.

Claims.

1. The rotating arms K K', tapering or inclined outward from the face-plate to which they are attached, in combination with a cam-wheel, M, or its equivalent, operating in unison with the arms, and caused to arrest the movement of the same, as set forth, for determining the quantity of thread in each skein, wound upon the said arms.

2. The rotating arms K K', in combination with the lever j, plate l, retainer V, and catch j', or their equivalents, and so arranged that after a portion of thread has been folded to form a skein or skeins, the latter

are retained upon the arms in connection with the thread, and without interfering with the folding of the same into additional skeins, substantially as described.

3. The combination of the said rotating arms with a bar L and spring lever *j*, arranged to guide the connecting portion *y*, so as to prevent the tearing of the paper label *z*.

4. The combination of the said spring lever and bar L, with an adjustable plate, *l*, and cord-retainer affixed to the same, for determining the length of the connecting portion *y*.

5. The combination, with the revolving arms and thread-guide, of the arm L, adjustable in respect to the arms, for the purpose described.

6. The shaft B, carrying the disks I J, loose driving-wheel D, and clutch F, in combination with the sliding rod H, carrying the arms *d d'*, and operating as described.

7. The combination of the cam-wheel M or its equivalent, sliding rod H, its arm *d*, disk I, and pin *g*, operating substantially as described.

8. The combination, with the revolving disk J and its arms K K', of the disk I, brake-lever *s*², and cam-wheel M, or equivalent devices, whereby the rotation of the said disk J may be gradually arrested.

9. The within-described stopping and starting mechanism, when the same is made common to a series of machines connected by cog-wheels or other gearing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE PENRICE FARMER.

Witnesses:

HERBERT G. ARMITAGE,
ALFRED YOUNGMAN.