J. WAYLAND.

CLOTH MEASURING MACHINE.

No. 184,677. Patented Nov. 21, 1876.

Fig. 3.

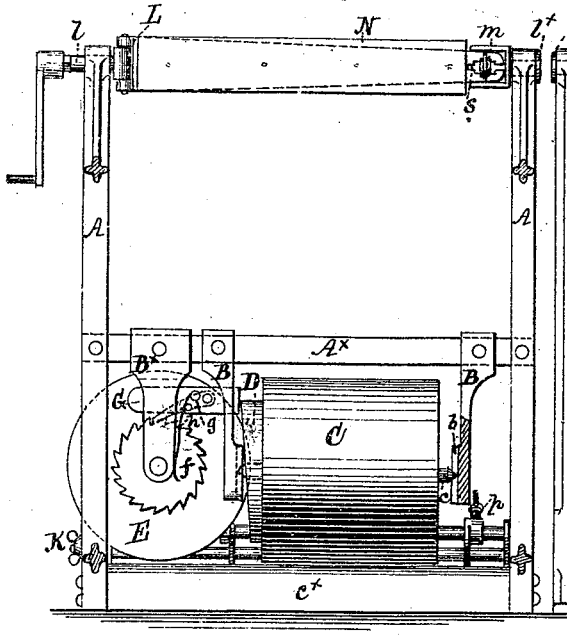


Fig. 1.

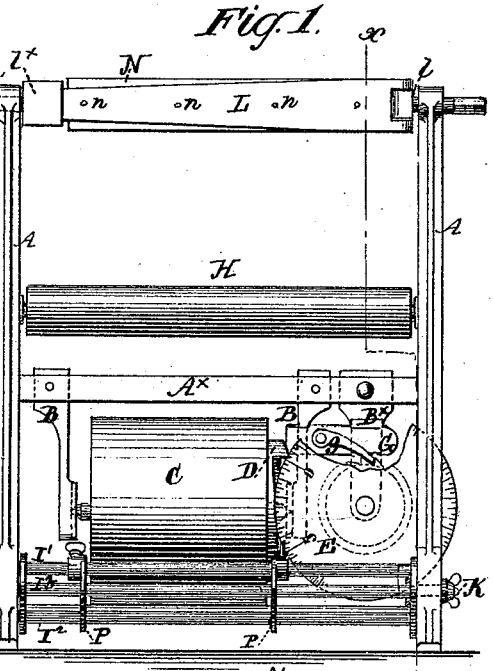


Fig. 2.

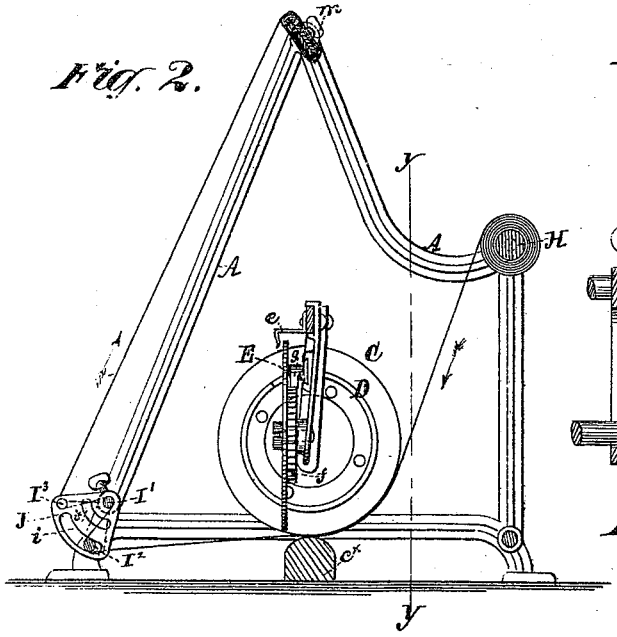


Fig. 5.

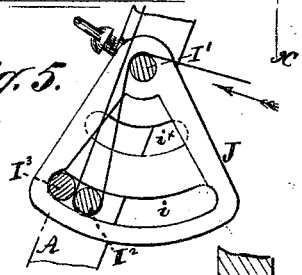


Fig. 6.

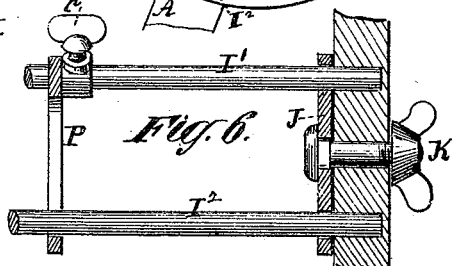


Fig. 4.

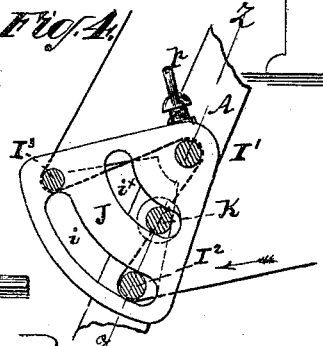
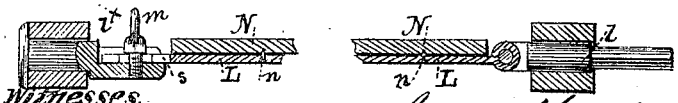


Fig. 7.



Witnesses,
John Becker.
Fred Haynes

James Wayland
by his Attorneys Brown & Allen

UNITED STATES PATENT OFFICE.

JAMES WAYLAND, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN HENRY COOKE, OF SAME PLACE.

IMPROVEMENT IN CLOTH-MEASURING MACHINES.

Specification forming part of Letters Patent No. **184,677**, dated November 21, 1876; application filed March 16, 1876.

To all whom it may concern:

Be it known that I, JAMES WAYLAND, of Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Machines for Winding, Measuring, and Inspecting Cloth; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention consists, first, in an improvement in the indicating mechanism, whereby, with a measuring-drum which rises and falls according to the different thicknesses of the materials to be measured, efficient provision is afforded for effecting accurate measurement. It also consists in a novel combination and arrangement of the measuring-drum, the tension devices, and the winding-shaft, whereby provision is made for one person to perform and control the operations of winding, measuring the cloth, and to inspect it during said operations.

The invention consists, further, in a novel construction of the tension device, whereby it may be adjusted to different positions, or arranged so as to smooth the nap of the cloth as it passes through the machine.

The invention consists, further, in a novel construction and arrangement of the winding-shaft, whereby facility is afforded for readily placing it in and removing it from its bearings, and provision is made for its ready connection with and detachment from a bolt-board.

The invention further consists in a novel mode of supporting the measuring-drum, whereby provision is afforded for keeping the cloth stretched to a proper degree between the said drum and the tension device, and the drum is caused to stop instantly when the winding stops.

To enable those skilled in the art to which my invention appertains to fully understand the same, I will proceed to describe it with reference to the accompanying drawing, which represents a machine constructed according to my invention.

Figure 1 is a face or front view. Fig. 2 is a vertical section taken in the line *x x* of Fig. 1. Fig. 3 is a rear view, partly in section, taken in the line *y y* of Fig. 2. Figs. 4 and 5 are detail views of the tension device. Fig. 6 is a section taken in the line *z z* of Fig. 4. Fig. 7 is a sectional view of the winding-shaft and its bearings.

The working parts of the machine are supported by a frame-work, A, which may be of any suitable construction and form, but is here shown as having its front side inclined upward to a position about over the center of the machine, by which means the cloth, after being measured and while being wound, is made to travel at an upward and backward inclination, so as to present it in the most favorable position for inspection of its surface. In the lower portion of the frame is a horizontal bar, $A^{\times}$, to which are attached two vertical bars or hangers, B, provided with bearings for the measuring-drum C. This drum is of the usual or any suitable construction, and may have its surface roughened. On one end of the drum is a cam or circular inclined plane, D, which may be formed with several inclined faces, if desired, but is here shown as formed with but one. The dial E is journaled in a hanger, $B^{\times}$, depending from the cross-bar $A^{\times}$, and the index or pointer *e* is attached to said hanger, so as to extend forward and downward in front of the dial. Attached to the rear side of the dial is a ratchet, *f*, with which engages a pawl, *g*, carried by a sliding bar, G. This bar works in bearings which may be provided in the hanger B or $B^{\times}$, or both. Its rear or inner end rests against the face of the cam D, being held in contact therewith by means of a spring, *h*, and said rear end is square and vertical, and wide enough to insure its continuous contact with the cam when the measuring-drum rises and falls in consequence of irregularities or varying thicknesses of fabric.

The cloth to be measured and wound may be already in a roll or bolt, or it may be wound upon a shaft or roller, H, arranged in bearings in the rear portion of the machine. The cloth passes between the drum C and a stationary bar, $c^{\times}$, and the passage of the cloth causes the drum to revolve in the usual manner. As the drum C revolves, the cam or circular inclined plane D imparts a longitudinal motion to the slide G in such direction as to

cause the pawl *g* and ratchet *f* to give a continuous rotary motion to the dial E. When the drum C has made a complete revolution, the end of the cam D, or top of the inclined plane, reaches the rear end of the slide G, and said slide immediately slips into the notch or shoulder, and drops to the foot or bottom of the inclined plane, ready for another forward movement as the drum continues to revolve. The distance traveled by the dial at each revolution of the drum is indicated on the dial by marks, and the spaces between these marks are subdivided into smaller spaces by shorter marks.

For example: Supposing the circumference of the measuring-drum to be one yard, the spaces between the longest marks on the dial will represent yards, and the subdivisions of said spaces will represent halves, quarters, and other fractions. As the motion of the dial is continuous, the exact quantity of fabric measured is indicated at all times by the proximity to the indicator or pointer of a mark on the dial corresponding with the quantity which has passed the measuring-drum.

After leaving the measuring-drum the cloth passes to the tension device, which is constructed and arranged as follows: In the lower portion of the front of the frame are two stationary round smooth rods, I^1 I^2, having their ends secured in the inclined portions of the frame. Two triangular plates, J J, are suspended from the upper rod I^1, so as to oscillate thereon, while a curved slot, *i*, in each plate, or an opening of suitable form, allows them to swing without interruption by the lower rod I^2. A rod, I^3, similar to the other two, has its ends rigidly attached to the plates J J, and thus the three rods are arranged triangularly with relation to each other. A clamping-screw, K, passes through the frame A, and engages with a slot, $i^\times$, in one of the plates J. By this arrangement the movable bar I^3 may be adjusted to different positions with relation to the bars I^1 I^2, so as to form either an equilateral or an isosceles triangle, and by means of the clamping-screw K it is held firmly in whatever position it is placed, and thus the tension is regulated at pleasure. One position of the rods is shown in Fig. 2, in which figure the line of travel of the fabric is indicated by a black line and accompanying arrows, and this position is shown more clearly in the detail view, Fig. 4. Another position is shown in Fig. 5, and when in this position the cloth passes between the rods I^2 I^3, which thus serve to smooth down the nap before winding the cloth into a roll or bolt.

After leaving the tension device the cloth passes to the winding-shaft, which is here shown as arranged in the upper and central portion of the machine, in order to provide for the inspection of the cloth, as before referred to.

The winding-shaft L is preferably of flattened form, and has its edges inclined or tapering from one end toward the other. One end of the shaft L is hinged to a journal or gudgeon, *l*, provided with bearings, from which it may be readily removed. The opposite end of the shaft is provided with a slot, *s*, for engagement with a locking device or button, *m*, carried by a journal or gudgeon, $l^\times$, provided with bearings in the opposite side of the frame.

By this construction and arrangement the winding-shaft may be readily connected with, and removed from, its bearings, by turning the button *m* so as to release the free end of the shaft, and then bending the other end on its hinge and withdrawing the journal or gudgeon *l* from its bearings. One end of the shaft may be provided with a crank or other means for turning it.

When the cloth is to be wound into a bolt, a bolt-board, N, is placed face to face with the shaft L, and the cloth is wound around both. When the bolt is completed and the shaft removed from its bearings, the tapering form of the shaft allows it to be easily withdrawn from the bolt, leaving the board therein. The shaft L may be provided with spurs *n*, sufficiently long to slightly enter the wood and prevent lateral displacement of the board, but not too long to prevent the withdrawal of the shaft.

The guides for the measuring-drum consist of grooves *b*, formed in the hangers B B, of corresponding form with the gudgeons *c* of the drum. These grooves extend sufficiently far above and below the gudgeons to prevent accidental displacement of the drum; but sufficient space is left between them and the cross-bar $A^\times$ to allow the drum to be lifted out when desired. The gudgeons *c* are here shown as conical in form, and the grooves *b* are V-shaped.

The adjustable guides for the fabric consist of triangular plates P, arranged to slide on the rod I^1, so that they may be moved nearer to, or farther from, each other, according to the width of the cloth. They are provided with clamping-screws *p*, for holding them in place when adjusted.

The advantage resulting from the use of the stationary bar $c^\times$, in connection with the rising and falling measuring-drum, is as follows: The stationary bar exerts sufficient strain on the cloth to keep it stretched to the proper degree between the drum and the tension device, and as soon as the end of the cloth reaches the bar, the drum immediately drops and rests upon said bar, and is prevented from rotating any farther, so that the motion of the indicating device ceases instantly, as soon as the measurement is completed, and the correctness of the measurement indicated is insured.

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

1. The combination, with the rising and falling measuring-drum C, of the cam D on the end of the said drum, the vertical-ended horizontal

slide G, the pawl *g*, the ratchet *f*, and the rotating dial E, having its face parallel with the axis of the measuring-drum, all as herein described.

2. The combination of the measuring-drum C, the tension-rods I^1 I^2 I^3, and the winding-shaft L, arranged relatively to each other substantially as herein described, whereby the cloth is made to travel at an upward and backward inclination, to afford facility for inspecting it while being measured and wound, substantially as herein set forth.

3. The tension device, consisting of the rods I^1 I^2 I^3, arranged triangularly and adjustable relatively to each other, substantially as and for the purpose herein described.

4. In combination with the hinge-joint at one end of the winding-shaft, the slot-and-button connection *s m* and permanent gudgeon $l^\times$ at the other end thereof, substantially as herein described.

5. The winding-shaft L, provided with the spurs *n*, and having its edges tapered toward one end, in combination with a bolt-board, substantially as and for the purpose herein described.

6. The stationary bar $c^\times$, arranged directly under the axis of the measuring-drum, and receiving the whole weight thereof through the interposed cloth, in combination with the vertical guides *b b*, receiving the journals or gudgeons *c c* of the said drum, substantially as herein described.

JAMES WAYLAND.

Witnesses:
BENJAMIN W. HOFFMAN,
FRED. HAYNES.