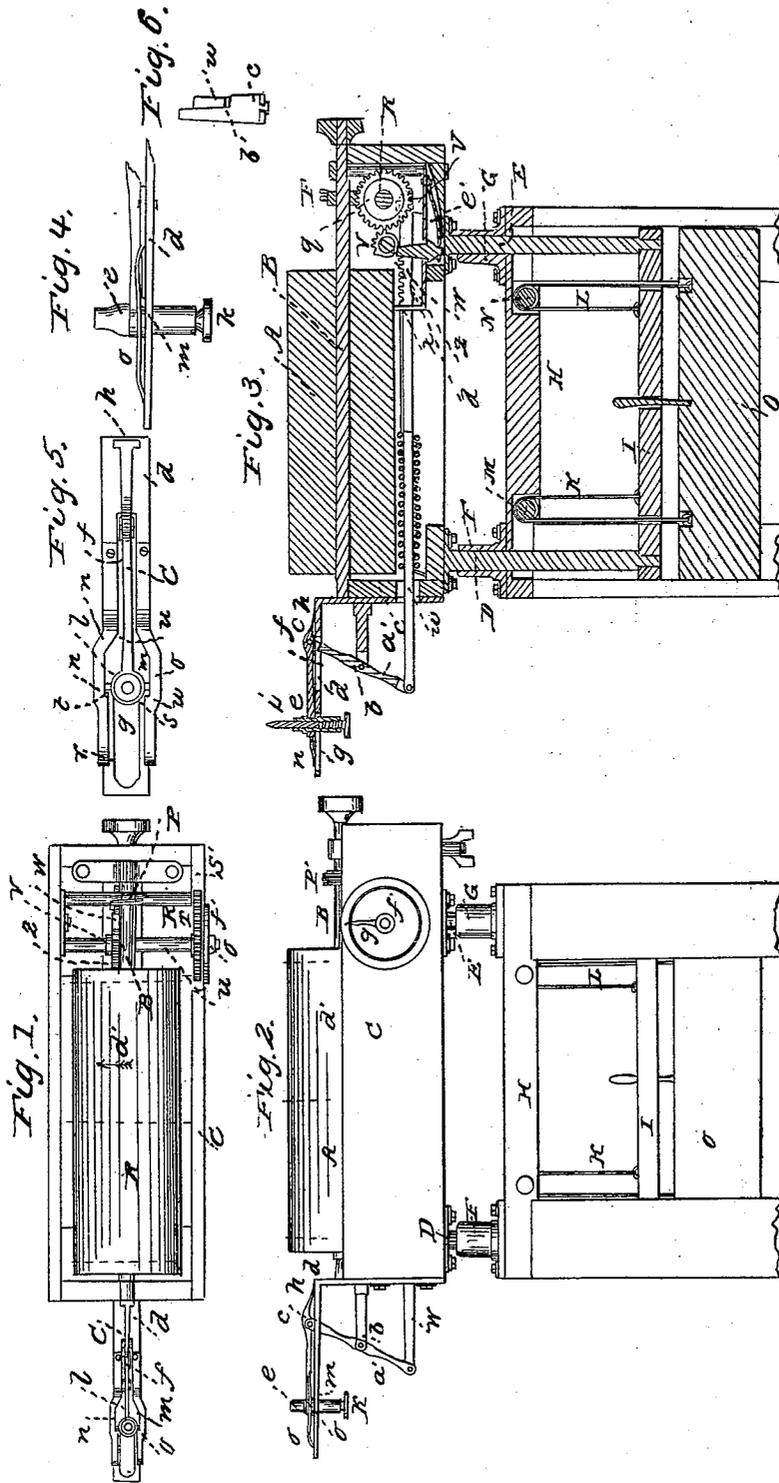


F. W. HOWE.  
Cloth Measure.

No. 4,556.

Patented June 6, 1846.



# UNITED STATES PATENT OFFICE.

FRED. W. HOWE, OF CHELMSFORD, MASSACHUSETTS.

## APPARATUS FOR MEASURING AND MARKING CLOTH UPON LOOMS.

Specification of Letters Patent No. 4,556, dated June 6, 1846.

*To all whom it may concern:*

Be it known that I, FREDERIC W. HOWE, of North Chelmsford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Machinery for Measuring Cloth on the Loom; and I do hereby declare that the nature of my invention and the manner in which it is constructed and operates are fully set forth and represented in the following description and accompanying drawings, letters, figures, and references thereof.

Figure 1 of the said drawings represents a top view of my machine, having its top plate or cover removed, and a portion of the front side of its case removed, in order to exhibit the internal construction and arrangement of various of the parts to be hereinafter described. Fig. 2 is a front side elevation of it. Fig. 3 is a vertical and central section of it.

In said figures, A denotes a cylindric roller mounted upon a horizontal shaft B, and having small teeth or points inserted in and entirely around its surface, and projecting therefrom, so that when said surface is rolled in contact with a piece of cloth the said points will enter the same, and prevent any slipping of the surface of the roller upon it.

The shaft B is supported so as to revolve in suitable bearings at the two ends of a box or case C, which partially surrounds the cylinder A, and is supported on the tops of two vertical rods D, E, which pass and move freely up and down through sockets F, G, fixed to the top of a suitable stand or frame H. The lower ends of the said rods, rest upon the upper side of a horizontal bar I, which is applied to the frame or standard H, in such manner as to be sustained by the frame, and to freely rise and fall or to move upward and downward therein. The said bar I, has two cords K, L, fastened to its top side. The said cords pass respectively over pulleys or sheaves M, N, (fixed in the frame H, so as to freely revolve) and at their other ends are attached to a counterbalance *o*, of sufficient weight to balance the bar I, and machinery resting and pressing upon it. An endless screw P, is placed upon the shaft B. The said screw works into a gear wheel Q, fixed below it and upon a transverse shaft R, as seen in Figs. 1 and 3. The said shaft R, has a toothed

pinion S fixed upon it, which engages with a large toothed wheel T, fastened upon another transverse and horizontal shaft U. At or near the center of the latter shaft is a wheel V, with a series of teeth or cogs projecting from a portion of its circumference only, the said portion being about one third thereof, as seen in the drawings. Directly beneath the said cogged wheel V, a long rack bar W is disposed, the said rack bar extending underneath the cylinder A, and being supported in such bearings at X Y as will permit it to slide backward and forward in the direction of its length. Upon the upper side of that part of the said rack bar, which is immediately adjacent to the wheel V, cogs or teeth are made as seen at Z, and which engage with those of the wheel V. The other end of the rack bar is jointed to a lever *a'*, which turns in a vertical plane and upon a fixed fulcrum at *b*. A horizontal spring bar *c* is jointed at one end to the upper end of the lever *a'*. The said bar at its opposite end rests upon a horizontal arm or guide plate *d* which is projected from the end of the box or case *e*, as seen in the drawings.

A small pencil tube *e* is secured to the spring bar *c* at right angles to it, and so as to stand vertically above it, and extend somewhat below it, and through the guide plate *d*, as seen in the drawings. There are two elongated slits or passages *f*, *g*, cut or formed through the guide plate, the former being for the upper arm of the lever *a'* to pass and move through, and the latter being to receive the pencil tube *e* and admit of its back and forth movements.

The bar *c*, has a spring *h*, projecting from its end which is jointed to the lever *a'*, the said spring resting upon the plate *d* and thereby keeping or pressing the opposite end of the bar *c*, down upon or toward the plate *d*. The pencil case or tube *e* carries a small crayon or piece of marking chalk *i*, which is placed in it and projects from it, and is made to rise by a screw R, adapted to the bottom of the case *e*, as seen in the drawings. Two small stubs or projections *l*, *m*, extend from the bar *c* on each side of the pencil case. A side view of one of the studs and the end of the bar *c*, and the pencil case is represented in Fig. 4, and a top view of the two studs and the mechanism on the top of the guide plate in Fig. 5 on an enlarged scale. Two springs *n*, *o*, of the

shape denoted in the drawings are arranged upon and fastened to the top of the guide plate before mentioned. Their ends which are nearest to the cylinder A, are riveted to the guide plate, while their opposite ends are bent or curved downward, and simply rest upon it, as seen in the drawings.

The springs *n, a*, are intended to act in connection with the studs *l, m*, and for this purpose, it will be perceived on inspection of the drawings, that they are so shaped as to project above the path of the said studs, for a short distance back from their ends which are bent down and rest upon the guide plate. The said springs are arranged at or near the said ends, parallel to each other and at a distance apart just sufficient to allow the end of the spring bar which carries the pencil tube, to move back and forth between them, and also to cause the studs when the pencil case advances toward the left extreme end of the guide plate, to pass underneath their respective springs or parts *p, q, r, s* thereof.

Each spring has a space *q, t, u v* or *s, w, x, y*, cut in it as seen in Fig. 5. The width *t, q*, or *s w* of this space is somewhat greater than the length of the stud *l* or *m*, immediately contiguous to it, and the shoulders *t q, s w*, are arranged in such a position, that, when the pencil case is drawn toward the cylinder A, to the extent of its motion, it shall carry the studs entirely over or beyond the said shoulders. The object of the springs *n, a*, and studs *l, m* is, to cause the pencil, when carried or drawn toward the cylinder A, to rise upward. This is effected in the following manner. When the pencil case is forced forward in a direction away from the cylinder A, the studs *l, m*, rest and move upon the top surface of the guide plate *d*, and pass underneath the projecting parts *q, q, r, s* of the springs, and when they come into contact with the bent ends of the springs and continue their movement they elevate the same until they have passed entirely by or beyond the extreme ends of the springs, or the parts *p, r*. When they so pass beyond the end of the springs the said ends fall down upon the guide plate. Consequently, whenever the pencil case is drawn back or toward the cylinder A, the curved ends of the springs form curved or inclined planes for the studs to meet and rise upon, and thus raise the pencil case, which will be so raised until the studs are carried beyond the shoulders *q, t, s w*, and enter the openings *q t u v, s w x y*. This being effected, the reaction of the spring *h* will cause the studs to descend upon the guide plate. The reason of the aforesaid movement of the pencil case, will be hereinafter more particularly explained.

The rack bar W has a spring 2 applied to and acting upon it in such manner as to

throw that end of it which is attached to the lever *a'*, in a direction away from the vertical plane passing through the end of the cylinder A. A small cam or wiper *a''* is made to project from the shaft U, near the end of wheel V. The said cam when the shaft is revolved meets the upper end of a spring catch *b'*, and depresses it. A side view of the said catch, and the manner in which the rack bar W, rests upon it, are denoted in Fig. 6. It has a shoulder or seat *c'* for the rack bar W to rest and move on, and when said rack bar is drawn back and to the extent of its motion by the cogged wheel V, a notch *d'*, formed in it, is carried over the seat *c'* of the catch *b'* far enough to allow the catch, by the action of the spring *e'*, upon which it rests to throw the catch *b'* upward into it, and this should take place just before or at the time when one of the teeth upon the wheel V ceases to act upon the rack bar, and give it a back motion.

When the catch is sprung up into the notch of the rack bar, it holds the said bar in position until it (the catch) is depressed and forced out of the notch by the action of the cam or wiper *a''*. The cam should be so arranged upon the shaft U, that, at a proper time it will depress the spring catch out of the notch of the rack bar, and thus allow the spring to react and throw the rack bar forward, and by so doing draw the pencil case back. A graduated plate *f'*, and an index *g'*, are applied to the shaft U, in such manner as to denote the extent of revolution of the shaft, the plate being screwed or otherwise properly attached to the case *e*, and the index pointer being fastened to the shaft, as seen in the drawings.

The manner in which the above machine operates and is applied to the measurement of cloth as it is woven in a loom, and marks the cloth when enough has been woven to constitute a roll or piece, is as follows. It is set up to the loom so that the curved surface of the cylinder A, may rest in contact with the outer surface of the cloth wound upon the cloth beam of a loom, during the operation of weaving the said cloth, the roller or cylinder being previously turned around so as to bring the index pointer to its proper starting point on the graduated plate. This being the case the rack bar will be thrown forward by the spring *z* to its utmost extent, and thereby, by its action upon the lever *a'*, will have drawn back the pencil case to its utmost extent.

As the weaving process progresses, and the cloth beam continues to take up the cloth, the cylinder A, will be revolved with and by it, its curved surface moving at the same rate of velocity with which the curved surface of the cloth upon the cloth beam travels. As the cloth beam continues to re-

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volve and fill with cloth, the counterbalance weight attached to the case of the cylinder will allow the case to fall or descend in the proportion required, and will keep the cylinder in close contact with the cloth upon the beam.

The revolutions or movements of the cylinder A, turn the shaft B, and the endless screw thereon. Motion is thus communicated, through the several gear wheels Q, S, T, and their shafts to the wheel V, and in such manner (when the cylinder A. is revolved in the direction denoted by the arrow *a'* thereon) as to cause one of the cogs of the wheel V, to operate upon the teeth of the rack bar, and draw it back until they leave it, and it is held back by the spring catch *b'* as before described. In the meantime, the back movement of the rack bar, has caused an advance of the pencil case *c* to its utmost extent of movement upon the guide plate *d*, and carried it beyond the ends or points *p*, *r*, of the springs *n*, *o*. This being effected, the cylinder A will continue to revolve, until the cam or wiper *a''* depresses the spring catch *b'* out of the notch of the rack bar, the occurrence of which will allow the spring upon the rack bar to retract and instantly force the rack bar forward, and thus draw the pencil case back, which, while so moving, will be raised by its studs and the springs *n*, *o*, and so as to carry the point

of the pencil or crayon in it up against the cloth upon the cloth beam, and thereby make a short mark upon it. This said mark will denote the number of yards required to be measured, or the extent of the "piece" of cloth, or, in other words, will indicate the place where the cloth is to be cut by the folder, to give the required length to the roll or piece.

I am aware that a roller or cylinder and clock work have been combined and used for indicating the length of any surface, which the said roller or cylinder might be placed and moved in contact with; therefore, I do not claim such a combination of mechanism, but

That which I do claim as my invention, is—

The combination of the roller or cylinder and a marking apparatus, constructed and applied to it, and operating in conjunction with it, and so as to measure and mark the cloth woven upon the cloth beam of a loom, substantially in the manner as above specified.

In testimony whereof, I have hereto set my signature, this seventeenth day of January, A. D. 1846.

FREDERIC W. HOWE.

Witnesses:

BENJN. ADAMS,  
AUGUSTUS E. SPALDING.