2 Sheets—Sheet 1.

T. W. CLARK.

Measuring Attachment to Fulling Mills.

No. 209,229. **Patented Oct. 22, 1878.**

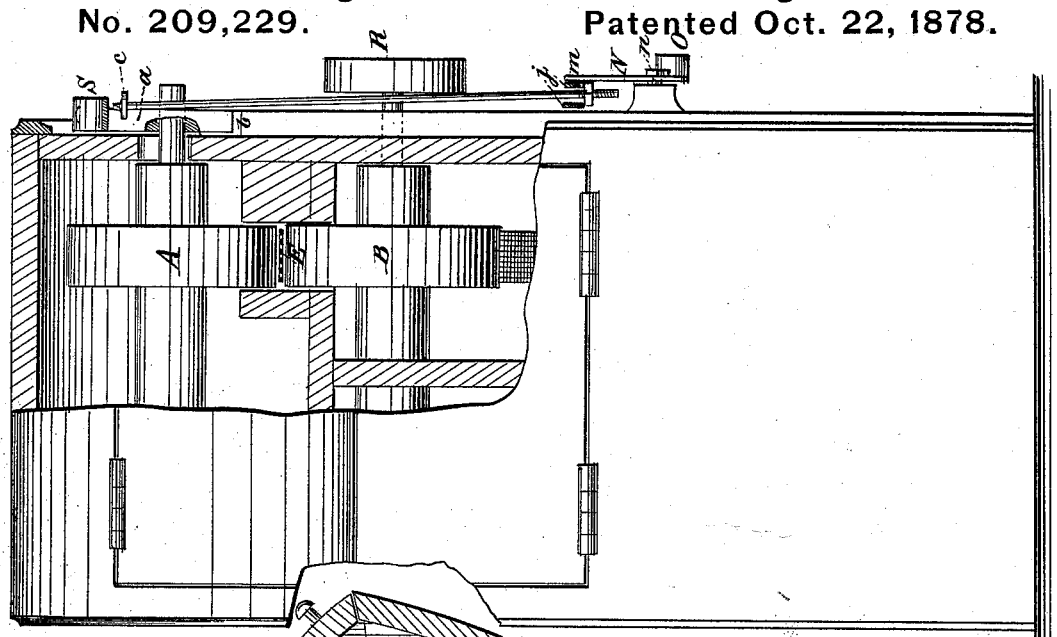

Fig. 4.

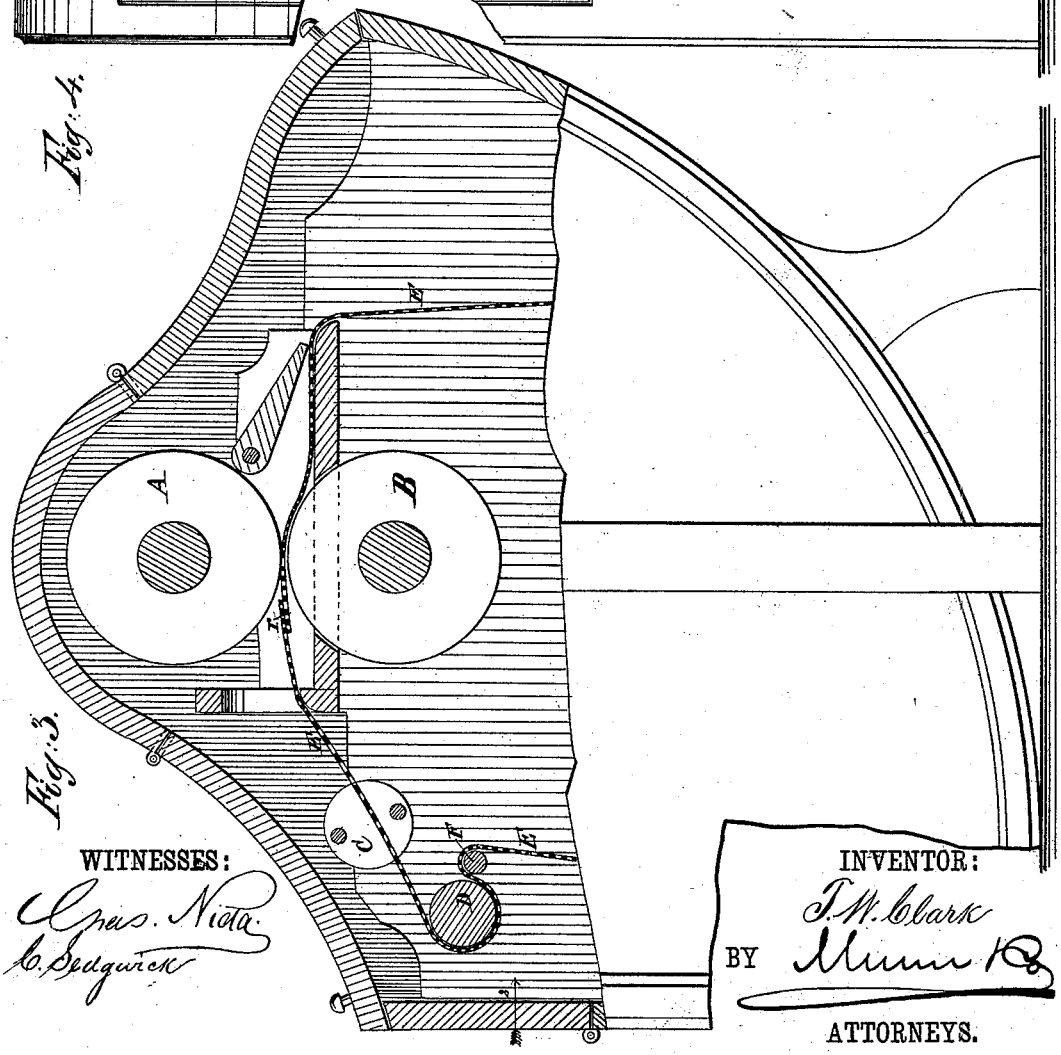

Fig. 3.

WITNESSES:

Chas. Nida.

C. Sedgwick

INVENTOR:

T. W. Clark

BY Munn & Co

ATTORNEYS.

2 Sheets—Sheet 2.

T. W. CLARK.

Measuring Attachment to Fulling Mills.

No. 209,229. **Patented Oct. 22, 1878.**

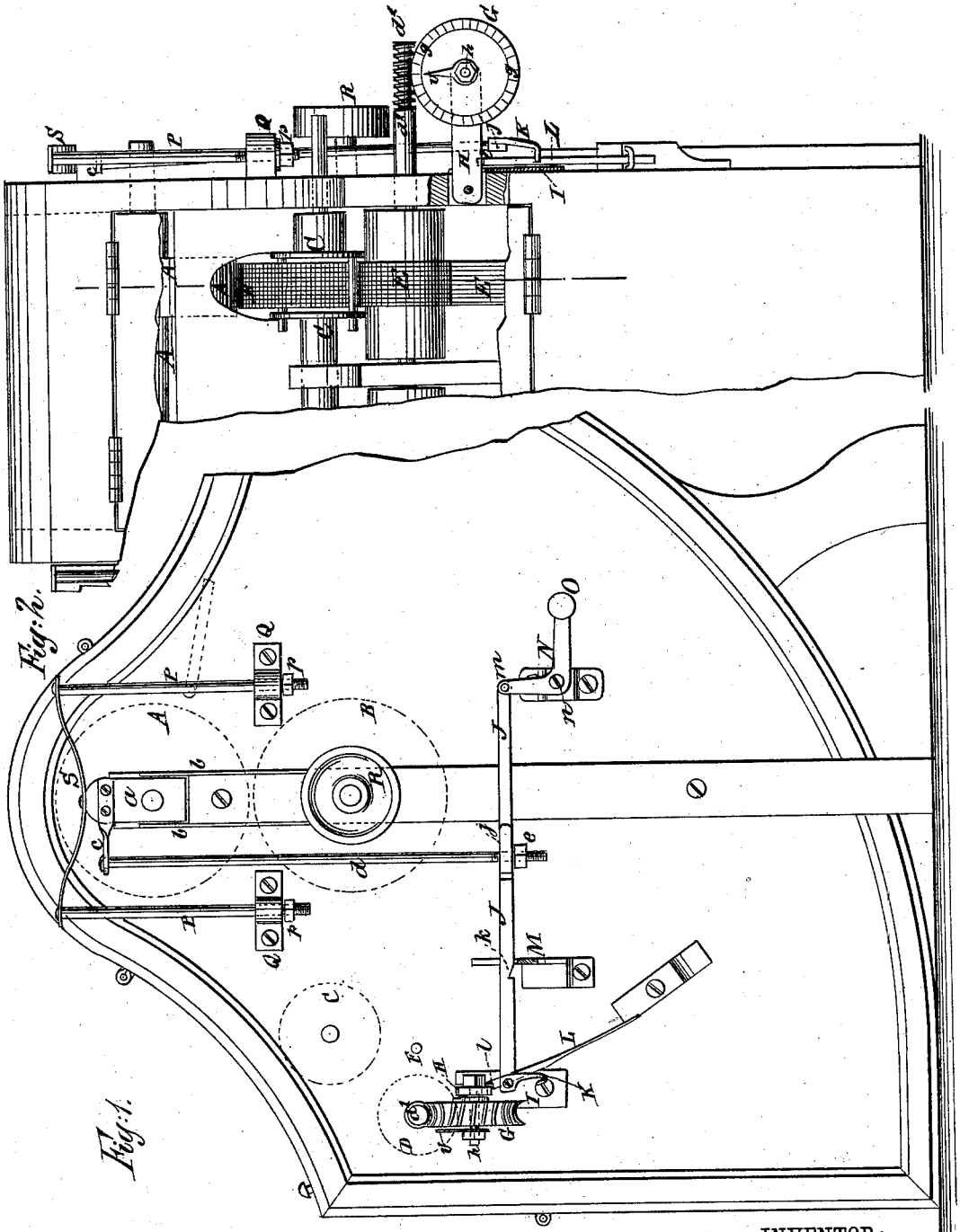

Fig. 2.

Fig. 1.

WITNESSES:

Chas. Nida.
C. Sedgwick

INVENTOR:

T. W. Clark
BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

THEODORE W. CLARK, OF OREGON CITY, OREGON.

IMPROVEMENT IN MEASURING ATTACHMENTS TO FULLING-MILLS.

Specification forming part of Letters Patent No. **209,229**, dated October 22, 1878; application filed August 22, 1878.

To all whom it may concern:

Be it known that I, THEODORE WARREN CLARK, of Oregon City, in the county of Clackamas and State of Oregon, have invented a new and Improved Measuring Attachment to Fulling-Mills, of which the following is a specification:

The object of my invention is to provide an automatic attachment to fulling-machines, whereby the length of the goods can be ascertained while being fulled, and the amount of shrinkage in length determined without removing the goods from the machine.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

In the accompanying drawing, Figure 1, Sheet 1, represents a side elevation of a fulling-machine provided with my measuring attachment. Fig. 2, Sheet 1, is a partial sectional end view of the same, seen in the direction of arrow 1. Fig. 3, Sheet 2, is a longitudinal vertical section of the same. Fig. 4, Sheet 2, is a sectional end elevation of the same, seen in the direction of the arrow 2.

Similar letters of reference indicate corresponding parts.

A and B are the two rollers of the fulling-mill, between which the woolen goods E are pulled along like an endless belt to circulate through the receptacle of the mill while being operated upon by the beaters. C is the tension device. D is a roller, arranged to be run by friction from the endless cloth E, being partly surrounded by the latter, which is held in contact with the roller D by the guide-roller F. The shaft of the roller D extends through the frame of the machine, and its outer end is threaded to form a worm, *d'*, suitable to gear in the teeth of a worm-wheel, G, which latter is fitted to revolve upon a stud, *h*, on the side of the free end of an arm, H, whose other end is pivoted to the frame of the machine, so that by raising and lowering the free end of the arm H the wheel G will be brought, respectively, in gear and out of gear with the worm *d'*. When lowered, the arm H rests upon the stop-plate I, secured to the frame.

The bearing *a* of the upper roller, A, is fitted to slide between vertical guides *b*, to allow the roller A to rise when the seam *r* (by which the two ends of the cloth are secured together) passes under it. The roller A is pressed down to its work by the elastic force of the elliptic spring S, which is secured with its center to the bearing *a* and with its ends to the rods P, the latter being inserted with their lower threaded ends through loops Q, (attached to the frame,) and fastened and adjusted to regulate the tension of the spring S by the nuts *p*, bearing against the under side of the lugs Q.

Through a hole in the end of the arm *c* (secured to the bearing *a*) is suspended a rod, *d*, whose lower end is threaded and goes through a slot or fork opening, *j*, in the bar J, a nut, *e*, on the lower threaded end of the rod *d* being in contact with the under side of the bar J. The bar J is connected by a pivot, *m*, at its rear end to the upright end of the elbow-lever N, fulcrumed at *n* to a bracket on the frame, and whose other end is provided with a weight, O. By raising the latter the bar J may be moved with its forward end underneath the arm H, which carries the worm-wheel G, and as it does so it releases the spring L, against which the projection K on the bar bears, and the notch *l* in the spring passes under the arm H, and sustains it in place to permit the worm-wheel to mesh with the worm *d'*. By lowering the weight O the bar J is drawn back, carrying the spring L with it, releasing the arm H, and throwing worm and worm-wheel out of gear. A notch, *k*, in the bar J catches on the stop-plate M and holds the bar, thus preventing the weighted lever from drawing it too far back and disarranging the parts. The wheel G has a circular scale of numbered marks, *g*, upon its face, each mark corresponding to the fractional turn of the wheel produced by the passage on the roller D (and between the rollers A B) of one yard of the goods E, the number being indicated by its juxtaposition to a stationary pointer, *v*, secured upon the end of the stud *h*.

It is well known to those acquainted with wool-manufacture that no two pieces of cloth, even if they are from the same warp and of exactly the same length when put into the fulling-mill, will full exactly alike, but that, in order to bring them both to a uniform width, it is often necessary to full one more in length than the other, thus causing a loss of yards in

length, and also a loss in weight, as the shorter piece must necessarily weigh more to the yard than the longer one, and, of course, this excess of weight is a dead loss to the manufacturer, who gets no more for the heavy goods than for those of the right weight. To obviate this difficulty, when a piece of cloth is put in the mill the bar J is thrown forward until the notch *k* catches on the stop-plate M, and when the seam *r* first passes between the rollers A B the arm H is thrown up, bringing the worm and worm-wheel in gear for the purpose of operating the dial-wheel. When the piece of cloth passes entirely through—that is, when the seam *r* passes the second time between the rollers A B—the rise of the former lifts the bar J, and the weighted lever drawing it back, the projection K strikes the spring L, knocking it from under the arm H, and throws the worm and worm-wheel out of gear, and the measurement of the cloth is indicated on the dial. The length of the cloth being thus ascertained at the start, the fulling process is allowed to go on, and the reduced length of the cloth is occasionally ascertained by throwing the indicator into gear until the proper shrinkage in length is reached. The tension C is then tightened on the cloth to prevent the latter from shrinking further on the length, but allowing it to continue shrinking in breadth until the desired width is reached.

In order to know the proper time to apply the tension C, a table is prepared, which shows at a glance to what amount a certain length of cloth should shrink in order to produce goods of a certain weight per yard. By thus ascertaining by the indicator when the proper shrinkage has been reached, and at that amount applying the tension C, there is effected a clear gain equal to the difference between the actual amount shrunk and the amount that it would have shrunk had there been nothing to ascertain and prevent it. By the use of this invention a manufacturer is also enabled to turn out any number of pieces of cloth of exactly the same weight per yard, which has heretofore been impossible.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The spring-pressed roller A, having the rod *d* connected to its sliding bearing *a*, the notched bar J, having the hook K, the weighted elbow-lever N, and the spring-catch L *l*, in combination with the dial-wheel G, pivoted to the arm H, the worm *d'*, and the roller D, run by friction-contact with the endless apron E, formed of the goods being fulled, substantially as and for the purpose set forth.

THEODORE WARREN CLARK.

Witnesses:
E. L. EASTHAM,
CHAS. H. CANFIELD.