

(No Model.)

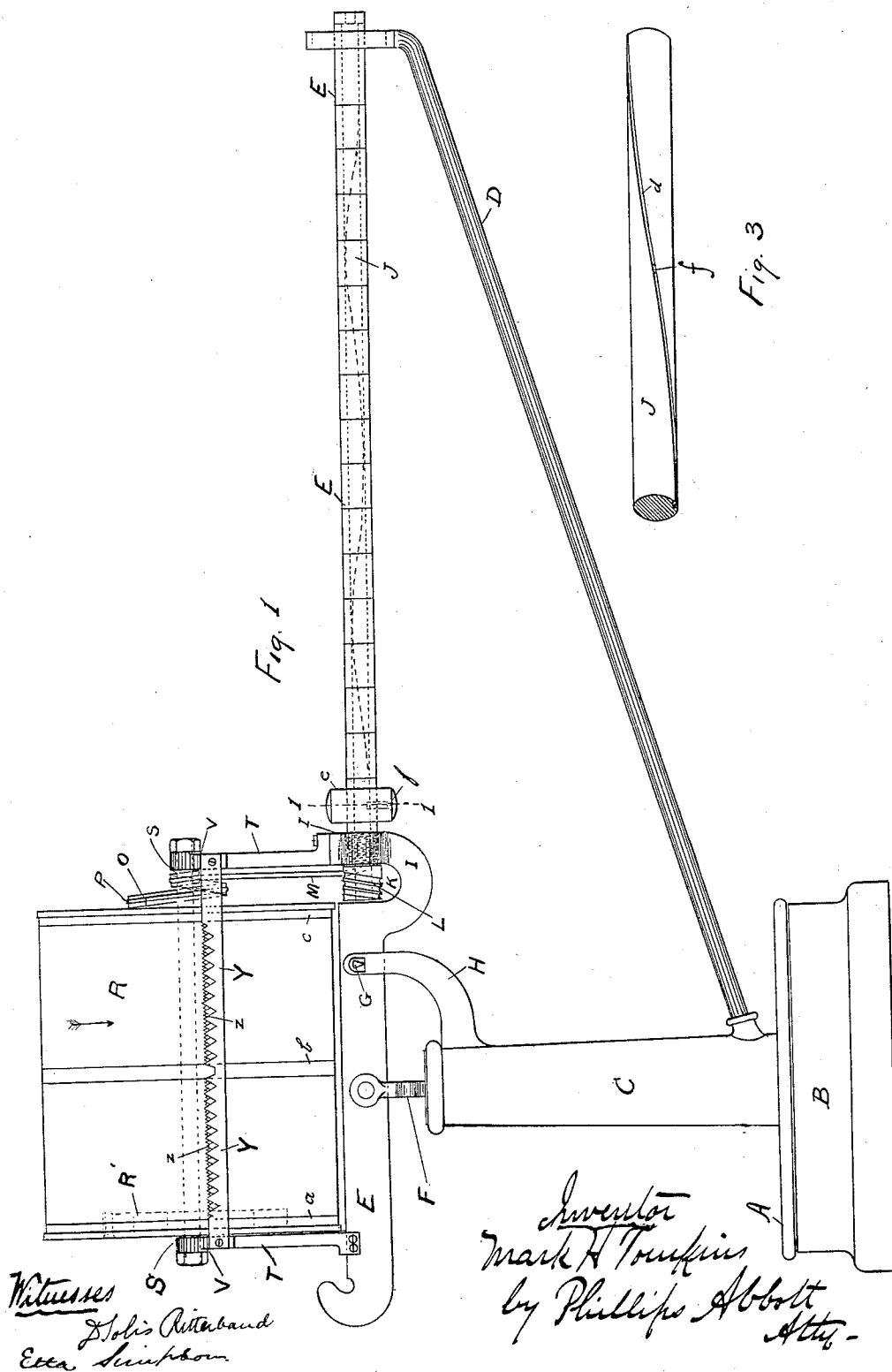
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M. H. TOMKINS.

APPARATUS FOR ESTIMATING TEXTILE FABRICS.

No. 552,596.

Patented Jan. 7, 1896.

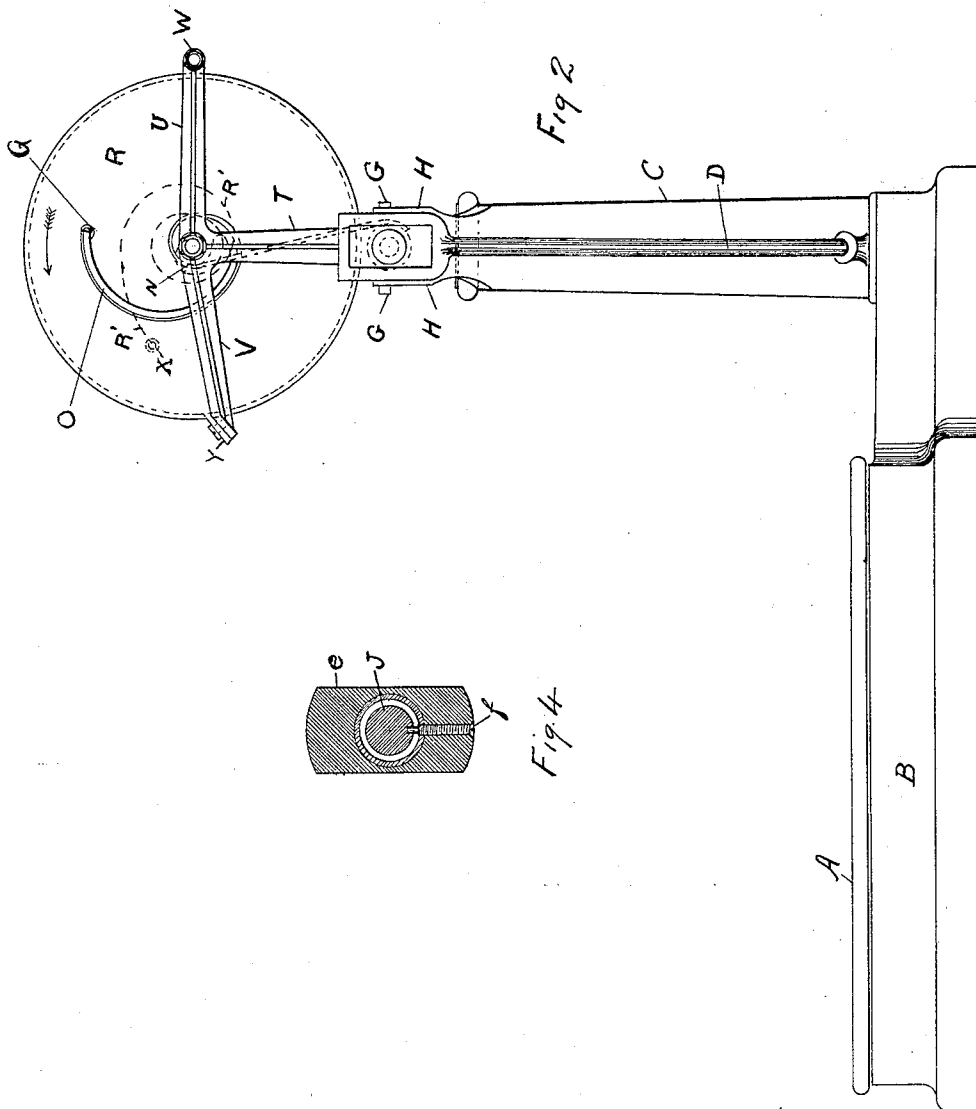


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Witnesses.
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(No Model.)

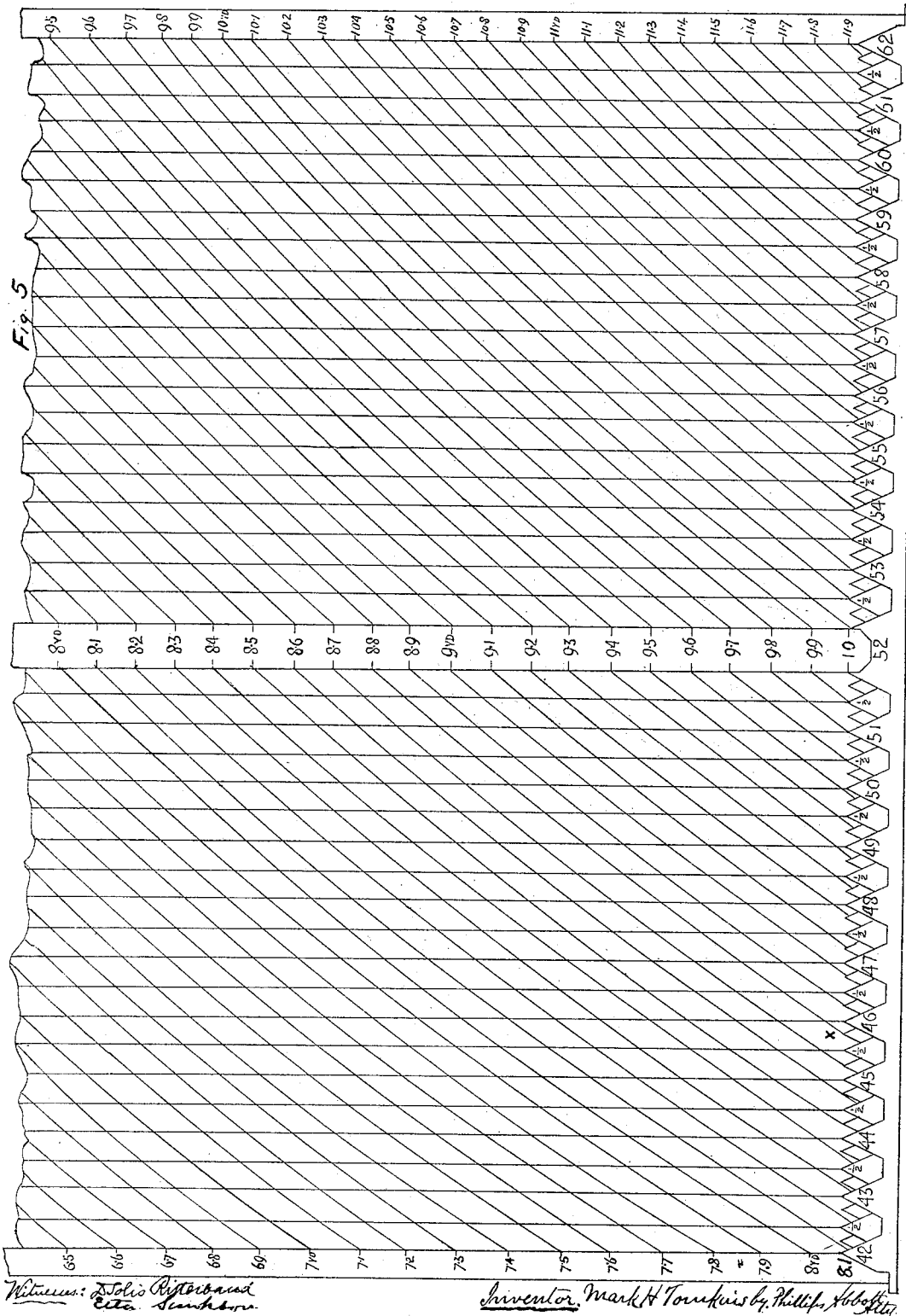
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UNITED STATES PATENT OFFICE.

MARK H. TOMKINS, OF NEW YORK, N. Y.

APPARATUS FOR ESTIMATING TEXTILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 552,596, dated January 7, 1896.

Application filed January 8, 1895. Serial No. 534,186. (No model.)

To all whom it may concern:

Be it known that I, MARK H. TOMKINS, a subject of the Queen of Great Britain, and a resident of New York city, in the county of New York and State of New York, have invented a certain new and useful Apparatus for Estimating Textile Fabrics, of which the following is a specification.

My invention relates to a new and useful apparatus adapted for use by manufacturers and dealers in textile fabrics.

At the present time and for many years it has been the custom by manufacturers of textile fabric to indicate on the end of the piece, bolt or cut of fabric the number of yards contained in that piece—as, for instance, on one of the corners of the fabric may appear the figures “47 $\frac{3}{4}$,” which is to read that the piece contains forty-seven and two-quarters yards. This is an instance only, taken from the print-cloth trade. The intent of that trade is to produce pieces or cuts containing fifty yards; but through shrinkage and other reasons it frequently falls short or slightly exceeds that amount.

In order to determine the quality of the goods—that is to say, its weight per yard, in other words, whether it is a closely-woven thick fabric or a loosely-woven or thinner fabric—recourse has been had to a method known more particularly in the print-cloth and cotton-weavers’ trade as “the yard-weight” system. In other words, they place a bale of goods upon an ordinary platform-scale and take its weight. Then they examine each piece or bolt and take off the yards indicated as above stated from the indications printed or stamped upon the respective pieces. They add them all together to get the total yards and divide the total weight in pounds into the total yards determined as aforesaid. This gives, as nearly as has been heretofore attainable, the weight per yard; but it will be noticed that this is the average weight on the whole bale of, say, forty pieces, bolts or cuts, but does not give the slightest indication of the yards per pound of each piece. To illustrate, assume, for convenience, that the bale comprises four pieces only (as above stated, there ordinarily will be forty pieces;) and each of these four pieces might weigh ten pounds, total weight forty pounds; or two of

them might weigh fifteen pounds each, and the other two five pounds each. The total weight is the same—forty pounds—and under the present system, all four pieces will be sold on a basis of ten pounds each, whereas the fact is that two of those pieces weigh three times as heavy in material and weaving, one or both, as the other two pieces. The above, of course, is an exaggerated instance; but it illustrates the principle.

The inexactness of the method of determining the yard weight of textile fabrics, by averaging the bale, as above set forth, has in recent years proved so unsatisfactory that a very large demand has arisen for some means of determining with more certainty the yard weight of each particular piece, bolt or cut, and the necessity for so doing has become so great in certain industries that the custom has arisen of putting each separate piece of fabric upon a scale and then by a laborious and time-taking process figuring out the yard weight of each piece. As will be seen, the ascertainment of the yard weight by the process last suggested is a matter of very considerable added expense in a factory where, in some cases, hundreds of thousands of pieces are annually produced.

Referring now to the subject-matter of my present invention, it comprises, generally stated, a machine or apparatus provided with a platform similar to the platform of an ordinary scale, adapted to receive a piece, bolt or cut of cloth, or a plurality of such pieces, as desired, and a balance-beam and indicating-drum, the beam and drum being connected together by certain mechanical appliances, so that upon the beam the weight of the piece can be instantly ascertained, and upon the drum the yard weight—that is to say, the number of running yards or fractions of a yard to the pound, which, as above stated, is known to the trade as “the yard weight” of the goods—is indicated. It will be observed, however, that this term is a complete misnomer. To say that a piece of goods runs 7.75 yards to the pound does not give the weight per yard. To ascertain that weight, a mathematical problem would have to be worked out, which would frequently be quite a complicated one. Nevertheless, this so-called “yard weight” is what the trade want, because

they wish to know the proportion in yards of fabric to the pound, since the raw material—to wit, the cotton—is bought by the pound, and my machine will fulfill this desire of the trade equally well whether the scale-beam, as will be hereinafter explained, be marked with indications giving the weight of the goods or not. I prefer to add such indications, because thereby the weight can be ascertained without extra trouble, and it may sometimes be convenient.

The mechanism constituting my apparatus or machine whereby I accomplish the foregoing is as follows, reference being had to the drawings forming part of this specification, in which—

Figure 1 is a front elevation of the apparatus. Fig. 2 is a side elevation. Fig. 3 is a detail of the rod which actuates the drum inclosed within the tubular scale-beam. Fig. 4 is a section of the pea and coacting parts, taken on the line I I of Fig. 1. Fig. 5 is a diagrammatical illustration of a segment of the face of the drum flattened.

A is the platform of what may be an ordinary platform-scale.

B is the box of the scale, within which the usual weighing-levers, &c., are employed.

C is the standard of the scale.

D is a brace extending from near the base of the standard to the very end of the beam E, to furnish the “arrests” therefor.

F is the connecting-rod which transmits the weight from the platform to the beam.

G are the usual knife-edge supports upon which the beam rests in a suitable bracket H.

The scale-beam has just forward of the supporting-bracket H a curved bracket I, into which the scale-beam proper E, which is hollow, is threaded, as shown. Within the hollow scale-beam and extending its entire length is a rod J. (See Fig. 3.) It is somewhat longer than the scale-beam and projects through a chamber or opening formed by the upwardly-turned end of the bracket I, and upon the end of the rod J, within this recess K, is located a hub L, preferably grooved spirally or wormed, so as to receive a cord, chain or band of any suitable construction,

preferably made of inelastic but flexible material, and such as will be influenced as little as may be by atmospheric changes. Such chain or cord is shown at M. This cord projects upwardly and is attached, as at N, to a cam O. The surface of the cam is grooved, as at P, from its lower portion N around the periphery of the projection of the cam, and the groove runs out at the apex of the projection, as at Q. The cord M rests in this groove and is wound onto or off from the cam, depending upon the direction in which it is rotated. The cam is rigidly fastened to the head of a drum R, and the drum and the cam both revolve upon a shaft S, which is rigidly fastened into supports T T, which at their base are supported on the beam. The supports T T have lateral branches U and V on

their upper ends. The branches U extend to the rear of the drum R, and their ends are connected by a cross-bar W, (see Fig. 2,) which acts as a distancing-piece to steady the supports and also as a guard to the drum to prevent its being shoved back against walls or other obstructions, which might mar it or interfere with its operation. The forwardly-projecting arms V V (See Fig. 1) are connected by a cross-piece Y, which constitutes the index-bar for the drum. The edge of this bar is made in the form of a series of properly-spaced points or indices. The periphery of the drum is provided with three circumferential flat tape-like surfaces *a*, *b* and *c*, upon which numerals are placed, as shown in Fig. 5, the purpose of which will be hereinafter explained, and the surface of the drum between these tabular index-surfaces is provided with lines, curved and straight, as will be also hereinafter explained, the curved ones being also gradually divergent, certain of which may be colored to more readily guide the eye. The rod J, which, as before stated, extends through the hollow scale-beam, is provided with a curved longitudinal slot or groove *d*, (see Fig. 3,) which, as shown in the drawings, is made upon the plan of a rifling or spline groove, and it makes, in the example shown in Fig. 1, two complete turns or spirals in the length of the rod.

e is the pea or weight for the scale-beam. It is adapted to slide longitudinally thereon, as usual, and on its under side there is a screw or tooth *f*, (see Fig. 4,) which projects upwardly, passing through a straight slot cut through the bottom of the tubular beam E, and the inner end of the screw or its equivalent enters and slides longitudinally in the groove *d* made in the interior rod J. The point of this screw, within the groove *d*, is shown in Fig. 3. It will be noticed, however, that in practice it is always upon the under side of the rod J, and not at its side, as shown in Fig. 3.

R' is a spring attached at one end to the fixed shaft S and at the other end, as at X, (see Fig. 2,) attached to one head of the drum. Its function is to return the drum, cords, &c., to their normal position at the expiration of the operation, as hereinafter explained.

It is obvious that a weight could be hung by a cord to the periphery of the drum, preferably dropped down on the back side of the machine, which would serve the same purpose as the spring, or other mechanical equivalents could be substituted.

The operation is as follows: The piece, bolt or cut of cloth the yard weight of which is desired is placed upon the platform of the scale and the pea is moved along the scale-beam until the counterbalance is secured, and by proper weight-indications upon the side of the weight-beam the weight of the cloth may be readily ascertained in the usual well-known manner. During the longitudinal movement of the pea the screw *f*, being

guided and sustained by the straight slot through the under side of the scale-beam, compels the rod J to turn upon its axis by reason of the engagement of the end of the screw *f* with the spiral groove in the rod J. This rotation of the rod J is communicated to the hub L on its end, and consequently the cord or chain M is wound up on that hub and proportionately unwound from the surface of the cam O against the stress of the spring R', which, of course, is put under greater tension by this operation. The drum R is consequently revolved in a forward direction—that is to say, toward the transverse index-plate Y. By utilizing the index-points on the plate Y, which are duly numbered, and the curved and straight lines on the face of the drum and the fingers on the index plates or ribbons *a*, *b* and *c* the exact number of yards or parts of a yard to the pound may be in a moment ascertained—that is to say, assume that the piece, bolt or cut of fabric is forty-five and three-fourths yards in length, (that is to say, the stamp put by the manufacturer on the corner of the cloth is in the figures 45 $\frac{3}{4}$.) Now, upon finding the position of 45 $\frac{3}{4}$ on the index-plate (see X) the operator sees the curved line, which coincides with the said index-point 45 $\frac{3}{4}$ on the plate Y, and following that upwardly he discovers in the nearest index-plate that that line runs up to 8.8. This shows that there are 8.8 yards to the pound in that piece of goods, and thus throughout the entire length. The index-plates Y and the drums will, of course, be provided with index-fingers and curved lines so divided and arranged as to fit the requirements or custom of each special industry. For instance, the cotton trade recognizes no fractions of a yard less than quarters, and their unit of weight, so to speak, is "the pound." Consequently, this apparatus is illustrated, in the drawings, as made upon the basis of one pound as the unit of weight and one-quarter of a yard as the unit of measure. For other trades or manufactures other denominations or arrangement may be necessary, which, of course, will have to be worked out to suit the necessities of each case.

The straight or truly circumferential lines shown on the drum in Fig. 4 are merely for the purpose of convenience in following the line of travel of the index-points. The proper index-point on the bar Y should stop between two of the curved lines. The operator in that event would judge of the relative increase in weight by the proportionate distance at which the index-point rested between the two contiguous curved lines.

Upon sliding the pea back to the base of the scale-beam, the spring R' immediately returns the drum to its normal position and gathers up and winds upon the cam the cord or chain M, thus likewise returning it to its normal position.

It will be noticed, special reference being

had to Fig. 5, that the curved and gradually-divergent lines on the drum have a coactive relationship with the cam and its peculiar shape, whereby the movement of the pea at one end of the scale-beam effects a materially different degree of rotation of the drum than an equal movement of the pea does at the other end of the scale-beam—that is to say, assume the pea to be moved one inch at the left-hand end of the scale-beam, the construction of the cam is such that there will be a resulting rotation of the drum of approximately three inches, whereas, if the pea be moved the same distance—to wit, an inch at the right-hand end of the scale-beam—the rotation of the drum will be not more than about five-sixteenths of an inch. Consequently it will be apparent that the curved lines must diverge, and their divergence must increase as they approach the portion of the drum farthest removed from the starting-point. The cam and the diverging lines are employed as shown, among other reasons, to avoid crowding of the lines, and also too great an extension of them; also, that the relative movements between the pea and the drum may be such as have been found most practically desirable. It has been found difficult to make the curved lines on Fig. 5 of the drawings with sufficient accuracy to show their divergence well; but upon counting the number of lines across the top of the figure as compared with the number across the bottom just above the index-plate it will be found that there are thirty-two of these lines at the upper part of the figure and thirty-nine at the lower part, thus showing that seven of them have been lost by reason of the said divergence.

It will be obvious to those who are familiar with such structures that various modifications may be made in the details of construction of the parts without departing from the spirit of my invention—as, for instance, the bar J instead of being of a size to fill the hollow tubular scale-beam may be much smaller in size and properly supported by proper bearings; also, the drum and the cam may be keyed to the shaft S and it made to oscillate in bearings on the tops of arms T; also, other suitable devices may be employed whereby the location of the pea will determine the degree of rotation of the drum. It is also obvious that my machine is adapted to making the stated determination relative to double cuts or bolts, and also relative to fabrics having very much greater or less weight than cotton goods, which form the subject of this illustration.

The present apparatus is adapted to employment with what is known as the "single-cut" piece or bolt of cotton goods, and the drum indicated a variance in yards (on a basis of quarter yards) of from forty-two to sixty-two yards, these being the extremes that will ever be met with in practical use. Of course the apparatus may be adapted to any other range.

Having described my invention, I claim—

1. In an instrument for determining the number of units, such as yards, relative to a fixed weight, the combination of a platform scale, a pea adapted to move longitudinally on the beam of the scale, a drum adapted to rotation, a cam connected to said drum, mechanism connecting the pea and the cam, whereby the movement of the former will affect the rotation of the latter, a stationary index plate, and curved and diverging indicating lines, and circumferential indicating tables on the drum, for the purposes set forth.
2. In an instrument for determining the number of units such as yards, relative to a fixed weight, the combination of a platform scale, a pea adapted to move longitudinally on the beam of the scale, a drum adapted to rotation, a cam connected to said drum, mechanism connecting the pea and the drum, whereby the rotation of the latter will be affected by the position of the former, a stationary index plate, curved and gradually

diverging lines, and also straight, circumferential lines, and indicating tables on the drum, for the purposes set forth.

3. In an instrument for determining the number of units, such as yards, relative to a fixed weight, the combination of a platform scale, a pea adapted to movement longitudinally on the beam of the scale, a rod located within the beam and connected with the pea, in such manner as to be oscillated on its axis by the longitudinal movement of the pea, a cord or chain, connecting said rod with a cam fastened to an indicating drum, said drum itself having indicating lines and tables, a stationary index plate, and means such as a spring, to return the parts to their normal position, for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 3d day of January, A. D. 1895.

MARK H. TOMKINS.

Witnesses:

PHILLIPS ABBOTT,
ETTA SIMPSON.