

No. 693,523.

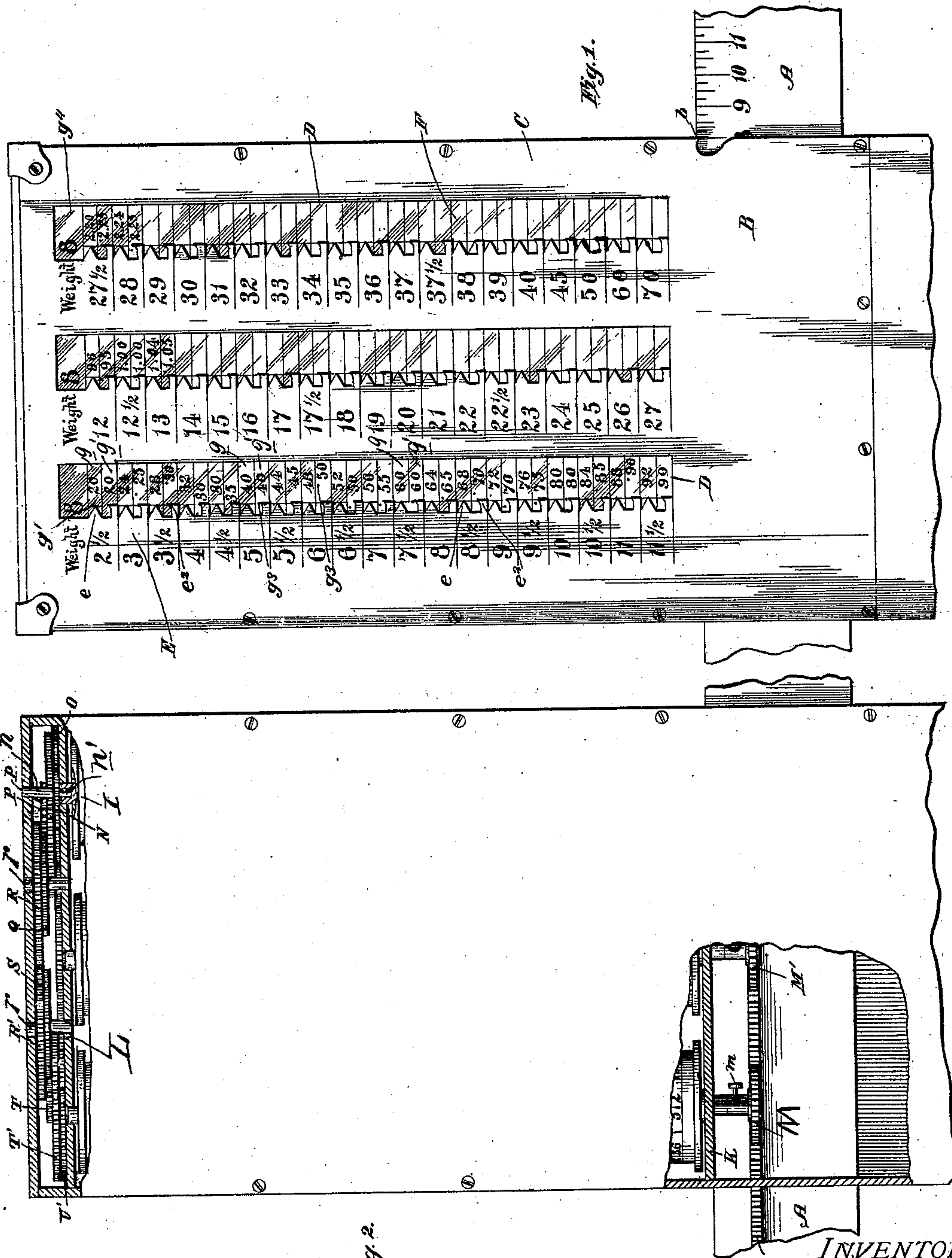
Patented Feb. 18, 1902.

M. F. KNOX.  
COMPUTING POISE FOR SCALES.

(Application filed Apr. 9, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

*Edwin Philips*  
*Chas. W. Parker*

Fig. 2.

BY

*Matthias F. Knox,*

*A. S. P. Macdon*

Attorney

No. 693,523.

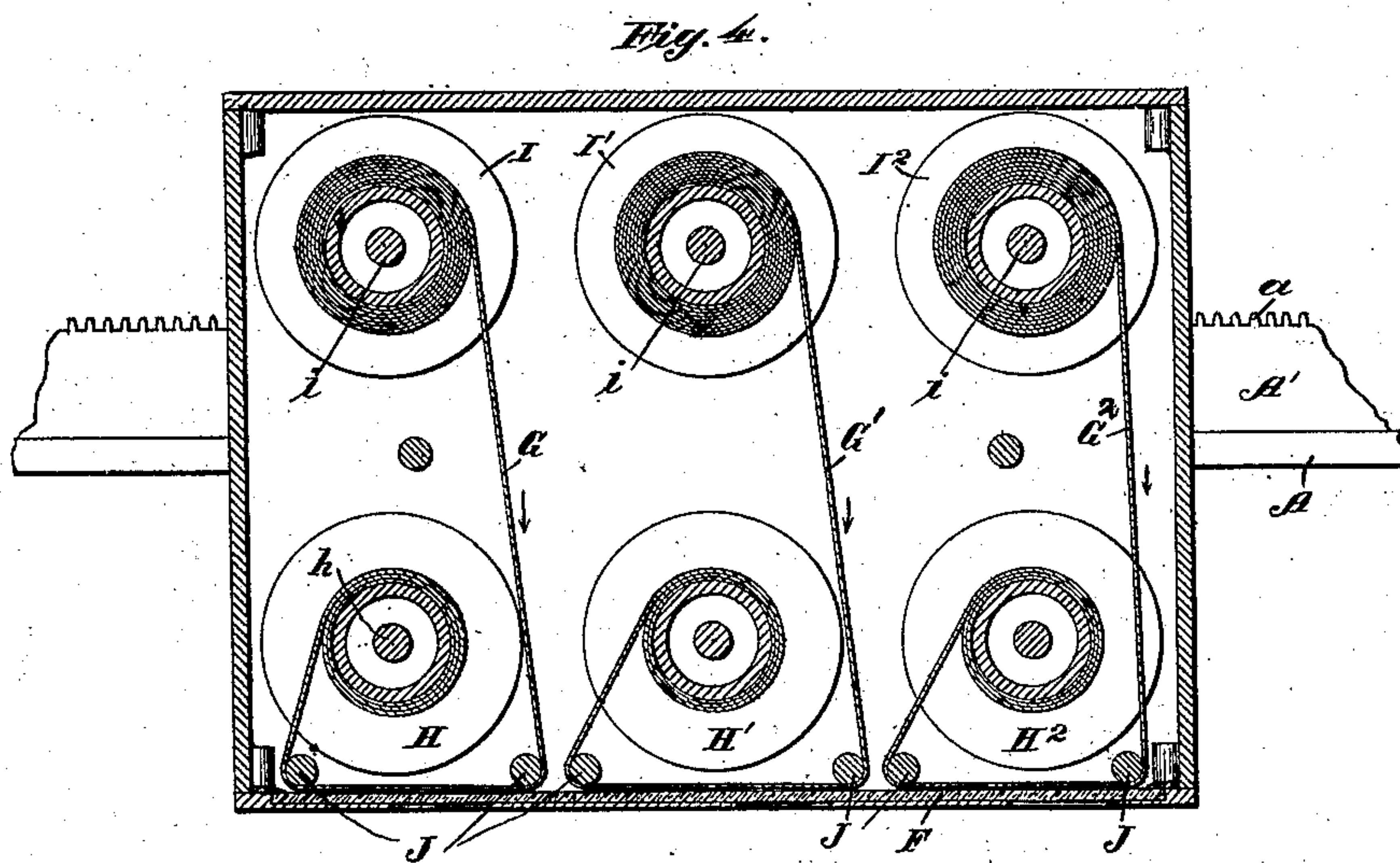
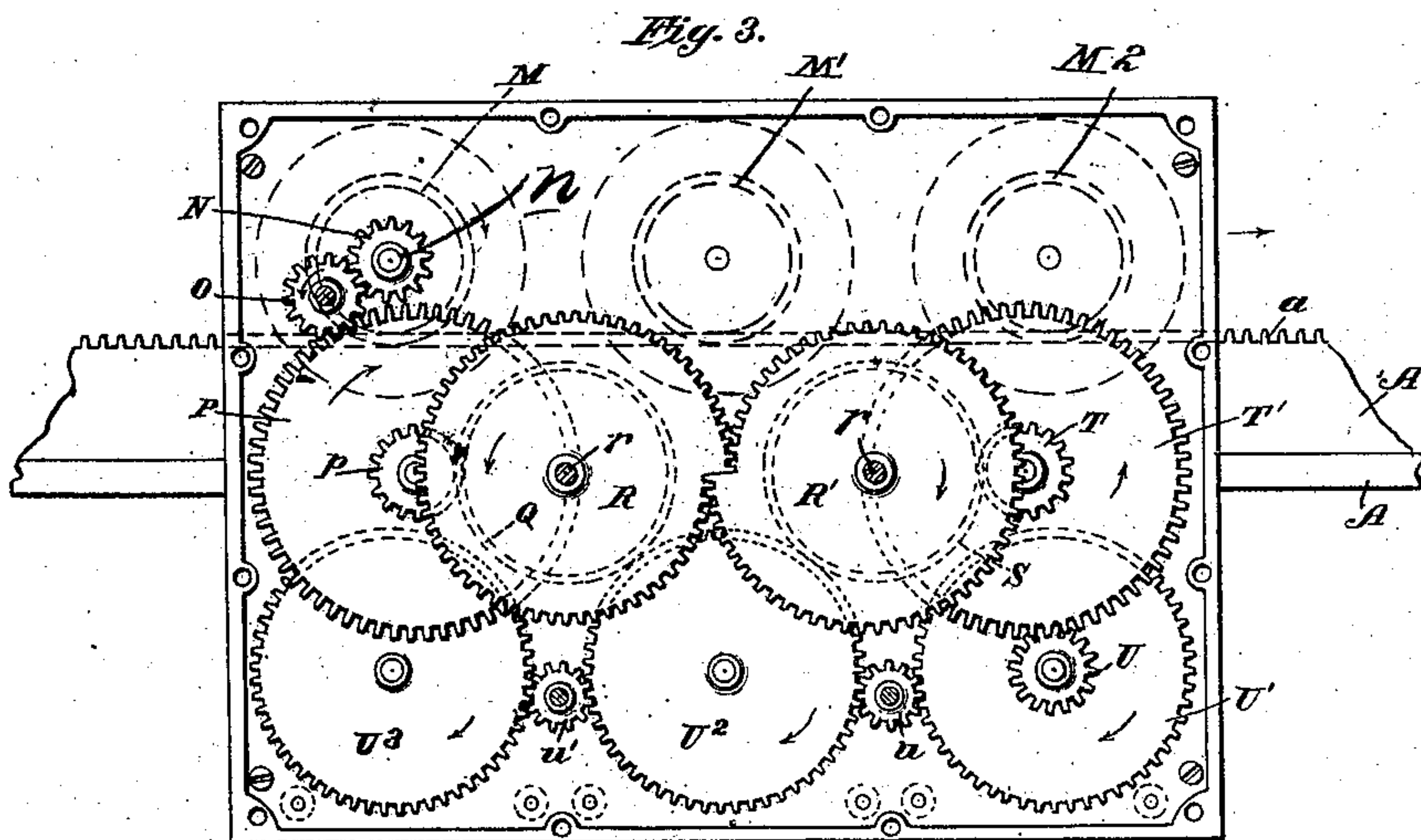
Patented Feb. 18, 1902.

M. F. KNOX.  
COMPUTING POISE FOR SCALES.

(Application filed Apr. 9, 1901.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:  
*Calvin T. Thibaut*  
*Chas. W. Parker*

INVENTOR  
*Matthias F. Knox,*  
BY *A. S. Bacon*  
Attorney



# UNITED STATES PATENT OFFICE.

MATTHIAS F. KNOX, OF NASHVILLE, TENNESSEE.

## COMPUTING-POISE FOR SCALES.

SPECIFICATION forming part of Letters Patent No. 693,523, dated February 18, 1902.

Application filed April 9, 1901. Serial No. 54,975. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHIAS F. KNOX, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Computing-Poises for Scales; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in computing-poises for scales of that nature wherein a poise adapted to slide on the scale-beam to indicate the weight in the usual manner is provided with instrumentalities for indicating to the user the price to be paid for any weight of material indicated by the poise at different prices per pound.

One object of the invention is to provide such a poise with indicating means, whereby the capacity of the same is largely increased without necessarily adding to the size or weight of the poise or the cost of production.

A further object of the invention is to provide the poise with separate computation-indicating bands or devices, so that a large number of computations may be had without materially increasing the dimensions of the poise or weight or decreasing the size of the indicating characters, thus greatly increasing the capacity of the computing-poise without unnecessarily increasing its bulk.

A further object of the invention is to provide the computation-indicating bands with indications to show what weight of merchandise or material at a given price per pound is to be had for a certain amount of money.

A further object of the invention is to provide a computing-poise of the character described with computation-indicating bands or ribbons and operating mechanism therefor.

A further object is to provide a poise of the character described with a computation-indicating band or ribbon, a spool or reeling device for said ribbon, and means for relatively varying the peripheral speed of the reeling device, so as to always insure the correct proportional movement between the band and the movement of the poise along the beam.

A further object of the invention is to provide a generally improved, simplified, and efficient poise for the purpose described.

With such and other objects in view the invention is embodied in the novel parts, arrangement, and combinations of parts hereinafter described, and particularly set forth in the claims.

In the accompanying drawings I have illustrated one form of a poise embodying my invention, but desire it particularly understood that I do not limit my invention in its useful applications to the particular construction which for the sake of an understanding of the invention is therein delineated.

In the accompanying drawings, Figure 1 is a front elevation of a poise embodying my invention and showing a portion of the scale-beam. Fig. 2 is a rear elevation of the poise partially broken away to show the interior gear mechanism. Fig. 3 is a plan view with the top removed to show the regulating-gear for the band-reeling mechanism. Fig. 4 is a horizontal sectional view through the bands and reels or spools.

I have not illustrated in the accompanying drawings a scale and its beam in whole, as it is believed the same is not necessary to a sufficient and clear understanding of the invention. It will be understood, however, that the computing-poise weighing-beam can be associated with and form part of an ordinary double scale-beam, whereby one beam-arm may be employed in connection with the ordinary weight-indicating poise, so that when it is not desired to use the computing-poise the same can be moved to the zero-point on its beam and the weight-indicating poise used in its stead in a well-known manner.

Referring to the drawings, A indicates a scale-beam or scale-beam arm on which the computing-poise (indicated at B) is slidably mounted, the poise being provided with an index *b*, adapted to follow the indications on the beam-arm for the purpose of indicating the weights in a well-known manner. The scale-beam arm A is provided on its rear side with a laterally-projecting flange A', provided with a toothed rack at its outer edge, which is indicated at *a*. The purpose of this toothed rack is to drive the reeling mechanism for the computation-indicating band hereinafter described.

The poise B, as will be seen, is in the form of a hollow casing or boxing, which is conveniently made up of side pieces with front and



back pieces secured thereto in any preferred or usual manner. As will be seen from the drawings, I have shown the front plate C secured to the poise and extending from a point 5 slightly below the lower edge of the beam-arm to the top of the poise. This front plate is provided with view-openings D, three of which are indicated in the drawings, and beside which openings are indicating or index 10 bars E. These bars are shown to be formed with or a part of the front plate of the casing; but it is evident that they need not necessarily be made in this manner, as they may be made of separate pieces secured to the front 15 plate or otherwise formed. Each of the indicating-bars E is provided, as will be seen, with a series of pointers or index-fingers  $e$  and adjacent these indicating-fingers with a number indicating the price per pound, and each indicating-bar is also provided with a series of 20 index pointers or fingers  $e^2$ , arranged alternately between the index-pointers or index-fingers  $e$ . It may be stated here that the index pointers or fingers  $e$  are for the purpose 25 of pointing or indicating the price to be paid for a certain weight of merchandise at the price per pound indicated by the number adjacent said pointer, while the indicating pointers or fingers  $e^2$  cooperate with indications on 30 the computation-bands for indicating how much merchandise at the price per pound indicated by the number adjacent said pointer or finger may be purchased for a predetermined amount of money, the amounts indicated on the drawings being multiples of five 35 cents. In rear of the front plate C and covering the slots therein is a plate or plates of glass (indicated at F) for the purpose of enclosing the computation-indicating bands and 40 protecting the same from dust. The glass may be held in place in any preferred or suitable manner, and it is not thought necessary to mention herein any specific means.

The indicating bands or ribbons are shown 45 at G, G', and G<sup>2</sup>, three being shown in the present instance, but it being understood that one, two, or any number desired may be employed, according to the desired capacity of the poise. These bands or ribbons are mounted upon and operated by suitable front and 50 rear rolls or spools, the front spool being indicated for the respective bands at H, H', and H<sup>2</sup> and the rear spools being respectively indicated at I, I', and I<sup>2</sup>, the bands, as will 55 be seen from the drawings, being connected to one spool and passing to and rolled upon the other spool. As will be seen, especially, from Fig. 4 of the drawings, the bands do not pass directly from the rear spools to the front 60 spools, but pass from the rear spools to guide-rollers J, which are journaled near the front plate of the poise. It will thus be seen that by passing the bands or ribbons over the guide-rollers J, as indicated at Fig. 4, the 65 bands are held flat against or very close to the front glass plate and move parallel therewith, the purpose being to hold the bands or

ribbons near to the viewing slots or openings D, so that the indications thereon will move 70 in correct alinement and very close to the index-pointers on the bars E. The spools H, H', and H<sup>2</sup> and I, I', and I<sup>2</sup> are provided with journals, (indicated at  $h$  and  $i$ ,) the journals passing through and finding bearing in open- 75 ings in the plate K at the bottom, just above the scale-beam A, and at the upper ends of the spools is similarly arranged a plate L, a short distance from the top of the poise, into the openings in which plate the upper journals of the spools extend and have bearing. 80 Each of the rear spools is provided at its lower end with a gear M, (respectively indicated at M, M', and M<sup>2</sup>.) These gears are secured to the lower journals below the lower plate K and are adjustable on the journals by means 85 of set-screws, (indicated at  $m$ ,) which pass through the hubs of the gears into engagement with the journals in a well-known manner. Each of the gears M, M', and M<sup>2</sup> engages with and is rotated by the toothed rack 90  $a$  on the scale-beam when the poise is slid thereon.

For the purpose of correctly speeding the bands or ribbons so that at the view-open- 95 ings they will move always at the same relative speed or the same relative distance, according to the movement of the poise on the beam, I make use of the following instrumentalities: Located within the space between the upper plate L and the top of the 100 poise is a train of gearing, of which N indicates a pinion which is secured to and rotated by the spool I, which, as has before been said, is rotated by the gear at its lower end. This pinion N is conveniently provided with 105 a hub or stud  $n$ , extending into a suitable recess in the top of the casing or poise B, and is also provided with a squared end  $n'$ , entering a correspondingly-shaped hole in the upper end of the roll or spool I. This construc- 110 tion affords a detachable connection between the pinion and the spool I. The pinion N, as will be seen, referring especially to Fig. 3, meshes with and rotates a pinion O, which is loosely journaled in a bearing in the upper 115 plate and in turn meshes with and drives the gear P, which is provided with a journal journaled in the upper plate L and which is secured to a pinion  $p$ , meshing with a pinion Q, fixed or rigidly secured to a scroll- 120 gear R. This scroll-gear meshes with and drives a similar oppositely-arranged scroll-gear R', which latter, like the other scroll-gear R, is secured to a pinion S. The scroll-gears R and R' are suspended from the top 125 plate by pivotal studs  $r$ , Fig. 2. The pinion S meshes with and drives the pinion T, which is secured to a gear-wheel T', the latter meshing with and driving a pinion U, fixed to the upper journal of the front spool 130 H<sup>2</sup>. The spool H has also secured thereto the gear U', which meshes with and drives an idler-pinion  $u$ , which in turn meshes with and drives a gear U<sup>2</sup>, secured to the front



spool H', the latter gear  $U^2$  meshing with and driving an idler-pinion  $u'$ , which meshes with and drives a gear  $U^3$ , connected to the journal of the front spool H. From the gearing just described it will be observed that the three front rollers—that is, the front roller for each of the bands—are driven by or from the rear spool I and that the speed or motion of the front spools is a variable one governed and controlled by the scroll-gears R and R' and the train of gearing operated thereby. The purpose of this gearing and its operation are believed to be manifest, it being used to decrease the peripheral movements of the front spools as the latter take on the bands or ribbons and increase in size, during which it is evident that the ribbons or bands, unless the spools are variably speeded, will not be moved always the same distance relative to the amount of movement of the poise on the scale-beam. The manner of mounting or journaling the gears is not an essential feature of this invention.

Each of the computation-indicating bands, as will be seen, is provided with two series of numbers, the first (shown at  $g$ ) indicating the price of the number of pounds indicated by the poise at the price per pound indicated by the number on the bar E adjacent said number. The second series of numbers (indicated at  $g'$ ) is for the purpose of assisting in ascertaining the number of pounds of merchandise which can be purchased for a given or stated sum, and these numbers in the series  $g'$  cooperate with the index-pointer  $e$ , indicating, when a register-mark (indicated at  $g^3$ ) on the computation-indicating band registers with the index-pointer  $e$ , that the number of pounds of merchandise indicated by the poise-index  $b$  at the price per pound indicated by the number on the bar E can be had for the amount or sum of money indicated by the number on the indicating-band whose register-mark registers with the index-pointer  $e$ . Each band or ribbon at its upper end is provided with a series of figures agreeing with the figures on the scale-beam and so arranged relative thereto that when the index  $b$  of the poise indicates a certain weight on the weight-beam the number indicating the same weight should appear in the view-openings at the top. This series of numbers or indications is shown at  $g^4$ , and it will be understood by the user that if the numbers at  $g^4$  and at the index  $b$  do not agree the bands are out of proper adjustment and their adjustment must be corrected. This is done by adjusting the gear-wheel M on the lower ends of the spools by means of the set-screws  $m$ , before referred to.

It will be observed that the reeling-spools for the bands are located on each side of the scale-beam and that the bands move transversely across the beam from one spool to the other, thereby preventing an accumulation or diminution of weight at one point of the

poise longitudinally relative to the beam, and thus avoiding a shifting of the weight of the poise to different points longitudinally of the scale-beam, which would interfere with the correct operation of the poise.

From the above it is believed that the operation and use of the invention will be thoroughly understood; but for the purpose of clearness it might be well to make the following statement of its use in connection with a specific case. Suppose it is desired to deliver to a customer eight pounds of merchandise at five cents per pound. The operator moves the poise on the beam until the index  $b$  registers with the eight-pound mark on the beam, when by looking at the indication opposite the index-pointer  $e$  for the five-cent-per-pound indication he will see that the price is forty cents. Now suppose the purchaser desires to buy forty cents' worth of merchandise which sells for five cents per pound. The salesman instead of making the calculation as to the number of pounds watches the five-cents-per-pound indication on the bar E and moves the poise until the register-mark  $g^3$  adjacent the figure "40" registers with the index-pointer  $e$ , at which time the poise will indicate to him the number of pounds to deliver for such price, which in the instance indicated will be eight pounds, as indicated by the index  $b$  of the poise.

The drawings, it will be observed, show the computation-indicating bands provided with two columns or rows, lengthwise, of figures for each price; but it is to be understood that I reserve the right to the use of but one column.

By making the bands sufficiently long and properly proportioning the size of the spool or driving-gears M the band can be made to move, say, an inch or more for each movement of the poise on the beam from one pound indication to the next, thus providing ample space for all figures and marks in one column, and consequently reducing more or less the size of the poise. Thus, also, will be provided means for indicating prices for small fractions of pounds, the fractions of pounds being indicated at the top of the band and seen through the weight-openings.

It will be apparent that, if preferred, the driving-gears M can be placed on the lower ends of the journal of the front rolls instead of the rear ones and the register-marks on the bands regulated to register accurately. Of course the scroll-gears are employed in either instance.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a slidable poise, of a computing-band, spools in operative communication with the band disposed at separated points within the poise, and on opposite sides of the beam adapted to be moved with the poise, and means for imparting a rotary motion to the spools to effect the travel



of the band from one to the other thereof when the poise is slid back and forth, substantially as described.

2. The combination with a scale-beam provided with a toothed rack, of a computing-poise slidably mounted on said beam, a spool journaled in said poise at one side of said beam, a spool journaled in said poise at the other side of said beam and opposite said first-named spool, a computation-indicating band secured to and adapted to be wound upon said spools and a gear connected to one of said spools and geared to said toothed rack on the scale-beam, substantially as described.

3. The combination with a scale-beam provided with a toothed rack, of a poise slidable thereon, a plurality of computation-indicating bands in said poise, spools for each band to which the same is secured and upon which it is adapted to be wound, a gear connected to one of said spools and geared to said toothed rack, and a train of gearing connecting said spools for driving all of said bands, substantially as described.

4. The combination with a scale-beam provided with a toothed rack, of a poise slidable thereon, and having separated bearing-plates therein, a spool journaled in said bearing-plates at one side of said beam, a spool journaled in said bearing-plates at the opposite side of said beam and opposite said first-named spool, a computation-indicating band connected to said spools, a gear secured to the journal of one of said spools below the lower bearing-plate, and a train of gears connecting said spools located between the upper bearing-plate and the top of the poise for operatively connecting the spools, substantially as described.

5. In a computing-poise, the combination with a ribbon or band provided with a series of computations arranged in pairs, means for carrying and operating the band within the poise, and a corresponding series of index-pointers arranged in pairs of differentiating configurations carried by the poise, substantially as described.

6. In a computing-poise, the combination with a computation-indicating band, of spools on which said band is wound, means for driving one of said spools, and gearing instrumentalities intermediate the spools for variably driving the other spool, substantially as and for the purpose set forth.

7. In a computing-poise, the combination with a beam on which the poise slides, a computation-indicating band, vertically-disposed spools on opposite sides of the beam within the poise on which said band is adapted to be wound, and an operative communication between the end of one of the spools and the scale-beam for revolving the spools when the

poise is slid back and forth, substantially as described.

8. In a computing-poise the combination with a plurality of computation-indicating bands, of a reeling mechanism for each band comprising a plurality of spools, means for driving one of said spools, and driving mechanism for connecting said driven spool to the other of said spools for variably driving said other spools, substantially as described.

9. In a computing-poise, the combination with a computation-indicating band, of spools on which the same is wound, means for driving one of said spools, and means for driving the other of said spools variably, including scroll-gears, substantially as described.

10. In a computing-poise, the combination with a plurality of computation-indicating bands, of spools upon which the bands are adapted to be wound, means of driving one of said spools to cause the travel of the bands, and a variable driving mechanism for the other spools, said drive mechanism being operated by said driven spool, substantially as described.

11. The combination with a scale-beam provided with a toothed rack, of a computing-poise slidable thereon, a plurality of computation-indicating bands, a series of spools on one side of said scale-beam, a series of spools on the other side of said scale-beam, operative communication between the spools and bands, means for driving one of said spools on one side by the toothed rack, a variable drive mechanism for the spools on the other side of said scale-beam operated by said driving-spool, substantially as described.

12. In combination with a fixed part, a part movable bodily on said fixed part, and computation-indicating instrumentalities within the movable part adapted to be operated and conveyed thereby, comprising an indicating-band, spools onto which the band is wound, and means for rotating the spools at different speeds, substantially as and for the purpose described.

13. In combination with a fixed part, a part movable bodily on said fixed part, and computation-indicating instrumentalities within the movable part adapted to be conveyed thereby, comprising an indicating-band, spools onto which the band is wound, means in communication with the fixed part for driving one of the spools and means for variably driving the other of said spools, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MATTHIAS F. KNOX.

Witnesses:

T. O. TICE,

JNO. H. HUEY.