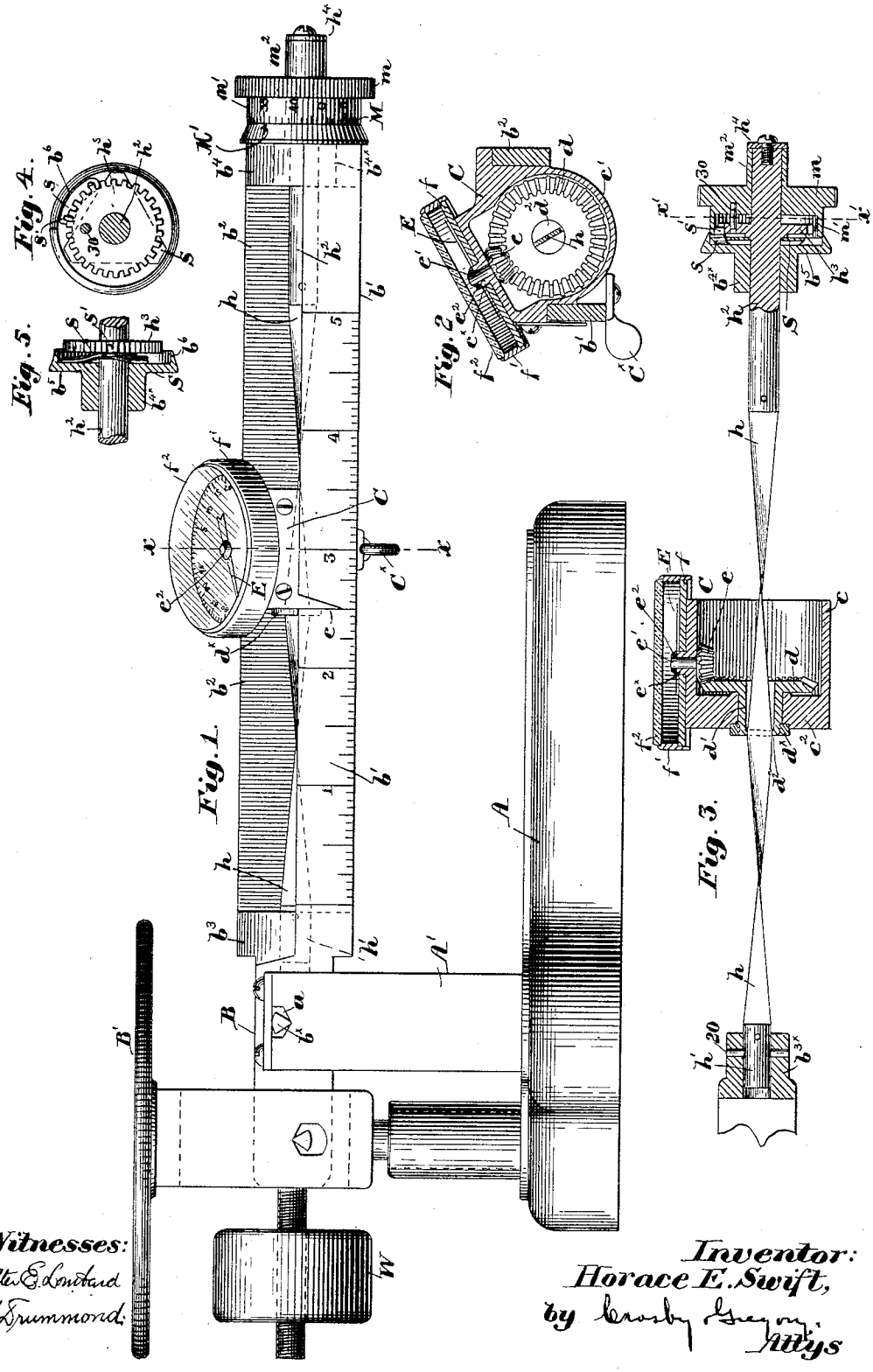
(No Model.)

H. E. SWIFT.

COMPUTING SCALE.

No. 579,550. Patented Mar. 23, 1897.



Witnesses:
Walter E. Lombard
W. J. Drummond.

Inventor:
Horace E. Swift,
by Crosby Gregory
Attys

UNITED STATES PATENT OFFICE.

HORACE E. SWIFT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE NATIONAL COMPUTING SCALE COMPANY, OF PORTLAND, MAINE.

COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 579,550, dated March 23, 1897.

Application filed January 25, 1896. Serial No. 576,847. (No model.)

To all whom it may concern:

Be it known that I, HORACE E. SWIFT, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Computing-Scales, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention has for its object the production of a novel and accurate computing-scale wherein the aggregate price of the article weighed may be computed automatically according to the unit price of said article.

The construction of the scale is at once simple, strong, and readily operable, while quickly responsive to the slightest change of weight or price per unit and accurate throughout the entire range of the scale.

In this invention the operation of the computing mechanism is determined by the change of form of a controlling member, such change varying in accordance with the unit price, the controlling member being herein shown as a preferably resilient metallic strip adapted to be twisted into spiral form, the pitch of the spiral or helix varying in accordance with the unit price. This controlling member herein is in such coöperative engagement with the computing mechanism that the operation of the latter is determined by the pitch of the imparted spiral.

I have herein for convenience shown my invention as embodied in a beam-scale; but my invention is not restricted thereto, nor to any particular construction and arrangement of apparatus, for so far as I am aware it is broadly new to govern the operation of the computing mechanism in a scale of the class described by a change or variation in the form of a controlling member, such change or variation of form corresponding to the unit price of the article.

Figure 1, in side elevation, represents one well-known form of beam-scale with my invention embodied therein. Fig. 2 is a transverse sectional view showing the price-computing mechanism, taken on the line $x\ x$, Fig. 1. Fig. 3 is a detail view in elevation and section of the price-computing mechanism, controlling member, and means for changing the form of the latter in accordance with the unit price. Fig. 4 is a transverse sectional view on the line $x'\ x'$, Fig. 3, of the locking mechanism for the controlling member; and Fig. 5 is a longitudinal sectional detail of the locking mechanism with the releasing device omitted.

Referring to Fig. 1, the scale-base A, having the beam-supporting standard A′ provided with suitable bearings a for the knife-edge journals $b^{\times}$ of the beam B, the support B′ for the article to be weighed, mounted on the beam, and the counterbalance W may be and are all as common in so-called "beam" or "counter" scales. I have herein shown the free arm of the beam B as composed of two separated rigid bars b' and b^2 in different vertical and horizontal planes, secured at their ends to holders $b^3\ b^4$, said bars constituting tracks or guides for a poise C, longitudinally movable thereon. The bar b', as herein shown, has its outer face graduated in the direction of its length to indicate pounds and fractions thereof, a pointer or finger c on the poise C coöperating with said graduations to indicate the weight of the article by the position of the poise.

As shown best in Figs. 2 and 3, the poise C has a cylindrical portion c' between the bars $b'\ b^2$, and mounted rotatably in the end c^2 thereof is the hollow hub d' of a bevel-gear d, said gear being retained in place in its bearing by a suitable annulus $d^{\times}$, Fig. 3. The outer end d^2 of the hub d' is shown as slotted diametrically, Figs. 2 and 3, for a purpose to be described, the gear d within the part c of the poise having its teeth in engagement with a bevel-pinion e, fast on the inner end of a spindle e', extended through a boss $c^{\times}$ of the part c, a collar e^2 on the outer end of the stud retaining it in place.

For greater convenience of observation, as will be apparent, the top of the poise is inclined, as best shown in Fig. 2, to receive thereon a dial-plate f, preferably inclosed by a casing f' and a cover f^2, of glass or other transparent material.

The spindle e' projects through the center of the dial and has fast thereto a hand or pointer E, movable around a series of graduations on the dial, (partially shown in Fig. 1,)

indicating dollars and fractions thereof or any other desired unit of value.

Obviously rotation of the pointer E by means of the pinion *e* and gear *d* will indicate upon the dial *f* an amount of money corresponding to the extent of such rotation, the said gear-pinion, dial, and pointer constituting price-computing mechanism.

I have herein shown the controlling member of the scale as a thin preferably resilient strip or ribbon *h*, of metal, preferably tempered steel, attached at one end to a plug *h'*, rigidly secured from longitudinal or rotative movement in a boss $b^{3\times}$ of the holder b^3 (see Fig. 3) by a pin 20 or in other desirable manner, the other end of the controlling member *h* being mounted in a rotatable manner, to be described, said member passing through the diametrical slot in the gear-hub *d'*. The other end of the controlling member *h* is secured to a spindle h^2, rotatable in a bearing $b^{4\times}$ in the holder b^4 and provided with a toothed or notched locking-disk h^3. Said bearing has a laterally-extended head b^5, provided with an annular outwardly-turned flange or lip b^6, Figs. 1 and 3, to receive therein the circular wall or bevel *m'* of a preferably milled nut *m*, loose on the spindle h^2, the hub *m'* of the nut being retained in place by a suitable cap h^4, secured to the outer end of the spindle. The nut *m* and disk h^3 are connected to rotate in unison by a pin or stud 30 on one entering a hole in the other, permitting movement of the nut toward and from the disk. A detent, herein shown as a spring *s* secured to the bearing $b^{4\times}$, has an upturned lug *s'*, adapted to enter one or other of the notches of the disk h^3 to prevent its rotation, and consequently the rotation of the spindle h^2, said spring being in the path of the wall *m'* of the nut, so that when the latter is moved inward the detent will be withdrawn from engagement and release the disk h^3, rotation of the nut thereafter in either direction rotating the spindle h^2.

In order to keep the controlling member *h* under tension, I interpose a spring-washer S between the bearing $b^{4\times}$ and the disk h^3, as herein shown, said spring being shown best in Fig. 4 as triangular in shape.

The barrel *m'* of the nut *m* is graduated externally, as at M, Fig. 1, and herein shown as having fifty equal divisions, to denote the unit price of the article, an index M' on the exterior of the flange b^6 coöperating therewith, the nut acting as a unit-price-selecting device.

Now when the price-selecting device is set at zero the controlling member *h* will be maintained as a flat strip or band, and the poise C may be moved along the beam B to any point without any operation of the computing mechanism, and articles can be weighed in the usual manner as with an ordinary beam-scale. If, however, the price-selecting nut *m* be moved ever so little from zero position, the form of the controlling member *h* will be proportionally changed, the said member being twisted, as herein shown, into a helix or spiral whose pitch is uniform throughout its length, the pitch depending upon the amount of rotation of the price-selecting device. Such change in form of the controlling member being effected, any movement of the poise C along the beam will, through the rotation imparted to the actuating-gear *d* by the spiral trend of the controlling member, operate the computing mechanism proportionally to the variation of form of the controlling member from the normal, such proportional movement being determined by the pitch of the helix. Accordingly when the aggregate price of an article is desired corresponding to a given unit price the price-selecting nut *m* is pressed in by the operator, either before or after the poise has been positioned, to release the disk h^3, and then turned until the proper unit price denoted on the graduation M is opposite the index M', and thereafter the said nut is released to lock the disk h^3 and thereby the controlling member *h*, as described. The weight of the article, which is placed upon the platform B', is then determined by the positioning of the poise, and the computing mechanism will, by its hand E and graduated dial *f*, indicate the aggregate or computed price of such article according to the unit price selected. The resiliency of the controlling member *h* tends to return it to normal position when released and also insures absolute uniformity of pitch throughout its length when its normal form has been changed.

As will be evident, the parts of the computing mechanism are so few in number that but little friction has to be overcome, and the operation of the said mechanism is very positive and exact, whether the weight of the article or the unit price thereof be small or large.

The poise C is preferably provided with a finger-piece $C^{\times}$ to facilitate its positioning by the operator.

By adjusting the counterbalance of the beam it will be obvious that the computing mechanism as a whole may comprise the poise, or the poise proper may support a price-computing mechanism, as herein shown.

While I have herein shown my invention embodied in a beam-scale, it will be obvious that my invention is not restricted thereto, for other forms of computing-scale may be made embodying and operating in accordance with the principle herein set forth.

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

1. In a computing-scale, weighing mechanism, price-computing mechanism; and a separate controlling member to determine by its form the operation of the computing mechanism, substantially as described.

2. In a computing-scale, weighing mechanism, price-computing mechanism; a controlling member to determine by its form the op-

eration of the computing mechanism, and a unit-price-selecting device to govern the form of the controlling member, substantially as described.

3. In a computing-scale, weighing mechanism; price-computing mechanism; a resilient controlling member adapted to determine by its change of form the operation of the price-computing mechanism, and means to retain said controlling member in a predetermined form, substantially as described.

4. In a computing-scale, weighing mechanism; price-computing mechanism; and a flexible controlling member to determine the operation of said computing mechanism by flexure of the controlling member in accordance with the unit price, substantially as described.

5. In a computing-scale, weighing mechanism; price-computing mechanism actuated by operation of the weighing mechanism, a resilient metallic controlling member adapted to be varied in form to determine the operation of the computing mechanism, and a manually-operated price-selecting device to vary the form of said controlling member, substantially as described.

6. In a computing-scale, weighing mechanism including a member positioned according to the weight of the article; price-computing mechanism actuated by movement of said member, and a controlling member to determine by its change of form the operation of the price-computing mechanism, substantially as described.

7. In a computing-scale, weighing mechanism including a member positioned according to the weight of the article; price-computing mechanism carried thereby; a controlling member in continuous engagement with the computing mechanism, to determine by its form the operation of said mechanism, and means to change the form of said controlling member in accordance with the unit price, substantially as described.

8. In a computing-scale, weighing mechanism, including a member positioned according to the weight of the article; price-computing mechanism carried thereby; a resilient controlling member in engagement with said computing mechanism, and means to impart spiral twist to said controlling member varied in pitch in accordance with the unit price, to determine the operation of the computing mechanism, substantially as described.

9. In a computing-scale, weighing mechanism; price-computing mechanism, including a rotatable member; a resilient controlling member in engagement therewith, and means to impart spiral twist to said controlling member in accordance with the unit price, relative movement of said rotatable controlling members in the direction of the length of the latter determining the operation of the computing mechanism, substantially as described.

10. In a computing-scale, weighing mechanism, including a beam and a poise movable thereon; price-computing mechanism carried by said poise; a controlling member supported by the beam, and means to change the form of said member in accordance with the unit price, to determine the operation of the computing mechanism, substantially as described.

11. In a computing beam-scale, a beam; a poise movable thereon; a resilient metallic controlling member supported by said beam and rigidly held at one end thereof; means to twist said controlling member in accordance with the unit price of the article weighed, and price-computing mechanism bodily movable in unison with the poise and in continuous engagement with and having its operation determined by the change in form of the controlling member, substantially as described.

12. In a computing beam-scale, a beam; price-computing mechanism bodily movable thereon; a thin metallic strip supported by the beam and rigidly held at one end constituting a controlling member; manually-operated means to twist said strip in the direction of its length, and to retain it in twisted form, and a device to maintain the controlling member under tension, the pitch of the spiral of said member determining the operation of the computing mechanism when moved bodily on the beam, substantially as described.

13. In a computing-scale, weighing mechanism; computing mechanism bodily movable according to the weight of the article; a resilient, flexible controlling member in engagement with and adjacent the path of bodily movement of said computing mechanism, and means to twist said controlling member to thereby determine the operation of the computing mechanism, the pitch of the spiral varying according to the unit price, substantially as described.

14. In a computing-scale, a beam; price-computing mechanism thereon, a resilient, flexible controlling member also supported by the beam and in engagement with said mechanism, to determine by its form the operation of the latter, and means to change the form of said member in accordance with the unit price of the article, said computing mechanism and controlling member being relatively movable in the direction of the length of the latter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE E. SWIFT.

Witnesses:
JOHN C. EDWARDS,
FREDERICK L. EMERY.