No. 627,152.

Patented June 20, 1899.

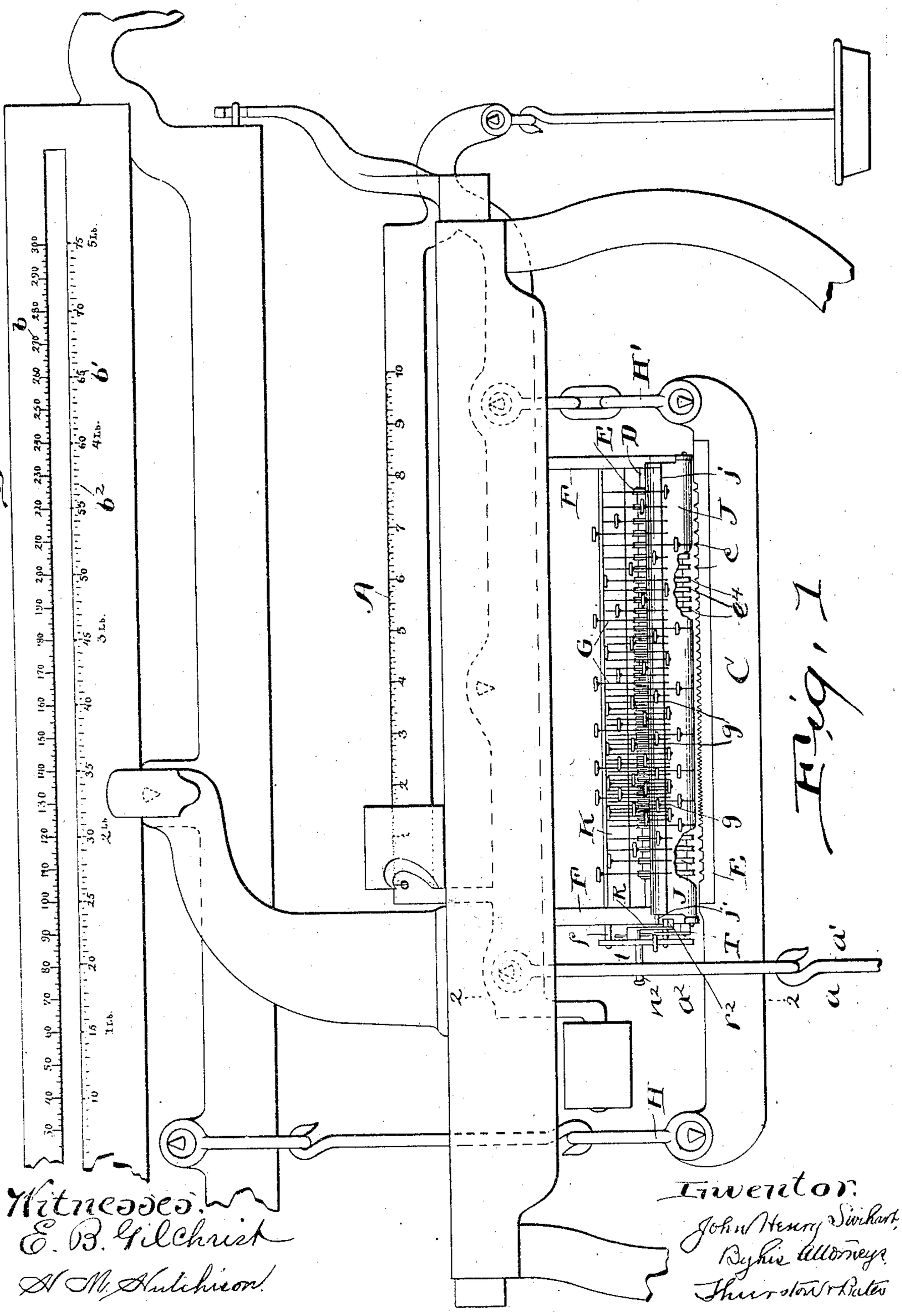
J. H. SWIHART.

COMPUTING SCALE.

(Application filed May 24, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
E. B. Gilchrist
A. M. Hutchison.

Inventor:
John Henry Swihart
By his Attorneys
Thurston & Bates

No. 627,152. Patented June 20, 1899.

J. H. SWIHART.

COMPUTING SCALE.

(Application filed May 24, 1897.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

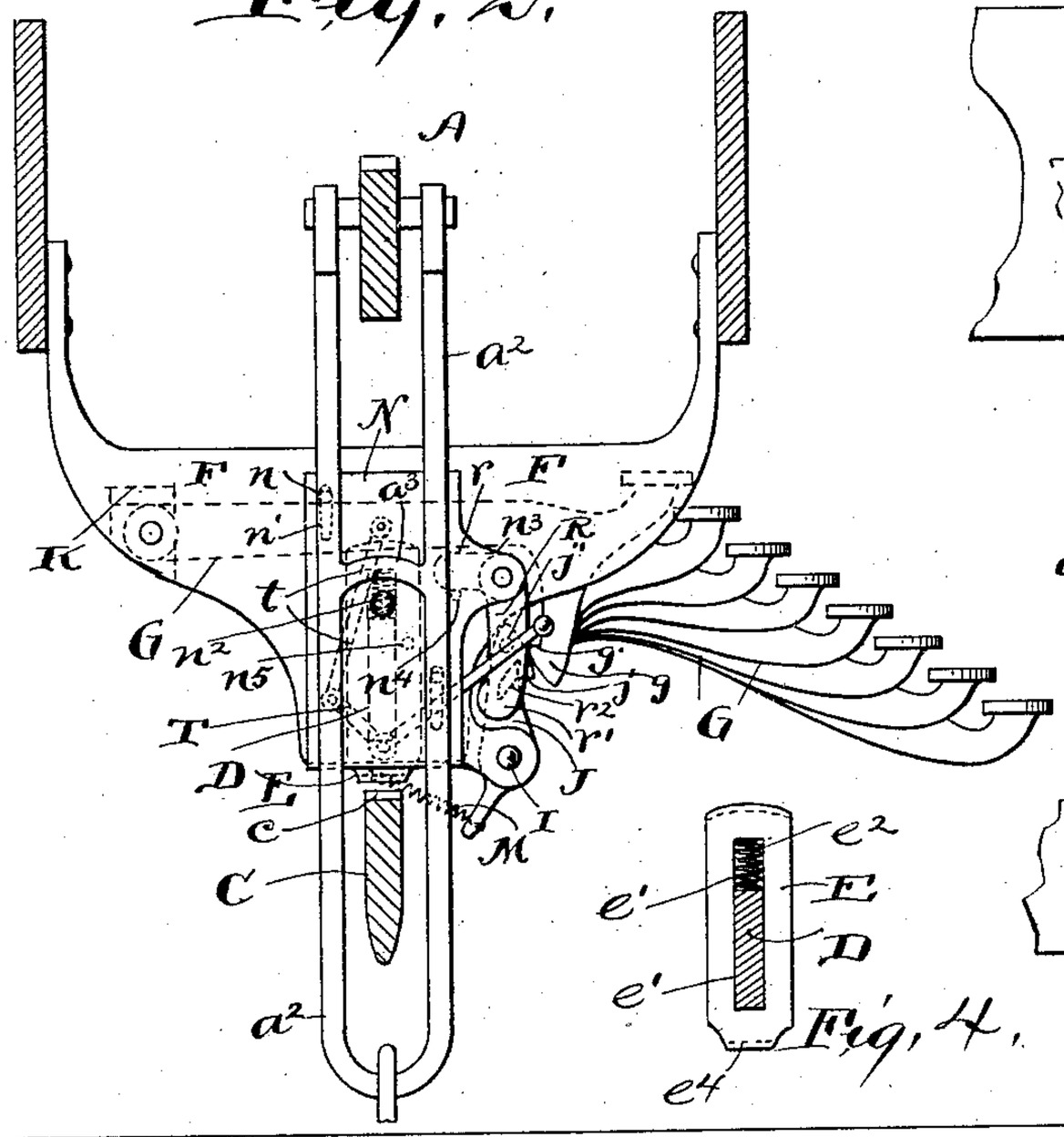


Fig. 3.

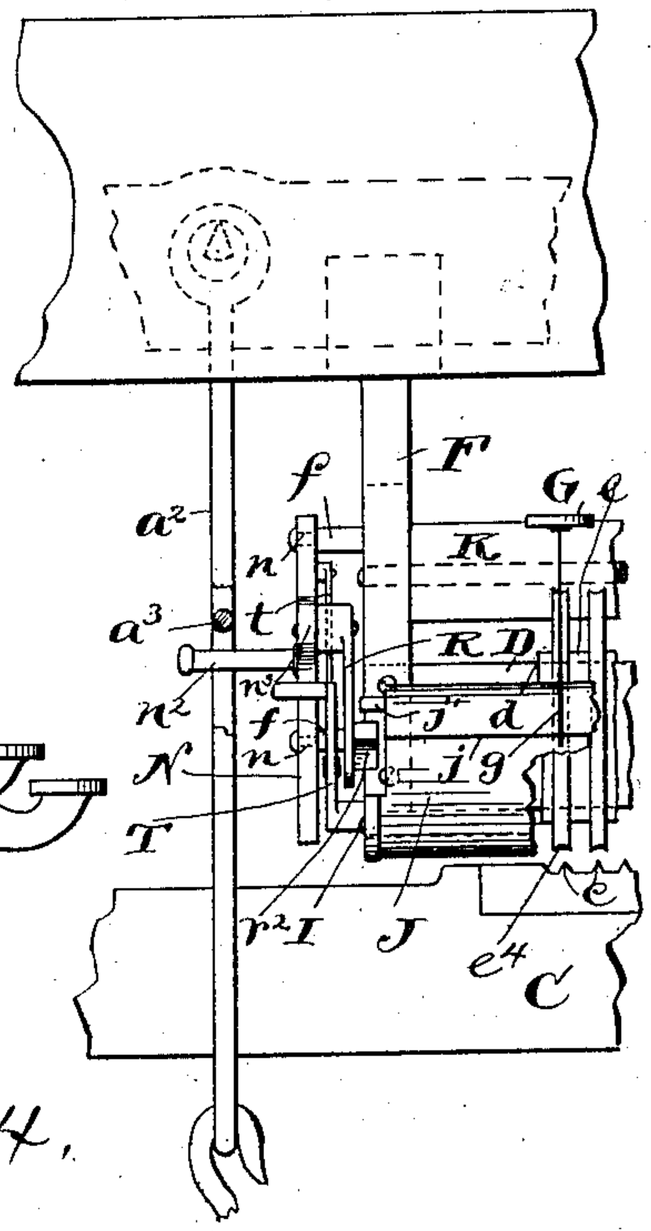
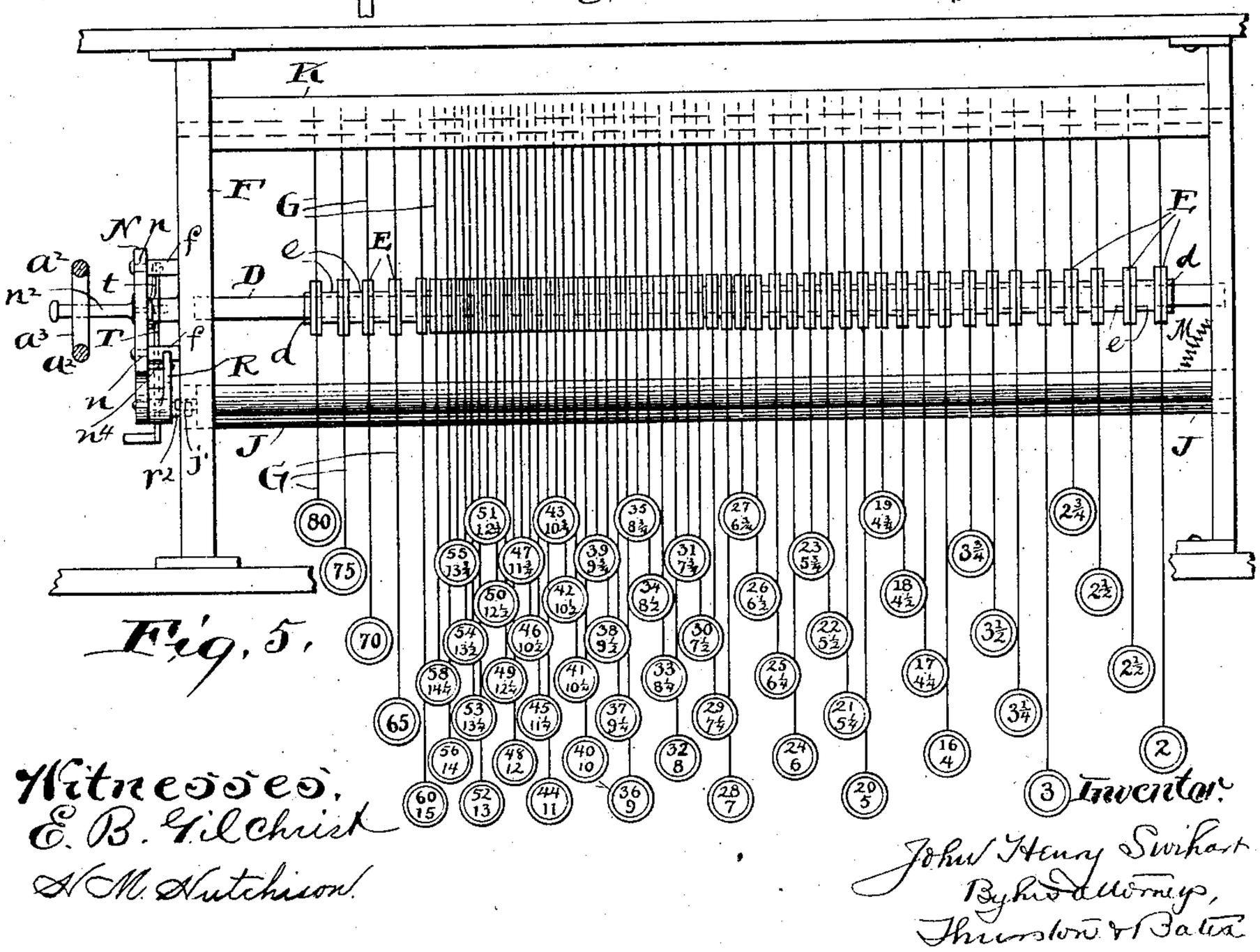


Fig. 4.

Fig. 5.



Witnesses:
E. B. Gilchrist
H. M. Hutchison.

Inventor:
John Henry Swihart
By his Attorneys,
Thurston & Baker

UNITED STATES PATENT OFFICE.

JOHN HENRY SWIHART, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL COMPUTING SCALE COMPANY, OF SAME PLACE.

COMPUTING-SCALE.

SPECIFICATION forming part of Letters Patent No. 627,152, dated June 20, 1899.

Application filed May 24, 1897. Serial No. 637,900. (No model.)

To all whom it may concern:

Be it known that I, JOHN HENRY SWIHART, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Computing-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.

My invention relates to certain improvements in computing-scales, and particularly to the means whereby such scales may be "set" or adapted to indicate values at different rates.

The objects of the invention are to provide convenient and easily-operated means for setting the scale, to diminish the possibility of error in so doing, and to diminish the wear upon the scale.

The invention consists, broadly, in the combination with a rate-beam and a plurality of vertically-movable fulcrum-blocks adapted to be moved each into engagement with a predetermined part of said rate-beam.

It also consists in the more specific combinations of parts, as pointed out in the claims.

In the drawings, Figure 1 is a front elevation of the upper part of a computing-scale employing my invention. Fig. 2 is a sectional left end view on line 2 2 of Fig. 1. Fig. 3 is an enlarged front view of the mechanism embodying my invention. Fig. 4 is a sectional view of the fulcrum-supporting bar, showing one of the fulcrum-blocks; and Fig. 5 is a plan view of the part of the scale containing my invention.

The particular form of scale which I have chosen to illustrate my invention is substantially that which is described in Letters Patent No. 578,784, granted to me March 16, 1897; but the invention is applicable to many forms of computing-scales wherein the leverage of the rate-beam is varied by changing the fulcrum-point thereof.

Referring to the parts by letters, A represents one of the scale-beams, and *a* the connecting-rod wherewith it is connected with the platform-levers, (which are not shown.) This connecting-rod may be made of a lower section *a'* and an upper link a^2, which is a well-known construction of scale connecting-rods.

B represents the value-beam. C represents a horizontal rate-beam which is suspended at its ends by the links II II' from the beams A and B, respectively. The value-beam may be provided with a plurality of sets of value-indicating figures *b b'*, associated with the same or similarly-placed marks b^2, whereby this beam will indicate values at either of two rates corresponding with each fulcrum-point on the rate-beam. So much of the scale as is above described is substantially like that which is shown in the prior patent mentioned.

D represents a horizontal rectangular bar which is secured to the brackets F, and thereby held above and parallel with the rate-beam. The brackets are secured to some fixed part of the frame of the scale.

E E represent fulcrum-blocks which are supported upon said bar in such manner that they may move vertically, but not otherwise. Movement along the bar may be prevented by shoulders *d d* at the ends of the series of blocks and by placing said blocks in contact, as shown, near the left end of the bar D or by placing spacing-blocks *e* between them, as shown, near the ends of said bar. The bar D passes through rectangular slots *e'* in the fulcrum-blocks. Each fulcrum-block is raised by a spring e^2, which is compressed between the top of bar D and the top of the slot.

The lower edge of each block E is adapted to engage with a definite part of the rate-beam. The edge of the rate-beam may have a plurality of properly-spaced knife-edges *c*, and the lower edge of each fulcrum-block may have a shallow groove e^4, in which the associated knife-edge engages; or, instead, the edge of the beam may have properly-spaced notches, as shown in said prior patent, and each fulcrum-block may have a knife-edge like that on the single fulcrum-block shown in said prior patent.

Associated with each fulcrum-block is a key-lever G, which is pivoted at its rear end to a horizontal bar K, which bar is secured to the brackets F. Each key-lever passes over and engages with the top of a corresponding fulcrum-block. Upon each key is placed

a figure or figures indicating the rate or rates at which the scale will be set if said key is depressed and the corresponding fulcrum-block brought into engagement with the rate-beam. A latching device is provided for holding the key down until the completion of the particular operation for which the scale is set by the downward movement of the key. It is not essential to the invention, broadly considered, what form of latching mechanism shall be used. The mechanism for this purpose shown in the drawings consists of a rock-shaft I, to which is rigidly secured a latch-lever J, the length of which is equal to the entire distance from the outside key at the right to the outside key at the left. This latch-lever has a hook or shoulder j on its front face, and above this shoulder the lever is beveled backward. Each key-lever is provided with a depending arm g, having a similarly-shaped end—that is to say, an end having a hook or shoulder g' and a beveled portion below the same. When, now, any key-lever is depressed, it pushes this latch-lever backward until the two shoulders pass each other, whereupon the latch-lever is swung forward, so that its shoulder g' engages above the shoulder j on the key-lever, whereby the upward movement of the key-lever is prevented. The latch-lever is moved automatically in the latching direction by means of a spring M.

I believe I am the first to devise a computing-scale wherein is employed a plurality of fulcrum-blocks each of which may be moved into contact with a predetermined part of the rate-beam. I do not, therefore, intend or wish to limit the invention to the specific embodiment shown further than is expressed in the claims.

It is desirable to prevent any movement of the beams even when a load is put upon the scale-platform until after the scale has been set. I have shown in the drawings mechanism for attaining this result.

A vertically-sliding plate N is held against lugs $f\,f$ on the left bracket F by means of screws n, which pass through vertical slots n' in the plate. The plate is permitted to move, but is guided in its movements by these slots and screws. On this plate is a pin n^2, which projects under a cross-bar a^3, which is an integral part of the link a^2. When the plate N is down, this pin does not interfere with the movement of the link; but when the plate is raised this pin engages with the cross-bar a^3 and holds the link a^2 up. This plate is moved up and down by a toggle device consisting of the bent lever T, which is pivoted to the bracket F, and a link t, which is pivoted to the lever T and to the plate N. When the handle end of the lever is moved down, the plate is raised, with the result before stated. By moving the toggle-link just over the center the plate is held up. A pin n^5 on the plate, with which the link t engages, limits this movement over the center. This same mechanism forms part of the means for releasing any depressed key-lever from the influence of the latch J. Pivoted to a forwardly-projecting arm n^3 of the plate N is a bell-crank gravity-lever R, the horizontal arm r of which lies above a pin n^4 on the plate N, wherefore the swinging movement of the pawl in one direction is limited. On the vertical arm r' is an inclined cam-lug r^2, having cam-surfaces on both its upper and lower sides. A pin j' on the latch-lever lies above this cam-lug. When the plate N is raised, the cam-lug r^2 strikes this pin, and since the lever R cannot rock (being prevented by pin n^4) the latch J is pushed forward, with the result of relieving any key-lever which it was holding down. When the plate moves down, the cam again strikes this pin; but in this case the lever R swings forward until the cam-lug passes over said pin, when the lever falls by gravity into position to again operate as described.

Having described my invention, I claim—

1. In a computing-scale, the combination of a horizontal rate-beam incapable of any substantial endwise movement, with a plurality of fulcrum-blocks immovable lengthwise of said rate-beam but adapted to be separately moved transversely of the beam into and out of engagement therewith, and each with a different but definite point thereon, substantially as specified.

2. In a computing-scale, the combination of a horizontal rate-beam, a plurality of fulcrum-blocks which are incapable of endwise movement relative to said beam, but are movable transversely of said beam into and out of engagement therewith at different but definite points, and means for severally holding said fulcrum-blocks immovable when in engagement with said beam and during the operation of the scale, substantially as specified.

3. In a computing-scale, the combination of the rate-beam, a plurality of vertically-movable fulcrum-blocks, and a key-lever associated with each fulcrum-block whereby said block is moved into engagement with the rate-beam, substantially as described.

4. In a computing-scale, the combination with a rate-beam, a horizontal guide-bar, a plurality of vertically-movable fulcrum-blocks which embrace said guide-bar, springs for raising said fulcrum-blocks, and a plurality of key-levers, each associated with a fulcrum-block and adapted to move it into engagement with the rate-beam, substantially as described.

5. In a computing-scale, the combination of a rate-beam, a plurality of vertically-movable fulcrum-blocks, a plurality of key-levers one for each fulcrum-block, which key-levers are adapted to move said fulcrum-blocks into engagement with the rate-beam, and a latching device for holding down the depressed key-levers, substantially as described.

6. In a computing-scale, the combination

of a rate-beam, a plurality of vertically-movable fulcrum-blocks adapted to be separately moved into engagement therewith, a plurality of key-levers each adapted to so move said fulcrum-blocks, each key-lever having a beveled hook on its under side, and a beveled latch-lever having a shoulder which is adapted to engage with a hook-latch on the key-lever, and latch-releasing mechanism, substantially as described.

7. In a computing-scale, the combination of a rate-beam, a plurality of vertically-movable fulcrum-blocks, with a plurality of key-levers, one for moving each fulcrum-block, and mechanism for preventing the movement of the computing mechanism until after the scale is set by the engagement of one of the fulcrum-blocks with the rate-beam, substantially as described.

8. In a computing-scale, the combination of a rate-beam, a plurality of vertically-movable fulcrum-blocks, an equal number of key-levers adapted to operate the several fulcrum-blocks, and a latching device for holding down the depressed key-levers, with a vertically-movable plate which when in its raised position prevents the operation of the computing mechanism, and means carried by said plate for releasing said latch when moving upward, substantially as described.

9. In a computing-scale, the combination of the connecting-rod, which connects the computing mechanism with the load, said connecting-rod having a cross-bar a^3, with a vertically-sliding plate having a pin which lies below said cross-bar, and means for raising said plate to cause said pin to engage with the cross-bar, substantially as described.

10. In a computing-scale, the combination of the beams A and B, the horizontal rate-beam suspended from said two beams by freely-swinging links, the connecting-rod having a cross-bar a^3, and means for changing the fulcrum-point of the rate-beam, with a vertically-movable pin lying below said cross-bar, and mechanism for moving said pin up into engagement with the cross-bar, substantially as described.

11. In a computing-scale, the combination of a rate-beam, mechanism, which includes a vertical connecting-rod, for transmitting motion from the platform-levers to the rate-beam, a plurality of vertically-movable fulcrum-blocks, an equal number of key-levers for actuating the fulcrum-blocks, and a spring-latch which is adapted to hold down the depressed key-levers, with a vertically-movable plate having a pin which when the plate is raised is adapted to engage with said connecting-rod and prevent its downward movement, a lever pivoted to said plate and having a double-faced cam-lug, a pin on the latch with which said lug engages, a pin for limiting the movement of said lever in one direction, and mechanism for operating said plate, substantially as described.

12. In a weighing and computing scale, the combination of the scale-beam, with a load-supporting mechanism, and connections including a set of keys for determining at what distance from the fulcrum of said beam the load-supporting mechanism shall act, substantially as described.

13. In a computing-scale, the combination of the rate-beam, a fulcrum-block and a pivoted latch having a laterally-projecting pin, with a vertically-sliding plate, a lever pivoted thereto, having on the side adjacent to the latch a double-faced inclined cam which is adapted to engage with said pin, and means for limiting the movement of said lever in one direction, substantially as described.

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

JOHN HENRY SWIHART.

Witnesses:

ALBERT H. BATES,

E. B. GILCHRIST.