

(No Model.)

2 Sheets—Sheet 1.

H. W. BYRON.
COMPUTING MACHINE.

No. 584,458.

Patented June 15, 1897.

Fig. 1.

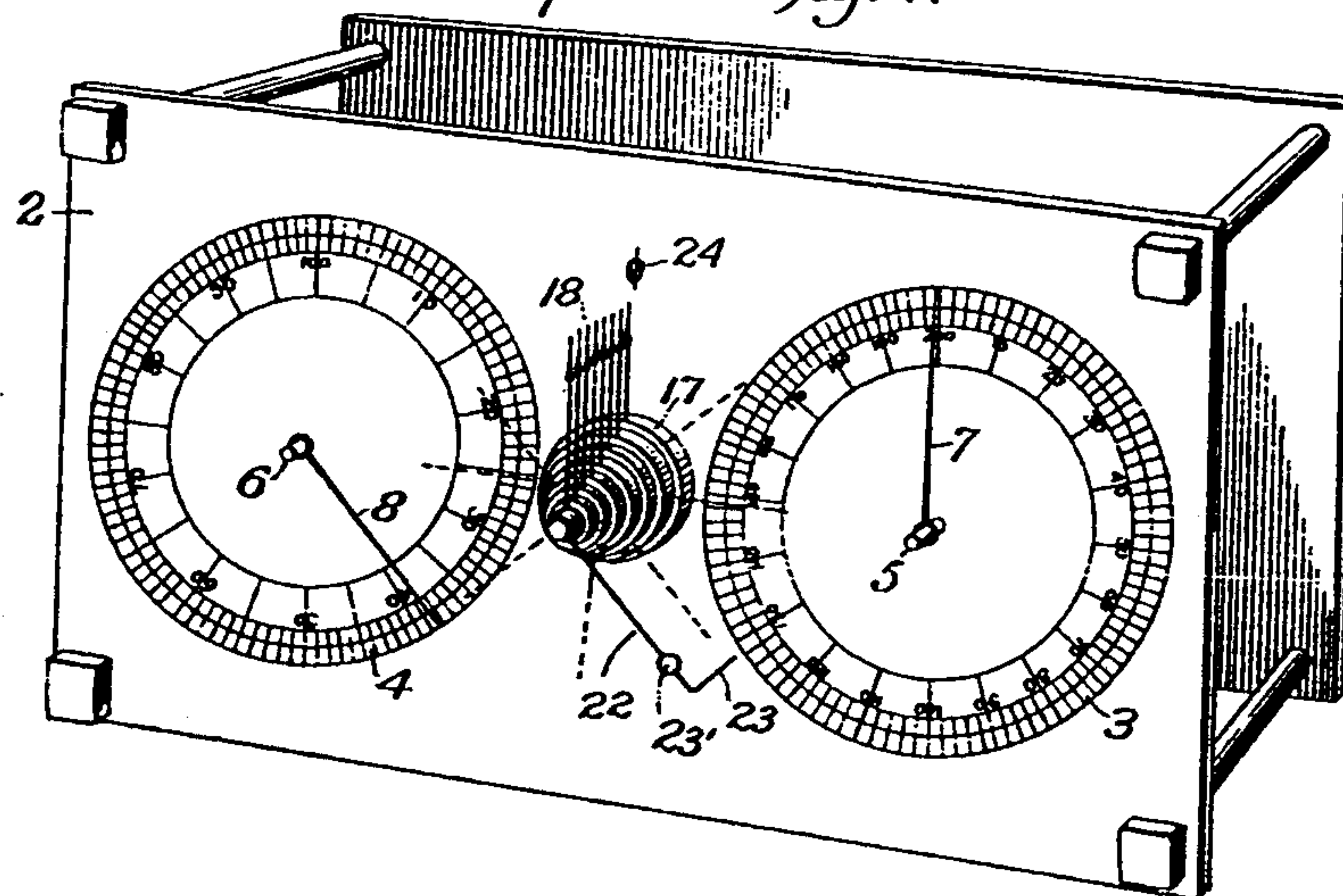
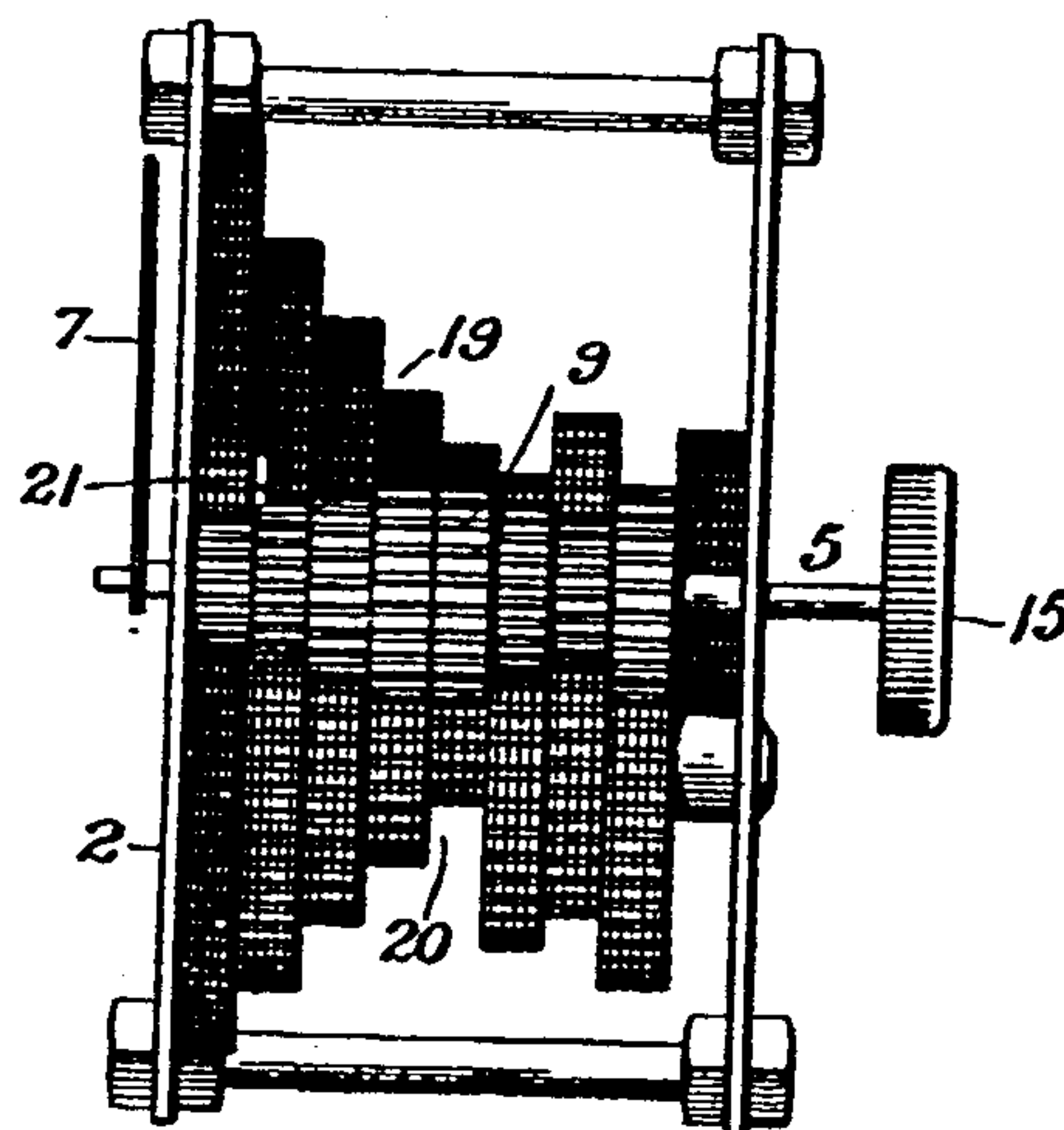


Fig. 2.



WITNESSES
James F. Duhamel
Am. Byrton

INVENTOR,
HAROLD W. BYRON,
By *John H. Kerkhove*
Attorney

(No Model.)

2 Sheets—Sheet 2.

H. W. BYRON.
COMPUTING MACHINE.

No. 584,458.

Patented June 15, 1897.

Fig. 3.

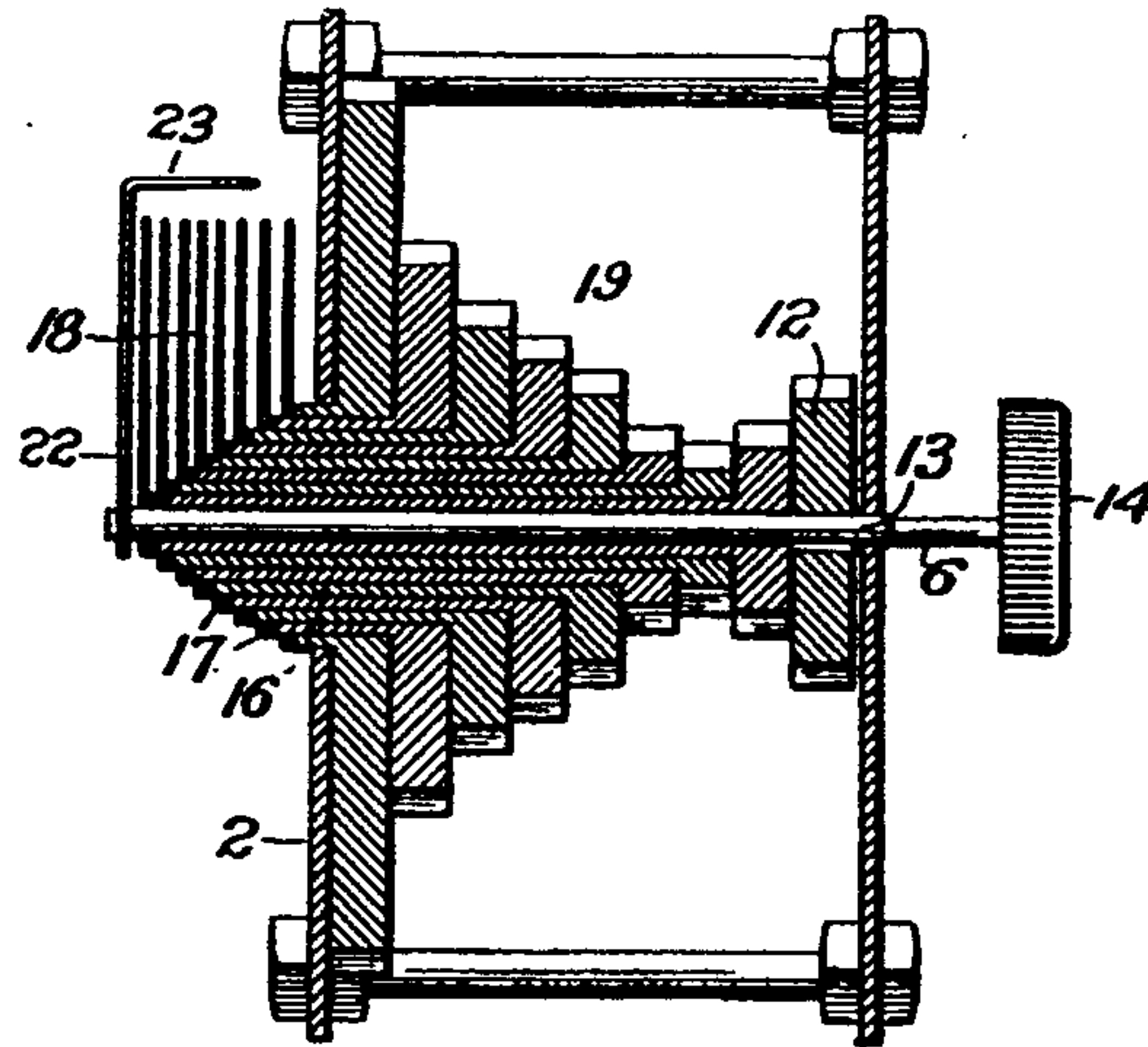
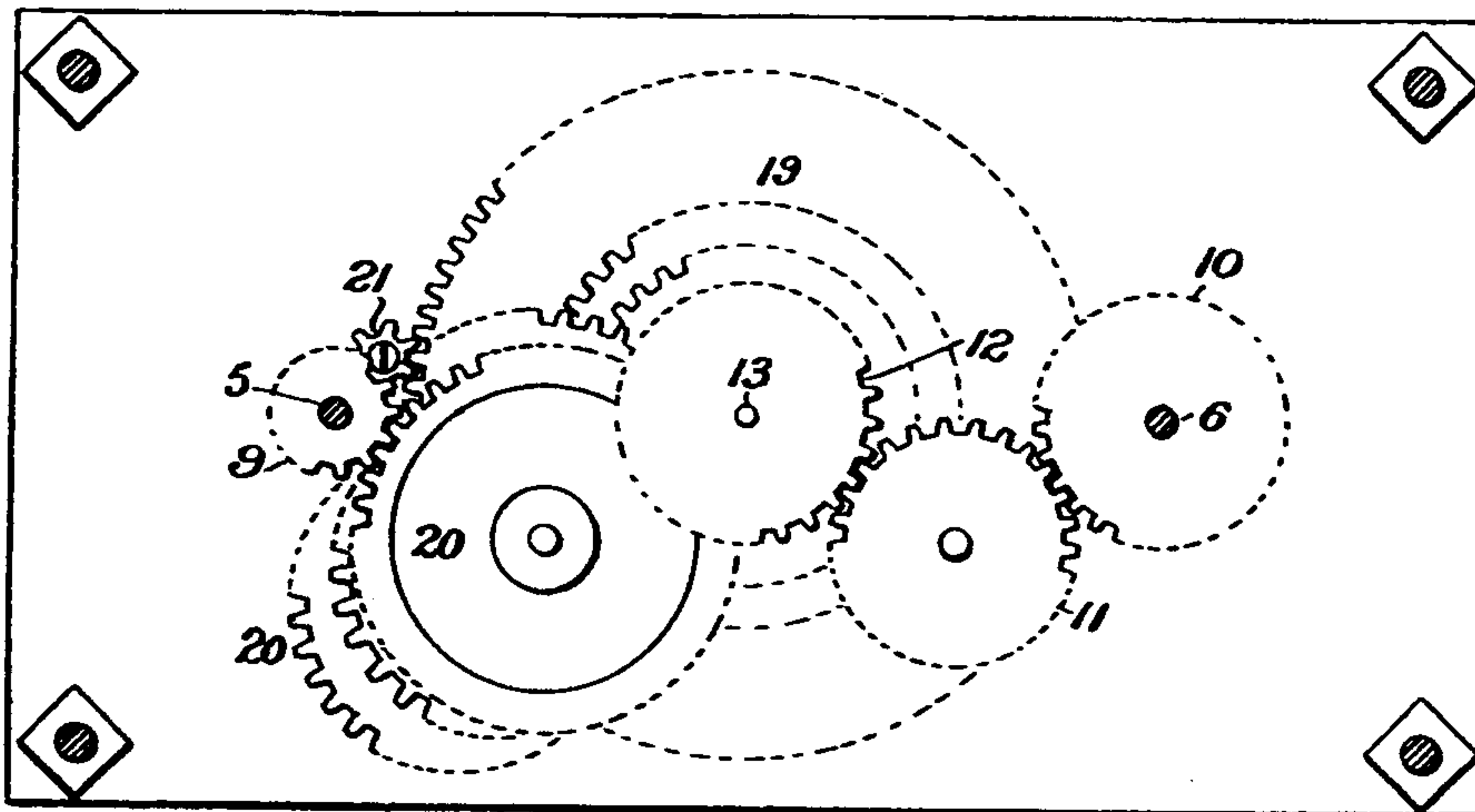


Fig. 4.



WITNESSES
James F. Duhamel
Ass. Expt.

INVENTOR,
HAROLD W. BYRON,
By John H. H. H. H. H.
Attorney

UNITED STATES PATENT OFFICE.

HAROLD W. BYRON, OF MERCERSBURG, PENNSYLVANIA.

COMPUTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,458, dated June 15, 1897.

Application filed March 20, 1897. Serial No. 628,424. (No model.)

To all whom it may concern:

Be it known that I, HAROLD W. BYRON, a citizen of the United States, residing at Mercersburg, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Computing-Machines; 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 computing-machines, and is especially designed to indicate the number of ounces per square foot in a certain quantity of leather or to designate other measurements or conditions of other materials or substances in accordance with a predetermined scale.

In the sale of leather which has been previously measured by a measuring-machine and the weight ascertained it is hard to determine the weight by ounce per square foot which is necessary and exceptionally convenient in order to determine comparatively the price of a quantity of leather which may be sold, and it is for this purpose that the device which will be hereinafter set forth is constructed and arranged.

The invention consists, essentially, of a dial-plate having two oppositely-situated dials thereon, which in this instance represent feet and pounds, and an intermediate gang of hands superimposed one above the other and adapted to be consecutively spread apart, over which an indicator revolves and acts conjointly with one of the hands of the aforesaid dials.

The invention further consists in the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

The object of the invention is to provide convenient means for rapidly ascertaining the number of ounces per square foot of leather, in view of the variation in the thickness and other conditions which exist in said material.

In the drawings, Figure 1 is a perspective view of a computing-machine embodying the invention and showing the hands on the dials and also the intermediate gang of hands

in operative position. Fig. 2 is a side elevation of the computing-machine, showing the internal mechanism. Fig. 3 is a transverse vertical section on the line *x x*, Fig. 2. Fig. 4 is a central longitudinal vertical section of the machine.

Referring to the drawings, wherein like numerals of reference are employed to indicate corresponding parts in the several views, the numeral 1 designates a suitable form of casing supporting a dial-plate 2, having on the right-hand portion thereof, as shown in the accompanying drawings, a dial 3, divided to represent square feet. On the opposite portion of the dial-plate is a second dial 4, which is divided to represent pounds avoirdupois. Extending through the central portion of the dials 3 and 4 are arbors 5 and 6, on which are mounted hands or indices 7 and 8. On the arbor 5 are rigidly mounted a series of pinions differing in diameter, for a purpose which will be more fully hereinafter set forth. Rigidly secured to the arbor 6 is a pinion 10, meshing with an idler 11, secured to an adjacent portion of the casing, and the said idler in turn meshing with a pinion 12 on the end of a central arbor 13.

The ends of the arbors 5 and 6 project through the rear portion of the casing of the machine a suitable distance and have mounted thereon preferred forms of milled heads 14 and 15, by means of which the parts of the machine are operated. On the said arbor 13 are independently mounted a series of sleeves 16, which vary in length and extend above or outward from the dial-plate 2 at unequal distances and have attached thereto a series of disks 17, carrying a series of hands 18. It will be observed that the said disks 17 are superimposed or arranged in a pile and decrease in diameter toward the outer end of the central arbor 13 to provide a neat appearance and also to afford convenient means for operating the said series of hands and making the proper calculations therefrom. On the said arbor 13 and independently connected to the sleeves 16 are a series of gear-wheels 19, arranged in the form of a cone-gearing, with the largest gear adjacent to the dial-plate 2 and operating the innermost hand of the series of hands 18, and the

remaining gears decreasing in diameter gradually toward the rear of the casing. This construction permits the said series of hands 18 to be moved consecutively and at proper 5 times—that is, the innermost hand moves slower than the next succeeding hand, and so on through the series. The said gear-wheels 19 mesh with idlers 20, mounted in the casing adjacent thereto and of such diameter 10 as to accomplish the desired result and the proper positioning of the hands 18. The said idlers 20 in turn mesh with the series of pinions 9 on the arbor 5, but in addition to the said idler 20 the uppermost or outermost pinion 15 9, or that nearest the dial-plate 2, meshes with an idler 21, which in turn engages the largest gear-wheel of the series of said wheels 19. Thus it will be seen that by operating the arbor 5 in turning the hand or index 7, 20 carried thereby, over the face of the dial 3 the said idlers 20, as well as the idler 21, will be simultaneously operated, and in turn actuate the series of gear-wheels 19, which are of such diameter as to spread the hands 18 25 equally apart in regular succession and consecutively, which operation will continue as long as the arbor 5 is revolved.

On the outer end of the central arbor 13 is secured an indicator 22, which moves over 30 the series of hands 18 and for the purpose of convenience has its outer end bent inwardly at an angle, as at 23. As heretofore set forth, the idler 11 meshes with the pinion 12 on the arbor 13, and the said idler is actuated by the 35 pinions 10 on the arbor 6, and as the latter is revolved the said indicator 22 is caused to simultaneously move over the series of hands 18. The indicator is also formed with a small opening 23' at its outer end, through which 40 the exact position of the hand underneath may be readily determined with accuracy. The said series or gang of hands 18 have their outer ends preferably in alinement—that is, they are arranged so as not to project mate- 45 rially beyond each other—and although these hands may be used without any designating numbers or characters it is proposed for various purposes to have the said hands supplied with numerals arranged in succession 50 or with any other suitable characters or symbols. On the said dial-plate, adjacent to the said hands and the indicator, when the latter are in normal position, will be applied a zero-mark 24, which will form a guide in ar- 55 ranging the hands when the machine is not in use. The form of gearing heretofore set forth may be varied in many ways and the desired result will be equally well attained.

The machine or device as shown in the accompanying drawings is especially designed 60 to determine the number of ounces in a square foot of leather, but it will be understood that the several dials and the series of hands may be arranged to compute board-measure or for 65 any other purpose to which the device may be found applicable. In the present instance the dial 3 is divided and marked to indicate

square feet and the dial 4 pounds avoirdupois, as heretofore stated, and in computing the number of ounces per square foot in a piece 70 of leather the hand or index 7 is turned over its dial to the number representing the total square feet in the piece of leather being operated upon. When the said hand or index 7 is so operated, the series of hands 18 are spread 75 apart equal distances from each other, as fully shown in dotted lines, Fig. 1. The index or hand 8 is then moved over the dial 4 to the number of pounds corresponding to the weight of the piece of leather, and at the 80 same time the indicator 22 moves over the hands 18. In order to ascertain the number of ounces per square foot, the said hands 18 are counted from the zero-point to the position of the indicator, when the mean average 85 per square foot can be readily ascertained. It will be observed that eight of the hands 18 are employed, each representing an ounce, and by this means the fractional part of a pound below the number of ounces repre- 90 sented by the hands can be readily calculated. Of course the number of hands 18 can be increased or diminished, as may be desired, but, as the dial 4 is divided into pounds as a whole, it will be seen that the hands 18 should 95 be arranged to represent the fractional parts of a pound. If the hands 18 have numerals thereon or other characters, a reading therefrom can be readily made without counting 100 the number of hands, and when the indicator is positioned between any two hands it is read one-half, or if the said indicator be positioned one-fourth the distance between the two hands it will be read one-fourth, and so on.

The device set forth will be also useful in 105 measuring duck carpet, which is sold by weight or the number of ounces to a foot. A further and most advantageous use is that it can be readily converted into a multiplying-machine by reducing the dial representing 110 pounds to its equivalent in ounces. Any number on the feet-dial can be multiplied, by first placing the hand on said latter dial to the given number, by any number from one to eight, or according to the number of hands 115 on the machine, and the product would be found on the pound-dial. For example, set the feet-dial at "200" and multiply by five by placing the indicator squarely over the fifth hand. Then the product would be found 120 on the pound-dial, and as the machine is now arranged it would be sixty-two and one-half pounds, equal to one thousand ounces.

The machine or device as set forth may be constructed in any form or size, and the posi- 125 tion of the dials 3 and 4 may be changed without detracting from the operation of the machine, and it is also obviously apparent that many minor changes in the details in the construction and arrangement of the several 130 parts might be made and substituted for those shown and described without in the least departing from the nature or spirit of the invention.

Having thus described the invention, what is claimed as new is—

1. In a computing device or machine, the combination of a series or gang of hands, an indicator coacting therewith, and adjacent dials provided with movable indices, substantially as described.

2. In a computing device or machine, the combination of dials having indices movable thereover, an intermediate series or gang of hands, an indicator coacting with said gang of hands, and mechanism for operating the several parts, substantially as described.

3. A computing device or machine comprising a series of superimposed rotatable hands movable around a common center, an indicator movable over the said hands, adjacent dials provided with movable indices, and gearing for operating the several parts, substantially as and for the purposes specified.

4. A computing device or machine, comprising a series of superimposed rotatable hands movable around a common center, an indicator relatively operated to move over the said hands, adjacent dials provided with movable indices, a dial-plate having a designating normal mark thereon, and operating

mechanism for the several parts, substantially as and for the purposes specified.

5. In a computing device or machine, the combination of two dials having indices movable over the faces thereof, a series or gang of hands operating simultaneously with the movement of the index on one of the dials, and an indicator operated simultaneously with the movement of the index on the opposite dial, substantially as described.

6. A computing device having two independently-operating dials, and a gang of hands and an indicator respectively actuated and controlled by the individual operation of said dials.

7. A computing device having independently-operated dials, and intermediate indicating devices controlled by the individual operation of said dials.

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

HAROLD W. BYRON.

Witnesses:

SAMUEL BYERS,
LEWIS T. BYRON.