

B. W. OGBURN.
CALCULATING BALANCE.

No. 80,003.

Patented July 14, 1868.

Fig. 1.

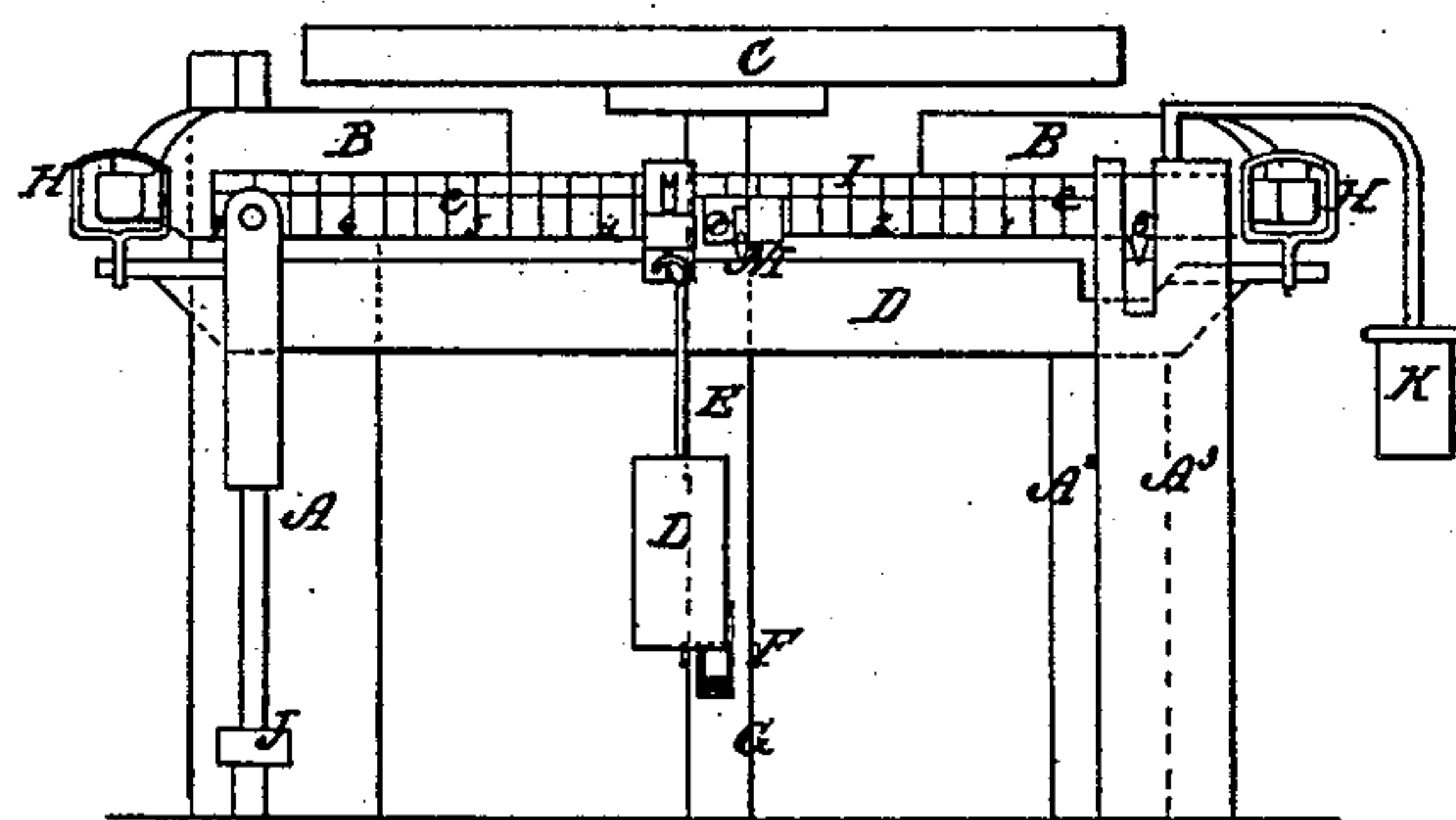


Fig. 2.

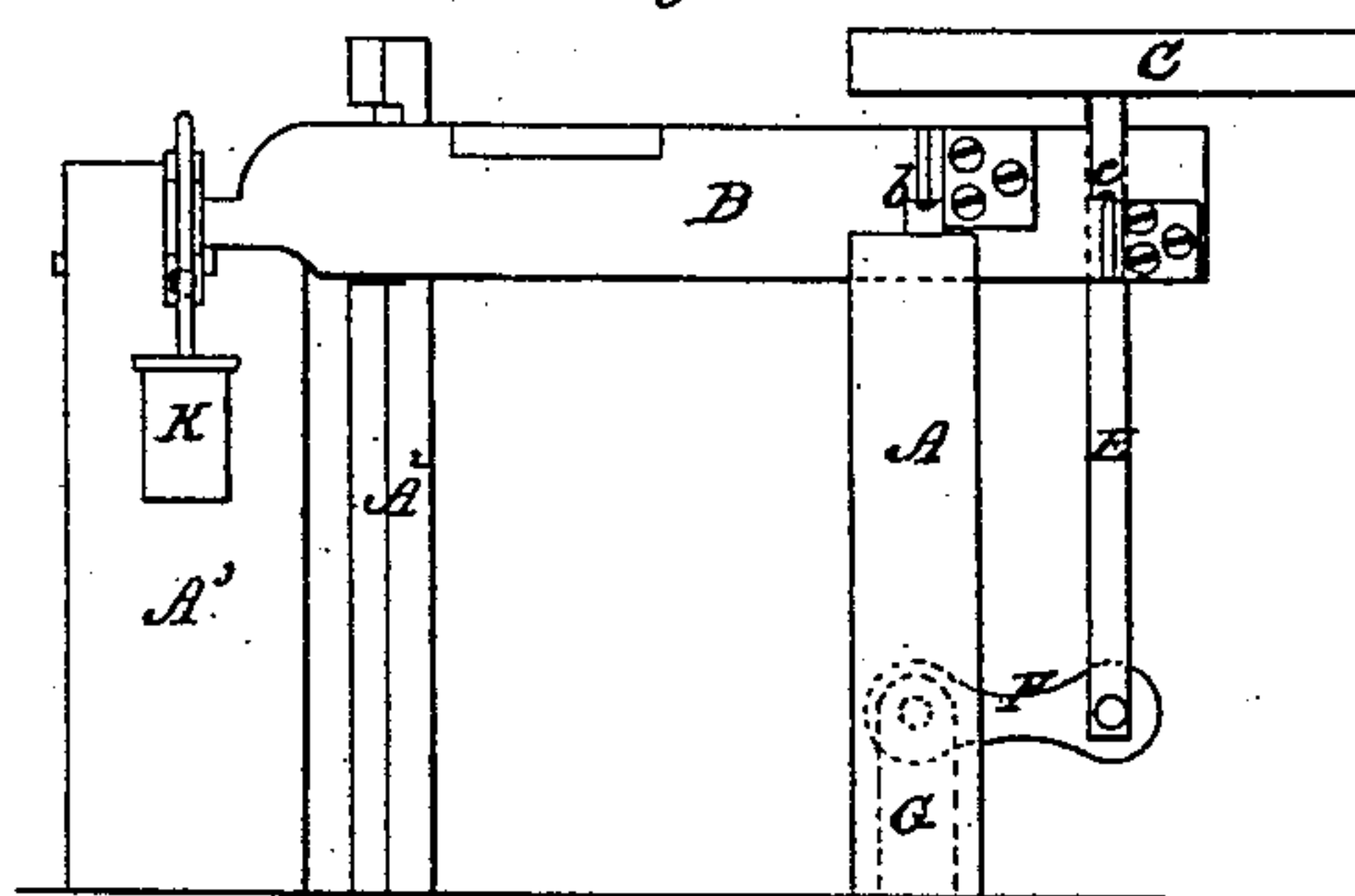
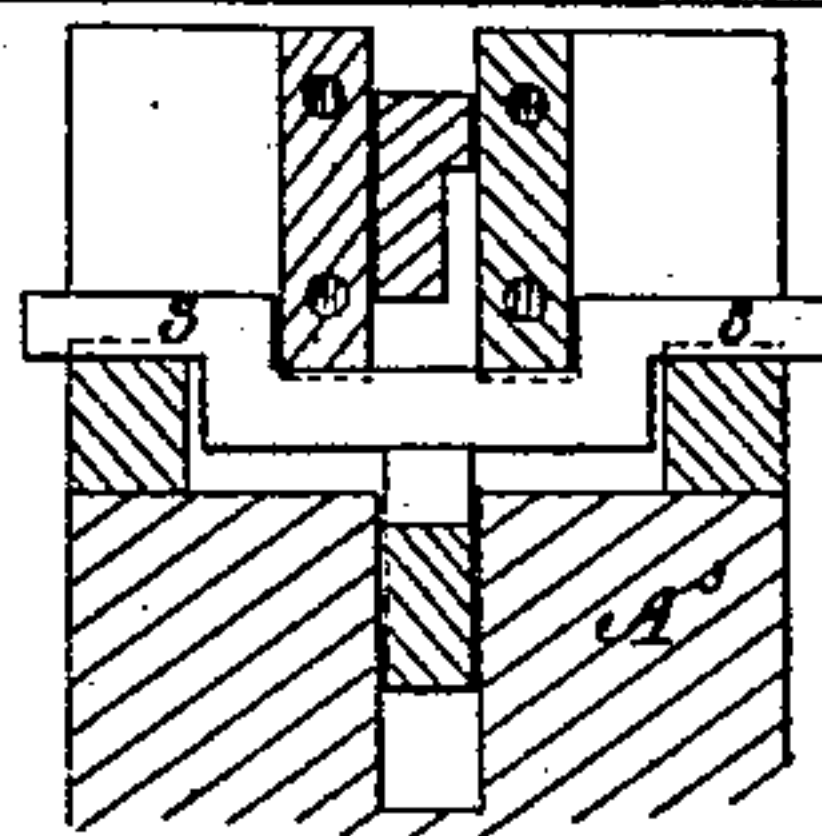


Fig. 3.



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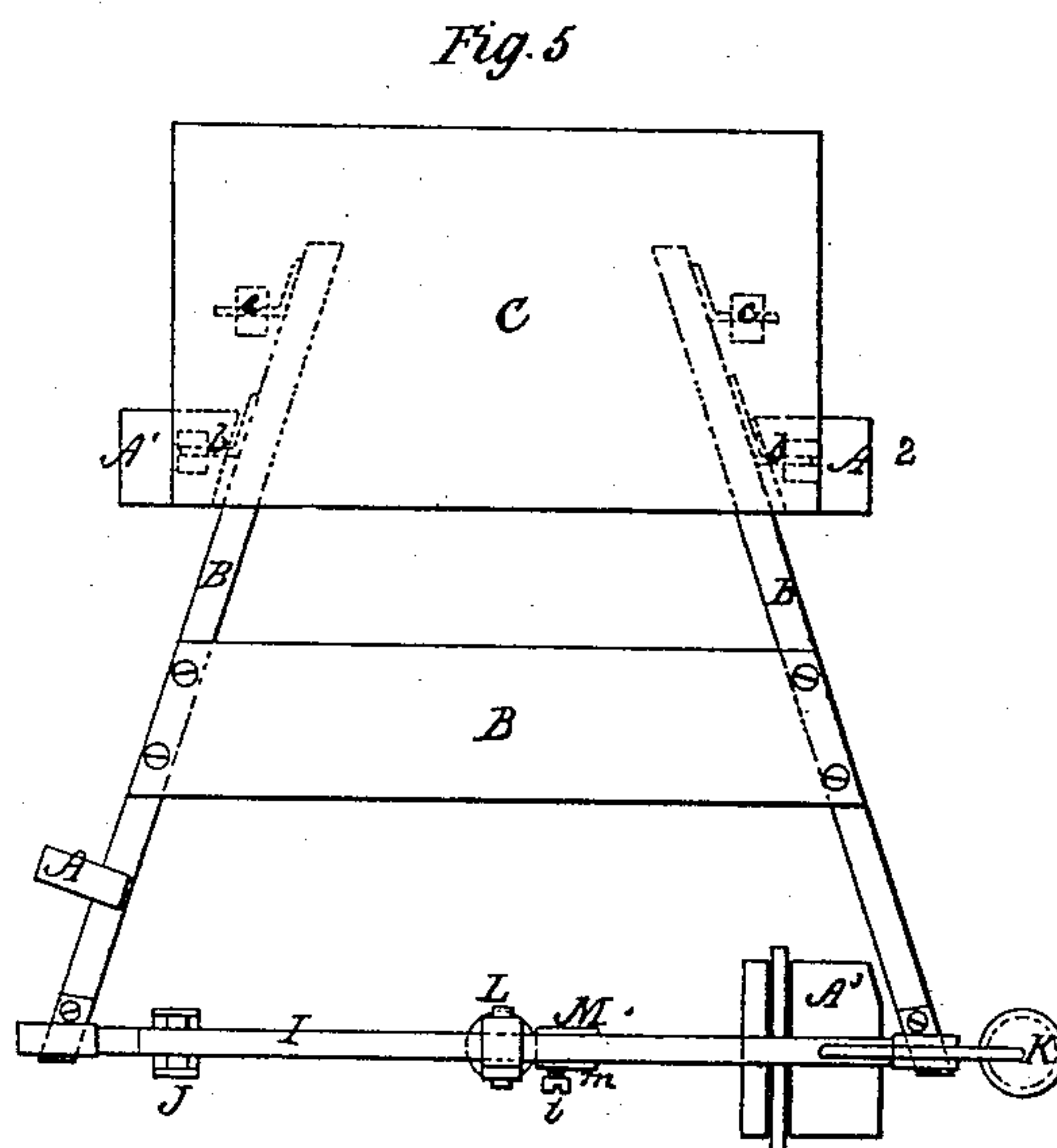
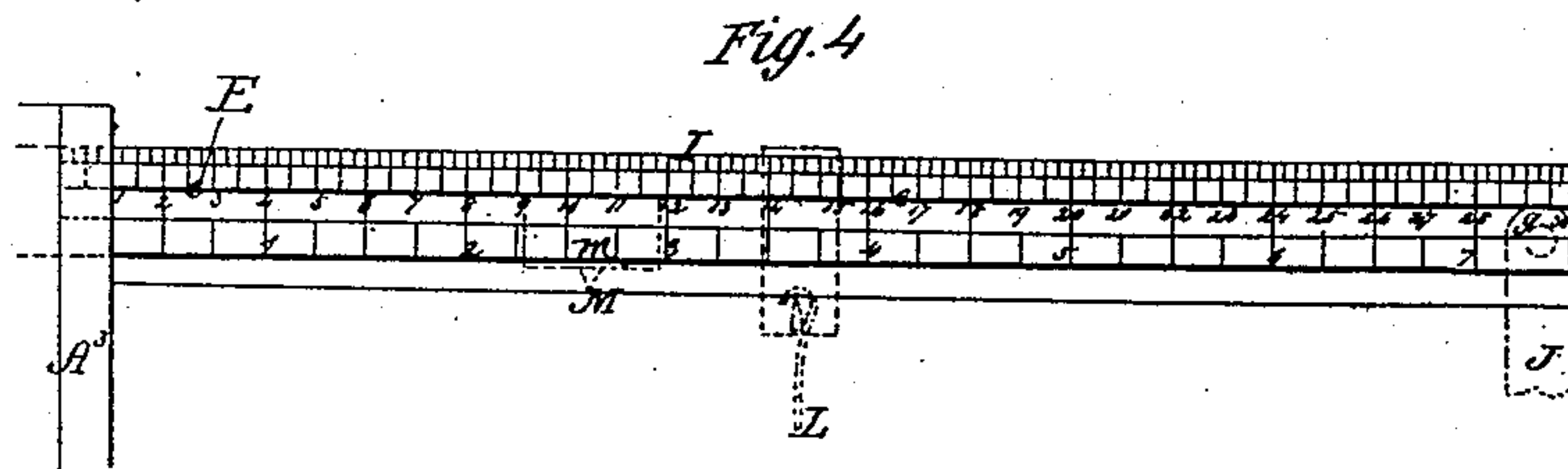
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Attorneys

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2 Sheets—Sheet 2.

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United States Patent Office.

BENJAMIN W. OGBURN, OF WHITTLE'S MILLS, VIRGINIA.

Letters Patent No. 80,003, dated July 14, 1868.

IMPROVED CALCULATING-BALANCE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, BENJAMIN W. OGBURN, of Whittle's Mills, in the county of Mecklenburg, and State of Virginia, have invented a new and improved Calculating-Balance; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a front elevation.

Figure 2 is an end elevation.

Figure 3 is a detached view of the fulcrum *s*.

Figure 4 is a detached rear view of the balance-beam *I*.

Figure 5 is a top view.

The object of this invention is to provide a simple, cheap, and easily-operated balance, which will indicate either the weight of an article or its gross price.

In the drawings, *A* *A*¹ *A*² *A*³ are four standards, and *B* is a balanced frame, resting upon a fulcrum, *b b*, and supporting at its rear end a platform, *C*, and at its front end a bar, *D*. The platform rests upon sharp-edged metallic bearings *c c*, and is steadied and prevented from tipping by means of an arm, *E*, firmly attached to the centre of the under side of the platform, and at its lower end hinged to a pivoted arm, *F*, supported by a short post, *G*, under the platform.

The bar *D* is suspended from the front end of the side beams of the frame *B* by means of stirrups *H H*. One end of it passes through the standard *A*³, as seen in fig. 1, and moves up and down in a slot in said standard, as the frame *B* librates on its fulcrum. The frame *B*, platform *C*, and bar *D* are so arranged and weighted that one-quarter of a pound applied at the bar will exactly balance one pound applied at the platform.

In connection with this apparatus, I use a graduated balance-beam, *I*, extending directly over the bar *D*, and pivoted at *s* in the slot in the post *A*³. The ends of this beam are weighted, as seen at *J K*, in such a manner that the beam is exactly poised upon its fulcrum. It is provided with a heavy pea, *L*, and a sliding adjustable fulcrum, *M*, having a sharp edge, which rests directly across the upper side of the bar *D*, and can be adjusted to any point along the bar. I usually attach the fulcrum to a clasp, *m*, the edges of which run in grooves *e e* along the side of the balance-beam. A set-screw, *i*, is provided, by which the sliding fulcrum can be fixed at any desired point.

All the fulcra used about the device are made of metal, reduced to a fine edge, so that the balance will yield to the slightest pressure. The form of the fulcrum *s*, upon which the beam *I* is balanced, is clearly shown in fig. 3.

The operation of an apparatus constructed in this manner is as follows:

The article to be weighed is placed upon the platform *C*, when one-fourth of its weight, applied at the beam *D*, will balance it. This weight is applied by the pea *L*, through the sliding fulcrum *M*, in the following manner: Suppose the pea to weigh a pound itself, then, by placing the sliding fulcrum over the figure 1, on the graduated beam, and by placing the pea over the centre of the slide, or over the figure 1 also, exactly one pound pressure will be exerted upon the bar *D*. By placing the sliding fulcrum *M* at the figure 2, and the pea at the figure 1, exactly one-half pound pressure will be exerted on the bar. The same result will follow if we place the sliding fulcrum at any figure, and the pea at exactly one-half that figure, and it is only necessary to vary the proportion to one-third, one-fourth, &c., to obtain one-third of a pound, one-fourth of a pound, &c., pressure upon said bar.

On the other hand, by placing the sliding-fulcrum at 1, and the pea at 2, 3, 4, 5, &c., we may produce four, six, eight, ten pounds' pressure upon the bar *D*, and balance sixteen, twenty-four, thirty-two, forty pounds, &c., on the platform. And if, by running the pea out to the end of the beam, and placing the sliding fulcrum at 1, we are not able to produce force sufficient to balance the platform, then we should have a set of weights, ten pounds, one hundred pounds, &c., to hang upon the weight *J*, by which means any amount of weight upon the

platform can be balanced. It is evident that when the article to be weighed is of more than four pounds' weight, the sliding fulcrum must be placed between the pea and the post A³. If of less than four pounds' weight, the pea must be placed between the fulcrum and the post; if exactly four pounds' weight, the pea and the fulcrum may be placed together at any figure on the beam. If we wish to weigh a fraction of four pounds, we place the fulcrum at any figure, and the pea at the fraction of that figure. If we wish to weigh any multiple of four pounds, we place the fulcrum at any figure, and the pea at the multiple of that figure.

Making use of this principle, I am enabled to construct my balance so that it will indicate not only the weight of an article, but may also be employed to indicate how many pounds, at any given price, it will take to amount to any given sum.

For convenience in adjusting my balance to this purpose, I usually make the parts so that one pound at the bar D will balance four at the platform, and then use a quarter-pound pea on the graduated beam I, which, when over the sliding fulcrum, will always exactly balance one pound on the platform. I then graduate one side of the beam I (usually the rear side) for this particular purpose, laying it off into, say, one hundred equal parts from the fulcrum *s*, as a starting-point, and numbering the degrees or equal parts. Then suppose I desire to know how many pounds of any article, at six and a quarter cents per pound, will come to twenty-five cents; I place the fulcrum at $6\frac{1}{4}$ and the pea at 25 on the scale, and pour the article upon the platform till the beam rises. By this means the retail trader will be enabled to use the balance to great advantage. The customer will ask for, say, fifty cents worth of an article; the trader fixes the pea at 50, then sets the fulcrum at the price per pound, and the balance rises to indicate when the proper quantity has been placed upon the platform.

The same principle may be used in buying as well selling, the operation being reversed. For instance, some person offers the trader an unknown quantity of any article, for which he is at that time paying twelve and a half cents per pound; he places the fulcrum at $12\frac{1}{2}$, puts the article on the platform, and slides the pea back and forth till it balances the platform. The figure at which it stands will indicate the gross price of the article offered for sale to the trader.

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

The combination of the sliding fulcrum M and pea L, when working upon a graduated beam, I, in connection with a balanced frame, B, the parts being constructed and arranged as described, so as to operate together in the manner and for the purpose set forth.

To the above specification of my invention I have signed my hand, this 23d day of March, 1868.

B. W. OGBURN

Witnesses:

CHARLES A. PETTIT,
SOLON C. KEMON.