

C. C. LYMAN.
SCALE.

No. 79,583.

Patented July 7, 1868.

Fig:1.

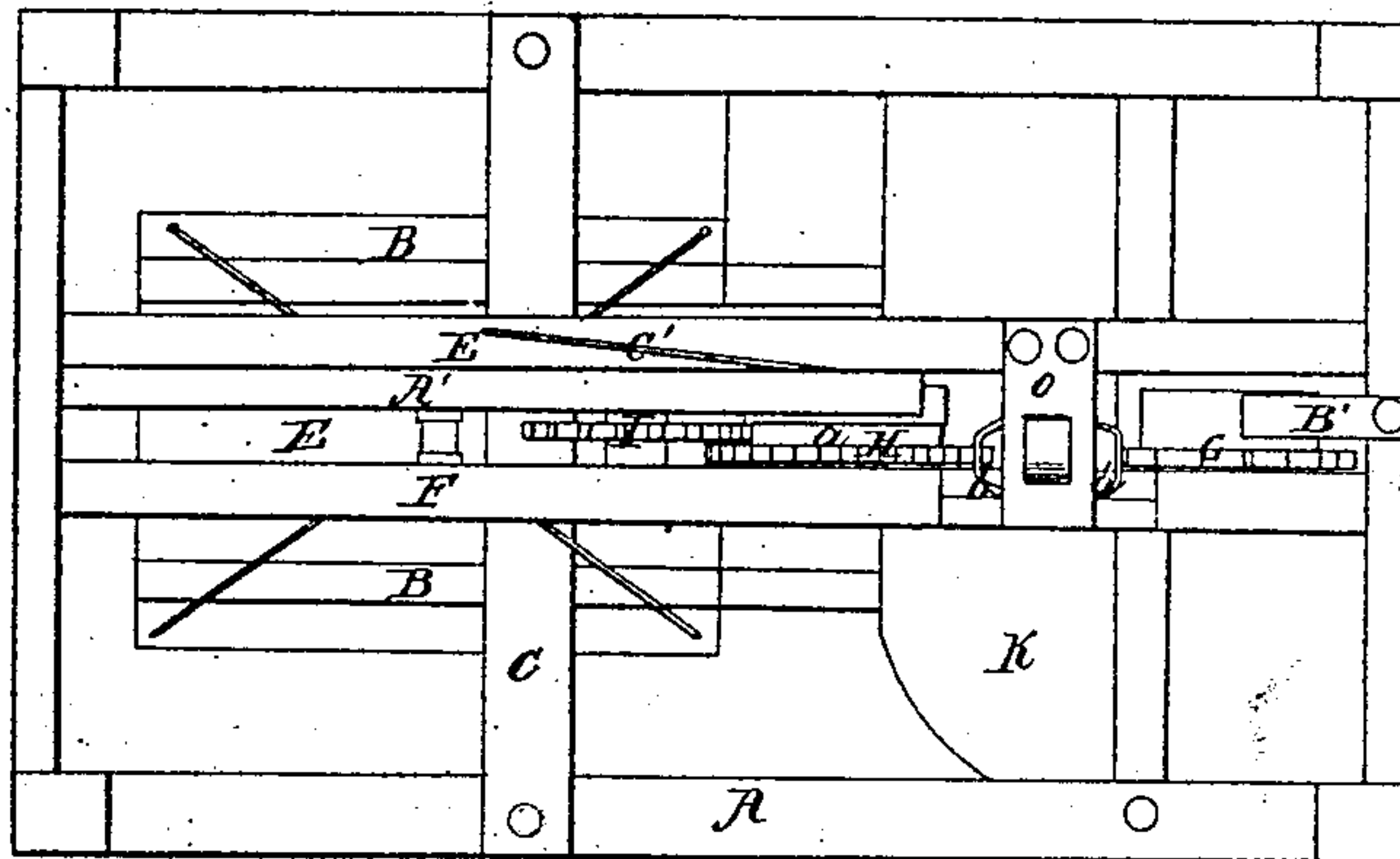


Fig: 2.

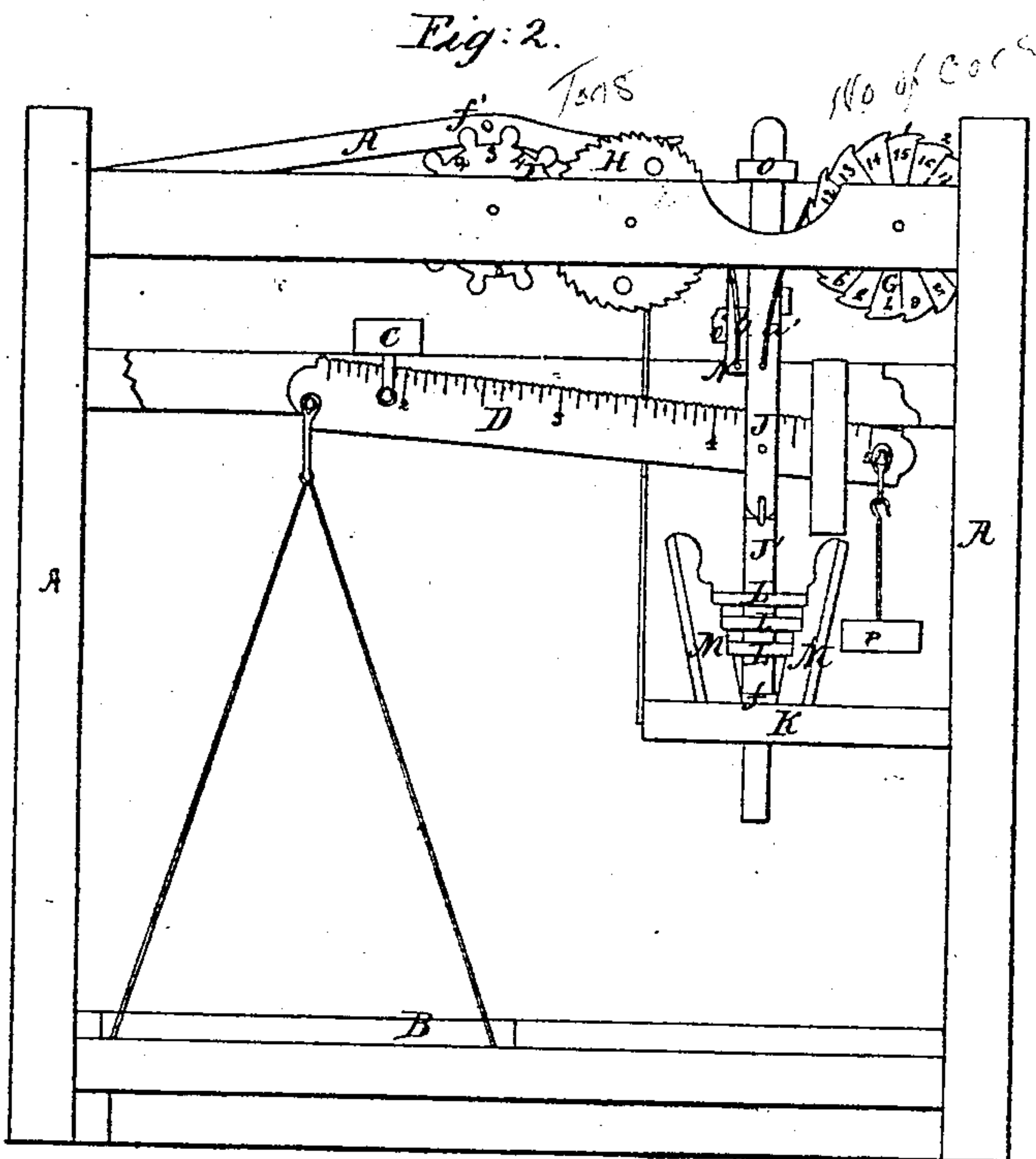
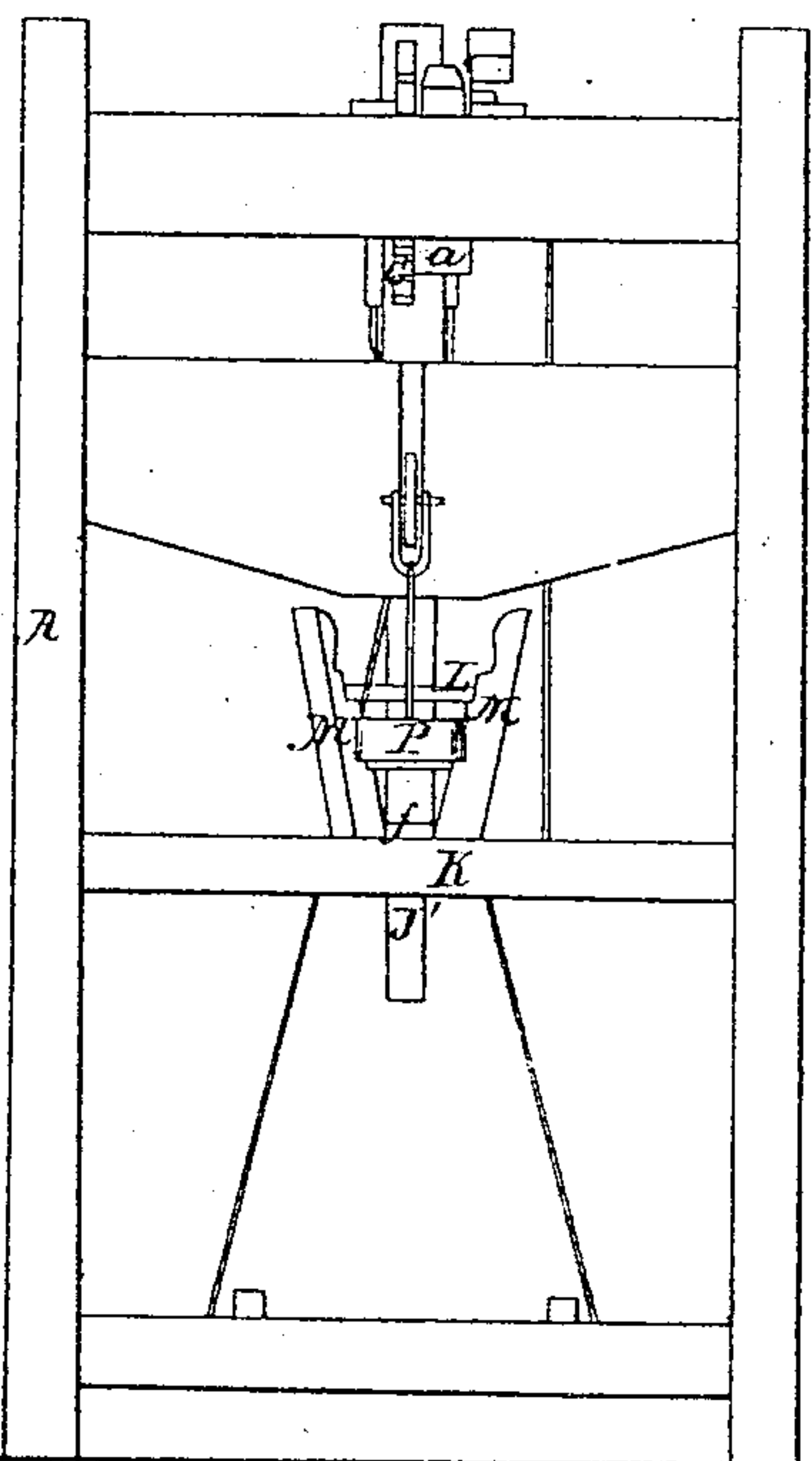


Fig. 3.



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C. C. LYMAN, OF EDINBORO, PENNSYLVANIA.

Letters Patent No. 79,583, dated July 7, 1868.

IMPROVEMENT IN SCALES.

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, C. C. LYMAN, of Edinboro, in the county of Erie, and State of Pennsylvania, have invented certain new and useful Improvements in Scales; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of the scale.

Figure 2 is a side view.

Figure 3 is an end view.

Like letters of reference refer to like parts in the views.

In fig. 2, A represents a frame or beam-house erected near to the railroad-track B, fig. 1. From a cross-beam, C, is suspended the scale-beam D, from the short arm of which depends the scale-platform E, provided with a section of rails forming a part of the track.

Between the cheeks of the longitudinal beams F, fig. 1, is journaled a ratchet-toothed wheel, G, fig. 2, on which is inscribed a numeral index, to which reference will hereafter be made.

H is also a ratchet-wheel, journaled between the cheeks of the beams in like manner as the wheel G.

I is a lug-wheel, so journaled in the beams as to engage with the wheel G by means of lugs *a* projecting from the face of a drum, secured to the side of said wheel H. This lug-wheel is also inscribed with a numerical scale, to which reference will be made.

J, fig. 2, is a jointed lifting-shaft, the lower section of which, J', penetrates loosely the platform K.

L L are counterbalance-weights, through which the shaft loosely passes.

M are brackets by which said weights are supported and held in the position separately from each other, as shown in the drawing, when not in immediate use. The purpose of the weights will hereafter be shown. The upper section of the shaft is provided with a slot, through which the scale-beam D passes, and in which it is pivoted.

a', fig. 2, is a yoke or loop, the ends of which are pivoted in the sides of the shaft, whereas the bow reaches up and engages in the teeth of the wheel G.

The block N referred to, is attached loosely to the shaft by the key *c*, fixed in said shaft, and projected through the block, a slot being made in the block for its admission. The said slot being made much longer than the width of the key, allows the key to play a certain distance in the block before reaching the upper end of the slot, whereby the block and loop are lifted upward, as and for a purpose hereafter shown.

O is a stay, by which the upper end of the shaft is guided and secured in position.

The purpose of this machine is for weighing one-half of each car of a train separately on a short platform while in motion, and registering the same automatically, whereby the entire weight of the train is obtained, thus avoiding the necessity of stopping the train for that purpose, and which is accomplished as follows:

As above said, the scale-platform B forms a part of the track. The length of this platform is such as to receive one set of the front or the hind wheels of the cars at once only; thus while the front wheels are on the platform, the hind wheels will not be, and when the front wheels have passed over and off from the platform on to the track, the hind wheels will be on the platform. It will be obvious that by this, one-half only of the car and load will be weighed at once in its passage across the platform.

Presuming that each car contains twenty tons, now, as one-half only of this is to be weighed at once, the poise P on the pendulum must be adjusted to that particular weight, ten tons. As the front wheels of the car roll upon the platform, the scale-beam is thrown up, in consequence of the weight of the car. The beam will carry up with it the shaft J, which, as above said, is pivoted to the beam. As the shaft is raised upward, the yoke *a'* is also carried up just far enough from a lower tooth to one next above, and hooks upon it. Immediately that the wheels roll off the platform, the beam descends, drawing down with it the shaft J and yoke, which, as a consequence, will turn the index-wheel G around one tooth or notch, from 1 to 2, thereby indicating ten tons

as one-half of the load. The rear end of the car, as it rolls on to the platform, will in like manner throw up the scale-beam, as did the front end, but which will again descend as the car leaves the platform, thereby turning the index-wheel another notch, indicating the second ten tons as the weight of the hind end, making twenty tons as the whole weight of the load. As the front end of the second car rolls on to the platform, the scale-beam goes up as it did for the front of the first car, and descends again, and again goes up as before, when the front end rolls off and the hind end rolls on. Each time the index-wheel is turned twice for each car, giving two distinct registers for each car as it passes over the scale-platform.

It has been presumed that each car contained twenty tons, the pendulum-weight P having been gauged to that particular sum; but it will be obvious that a less number of tons will raise the shaft, and turn the index-wheel, by reducing the pendulum-weight P; therefore, by graduating this weight to any particular number of tons, will cause the shaft to turn the index-wheel, and thereby indicate each car passed over, to the number of sixteen, as shown on the wheel.

The passage of a greater number of cars may be indicated by the addition of supplementary index-wheels, in connection with the wheel H, and thereby any number of cars be registered. Should the weight of the load fall some short of the presumed twenty tons, for which the balance had been adjusted, the loops *a* will still be raised to the required height to catch the proper notch for turning the index-wheel G, if the deficiency be not too great, as it is not intended to weigh to a very exact degree the train of cars, a close approximation only being desired.

Should a car or cars contain an excess of twenty tons, or any number of tons to which the adjustment of the scales had been made, the shaft J will be thrown upward higher, the result of which will be to push up the slide-block N, so that the loop *b* will be lifted from a lower tooth, on which it is caught, to one or more above, which, as the shafts descend, will cause the wheel H to turn more or less, as the number of teeth that the loop may have passed over, one, two, or more, as the case may be.

The number of teeth in this index-wheel is sixty, each tooth indicating one hundred pounds, three tons; hence it will be obvious that if a loaded car contain an excess of twenty tons, it will be indicated by the wheel H, for the excess of weight will cause the shaft to rise up so as to carry upward the yoke *b*, which will be caught on a tooth above, when the descent of the scale-beam and shaft will turn the wheel one or more teeth, which will indicate one or more hundred pounds in excess of the twenty tons which the car was presumed to contain.

Should the excess of weight be very great, the index-wheel H will be caused to make one revolution, which will be indicated by the lug-wheel I, which is operated by the lug *a* above referred to. This lug, as it comes around, engages in the lugs of the wheel I, and thereby turns it from one figure to another, each figure or lug indicating one ton, the whole number being ten. The arrangement and gradation of the wheels H and I are such that for each quarter of a revolution that H may make, will turn the wheel I one degree or figure, indicating one ton; hence one complete revolution of the index-wheel H will be indicated by the lug-wheel, viz, three tons.

It will be obvious that by this arrangement of the index-wheel H and lug-wheel I, the excess of twenty tons that one or more cars may contain is known and registered, though not with the extreme exactness necessary for close weighing; yet sufficiently close for all railroad purposes, a close approximation being all that is required, and great facility to determine that, and which are both obtained in this machine.

The practical use of the counter-weights L referred to is to relieve the weight-beam from a too sudden and violent upward movement, as cars of different weight first roll upon the platform.

The shaft, on being suddenly raised upward by an excess of twenty tons, say one hundred pounds or more, would raise the yoke *b* one notch, if applied gently, but in consequence of being suddenly applied, would throw the beam up so as to cause the loop *b* to pass over two notches or more, and thereby indicate a greater excess of weight than really upon the truck. To prevent this, and cause the yoke to engage one notch only, if one hundred pounds is the excess, the collar *f*, fig. 2, fixed to the lower end of the shaft, will engage and lift upward the weight L, which is supposed to weigh one hundred pounds, thus corresponding to the weight registered on the wheel H for each notch. In consequence of this additional weight the beam has to carry up, it will not rise high enough to engage more than one notch, but should the excess of weight be two hundred or more, enough to raise the yoke two notches, the second weight, L, will also be carried up with the first one, making two hundred pounds, equal to two notches, but not three, unless suddenly thrown upwards without the said weights. Should the excess of weight exceed three hundred pounds, which would carry the yoke three notches, and possibly four, if not restrain the third weight, is, together with the first two, making three hundred pounds, which will restrain the yoke from rising above the notches and catching on a fourth, and so on, for any number of notches, the weights may be multiplied, three only being here shown.

A', fig. 2, is a check or lock, the purpose of which is to prevent an unrequired turning of the lug-wheel. A pin, *f'*, projecting from the side of the lever, between the lugs, will, as the wheel may turn, be restrained by the lugs engaging the pin, and thereby confined in one position until the pin is lifted from between the lugs, by a lug, *a*, projecting from the drum attached to the wheel H, which, as the wheel revolves, will pass under the end of the lever, lifting it up, thereby disengaging the pin from the lugs at the proper time for the lug-wheel to revolve.

B', fig. 1, is a tension-spring, the purpose of which is to restrain the movement of the index-wheel so that it shall not move too freely. C' is also a spring arranged for a similar purpose. The wheels thus restrained will not act with so much freedom as to produce confusion by their revolving too easily.

What I claim as my improvement, and desire to secure by Letters Patent, is—

1. The short platform B, when so arranged in relation to the weighing-apparatus and car that the scale will be at rest and free when the wheels are not upon the platform, and so operating that each end of a car will

be weighted and registered automatically while in motion over the platform, substantially as and for the purpose set forth.

2. The series of counter-weights I and lifting-shaft J, in combination with the beam D, substantially as and for the purpose set forth.

3. The lifting-shaft J, slide and block N, in combination with the loops a and b , arranged and operating substantially as and for the purpose set forth.

4. The index-wheels H G and lug-wheel I, in combination with the cheek or lock A' arranged in relation to each other, and operating substantially as and for the purpose set forth.

5. The loops a' b , in combination with the index-wheels G H, slide-block N, and lifting-shaft J, substantially as and for the purpose set forth.

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Witnesses:

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