

(No Model.)

A. A. ARMITAGE.

COMBINED HAND TRUCK AND WEIGHING SCALE.

No. 366,753.

Patented July 19, 1887.

Fig. 1.

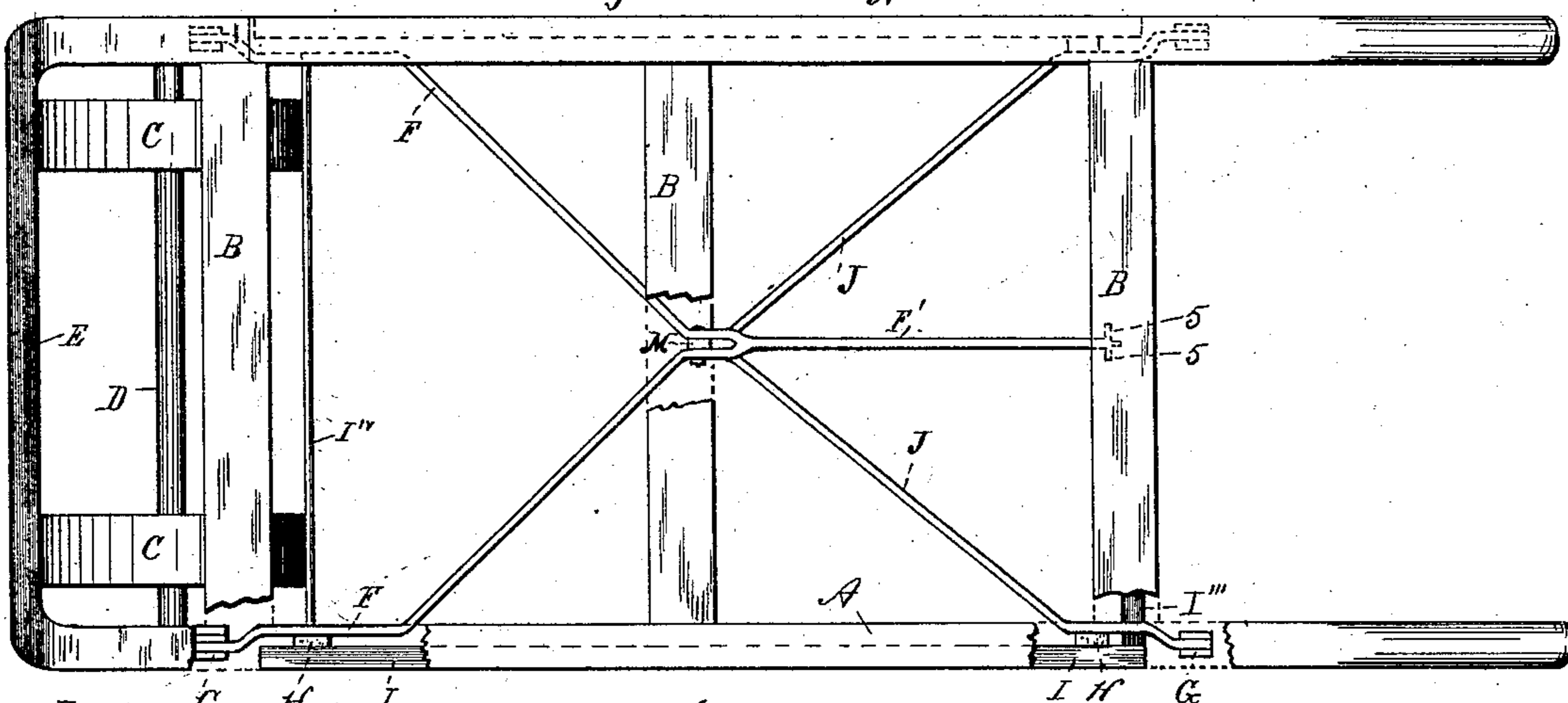


Fig. 2.

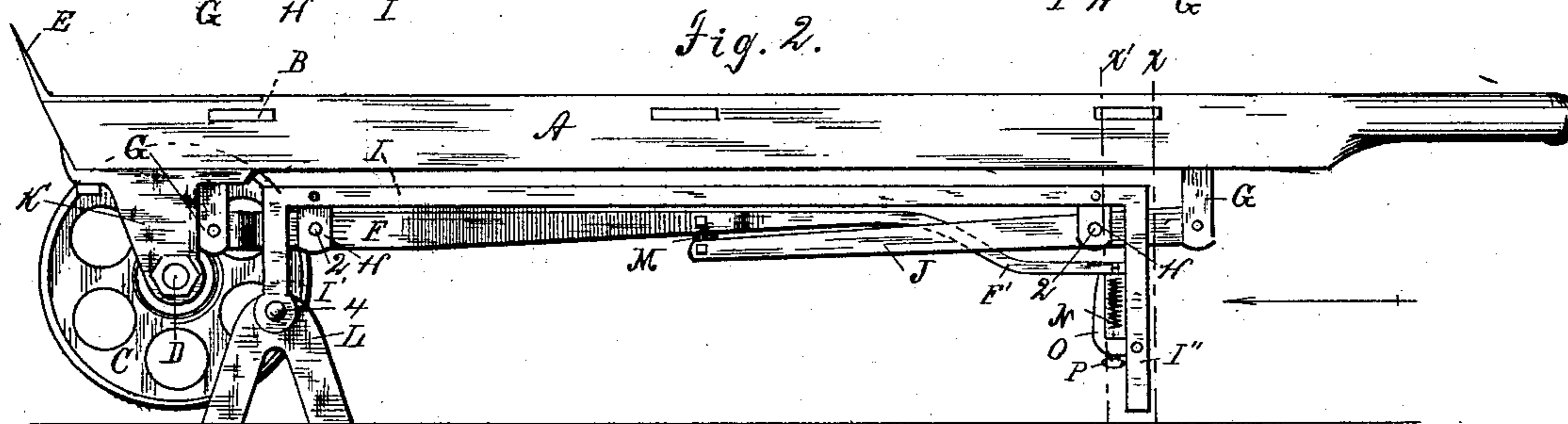


Fig. 3.

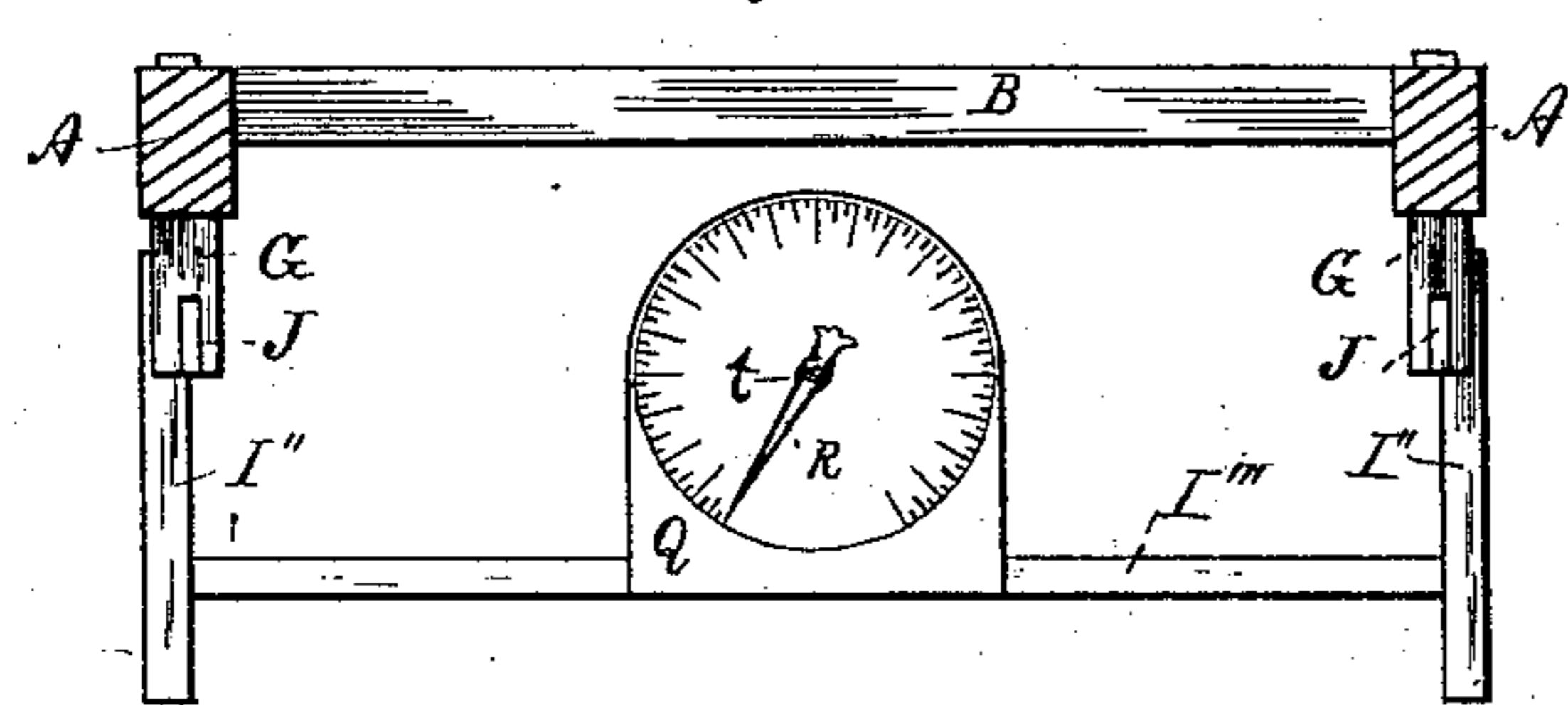


Fig. 5.

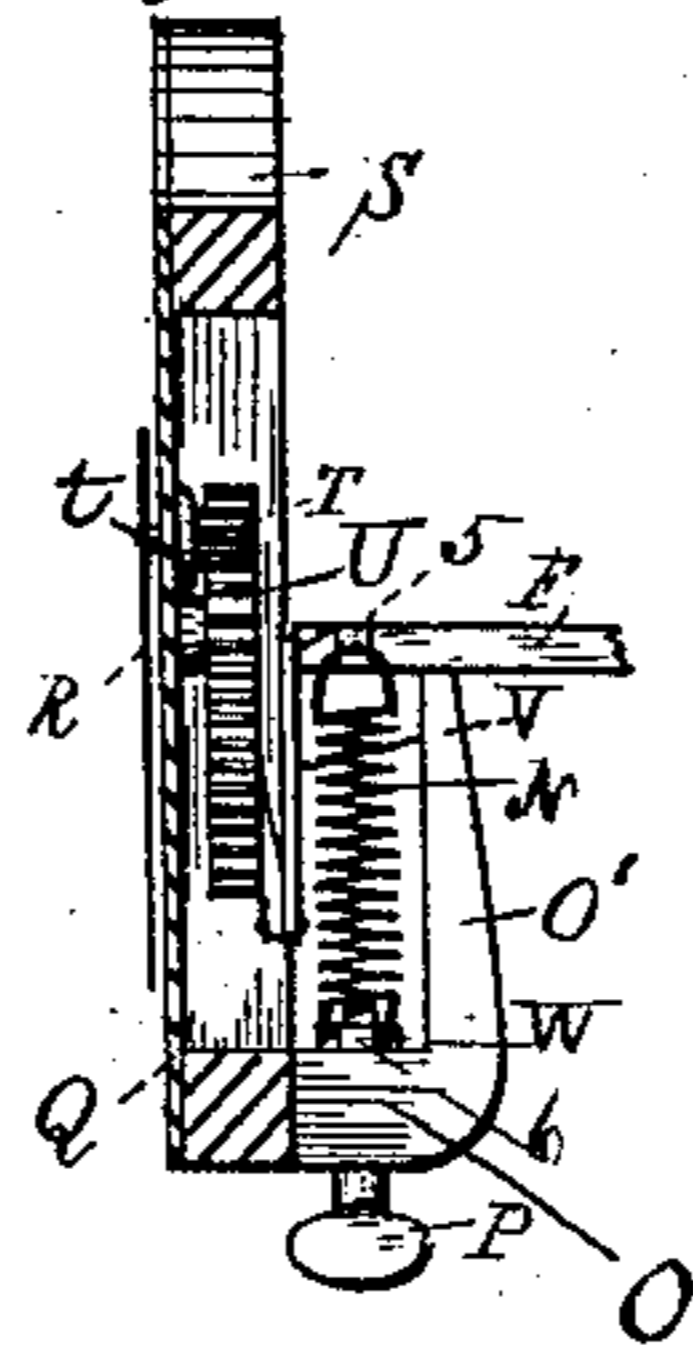
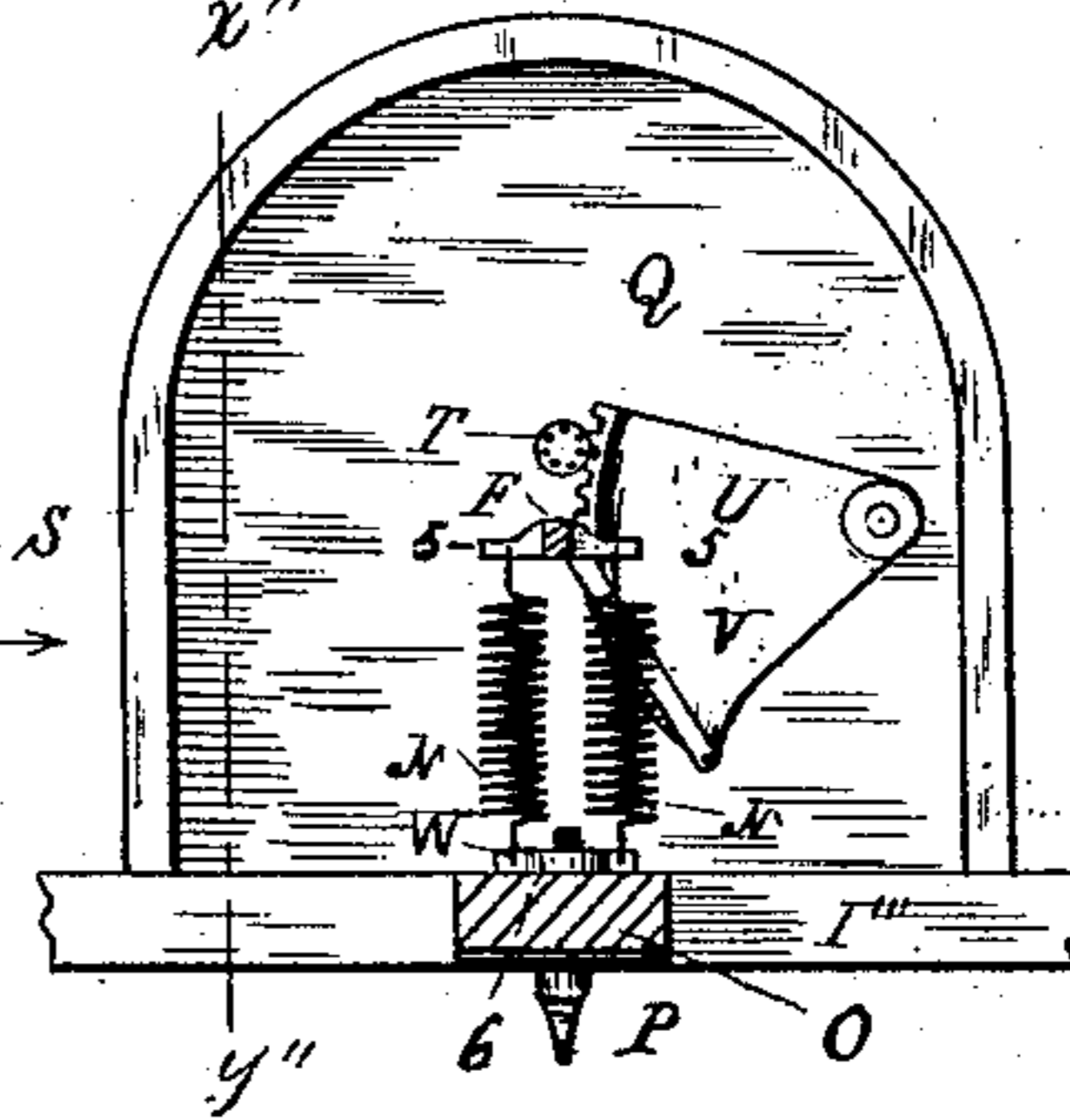


Fig. 4.



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# UNITED STATES PATENT OFFICE.

ALBERT A. ARMITAGE, OF KENESAW, NEBRASKA.

## COMBINED HAND-TRUCK AND WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 366,753, dated July 19, 1887.

Application filed December 22, 1886. Serial No. 222,275. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT A. ARMITAGE, a resident of Kenesaw, in the county of Adams and State of Nebraska, have invented certain new and useful Improvements in Combined Hand-Truck and Scale; 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 pertains to make and use the same.

My invention relates to the combination of a weighing scale and a truck or other wheeled vehicle for the transportation of merchandise or other material. By its use the weight of the load placed upon the vehicle may be known either at all times or whenever by bringing the weighing devices into proper relation with the vehicle they are made to support the load.

The accompanying drawings show the invention in a form adapted for use as an ordinary hand-truck; but it is perhaps equally useful in other forms.

As shown, Figure 1 is a plan of the combined scale and truck, certain of the parts being removed or broken away to show construction; Fig. 2, an elevation of the same; Fig. 3, a view in the direction of the arrow in Fig. 2, parts on the left of the plane  $xy$  being removed; Fig. 4, an enlarged view in a contrary direction, parts on the left of the plane  $x'y'$  being removed; and Fig. 5 is a vertical section through the line  $x''y''$ , Fig. 4, the view being in the direction indicated by the arrow in Fig. 4.

In the drawings, A A B B are the timbers of the bed or frame of a truck. C C are wheels mounted upon the shaft D, and which normally support a portion of the weight of the truck and its load when in use. Upon the lower side of the frame and rigidly attached thereto, are four clips, G G, placed symmetrically with reference to a point, M, near the middle of the truck. The ends of four levers, F F J J, are pivotally suspended in the respective clips. "Knife-edges" or scale-fulcrums 2 2 are fixed in the respective levers at points also symmetrical with respect to the point M, and which are at equal distances from the clip-pivots. The levers F F J J run parallel to the members A A for a short distance, and are then each bent inward toward the point M, near which F F unite to form a single arm,

F', extending beneath the frame toward the rear end of the truck. At M is a vertical link-bar perforated for the passage of two pivots, which unite, respectively, the levers F F and the inferior levers J J.

On each side of the truck, a little below and parallel to the bar A, is a bar, I, having its ends bent downward to form legs I<sup>I</sup> I<sup>II</sup>. These bars are connected rigidly at their rear ends by a cross-bar, I<sup>III</sup>, Figs. 1 and 3, and near their front ends by a rod, I<sup>IV</sup>, to form a practically rigid rectangular frame having four legs. The distance between the bars I I is a little greater than the distance between the external faces of the levers F F and J J at the points where the knife-edges 2 are fixed. In the same vertical plane with the knife-edges pivots are fixed in the inner faces of the bars I I, and these pivots support steel link-bars H, which extend downward and are perforated at the proper points for the passage of the knife-edges or fulcrums 2.

The legs I<sup>I</sup> are shorter than the legs I<sup>II</sup>, and are connected with arches or segments L by pivots 4, which permit the arches to oscillate with reference to the legs I<sup>I</sup>. When the leg I<sup>I</sup> is perpendicular to the base-line of the arch L, the entire height of the leg I<sup>I</sup>, L is equal to or a little greater than the length of the leg I<sup>II</sup>, and this length is such that when the four legs rest upon the same plane the wheels C are slightly raised from that plane. Now, the pivot 4 being some distance in the rear of the pivot or shaft D, it is plain that if the handles of the truck be raised the whole apparatus will oscillate about the pivots 4 until the wheels strike the plane upon which the arch L rests, and that further raising of the handles will lift the arch L from the plane, when the truck may be wheeled or pushed about precisely as if without unusual construction or attachments. The base-line of the arch L always remains horizontal when raised, since its weight is symmetrically distributed, and it swings freely upon the pivot 4. By this construction I get a broad base for the leg I<sup>I</sup> without diminishing the clearance when the leg is raised, as described.

Motion of the arm F' is indicated by an arm or pointer, R, Figs. 3 and 5, which passes over a scale upon a plate, Q, upon the cross-bar I<sup>III</sup>.

The mechanism for connecting the arm F' and the index R is shown in Figs. 4 and 5. The shaft t, upon which the index is fixed, bears upon its other end a rigidly-attached gear, T, with a larger segmental gear, U, mounted upon the plate Q, meshing with it. A link, V, joins the gear U and the end of the lever F'.

On the front face of the cross-bar I<sup>III</sup> is integrally formed or rigidly fastened a horizontal arm, O, having a vertical extension, O', whose upper end forms a stop to limit the downward motion of the arm F'. A thumb-screw, P, passes upward through the arm O, its free end engaging a nut, 6, lying above the arm and provided with wings W, and springs N connect the wings W of the nut with pins 5, formed on the free end of the arm F'. These springs resist the upward motion of the free end of the arm F' with a force which may be adjusted by turning the screw P, and thus raising or lowering the nut 6.

In operation, if while the four legs of the truck rest upon a plane weight be placed upon the truck, the clip-pivots at G depress the shorter arm of each of the levers F F' J J, and by the oscillation of the levers upon the fulcrums 2 the four inner or longer arms are raised together with the arm F', and the springs N are extended to a distance depending upon the amount of the weight upon the truck. At the same time the lever F', by means of the link V and gears U T, rotates the index R a corresponding amount, and if the scale be properly constructed the weight is correctly indicated. If while the truck rests upon its wheels C weight be placed upon the truck, its weight may be ascertained by bringing the truck to a horizontal position.

An important advantage in having the weighing apparatus free from all weight resting upon the truck when the handles are raised is that the strain and wear consequent on wheeling heavy loads is thus avoided.

Many of the parts of the devices employed in the truck illustrated may be modified without deviating from the principles followed in this construction. The means for transmitting the motion of the arm F' to the index R may be replaced by one of the many well-known devices, and the same result will be obtained; but I prefer the construction shown.

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

1. In a combined truck and scale, the com-

bination, with suitable supports, of a weighing and indicating device attached to and resting on said supports, a platform resting upon said weighing device and provided with handles at one end, and a wheel journaled to the platform at the end opposite said handles and adapted to be depressed below the base of said supports when the handles are sufficiently raised, and thus to relieve said supports and said weighing device of the weight of the platform and of any load placed thereon, substantially as and for the purpose set forth.

2. A hand-truck adapted to transmit the weight of its load through the ordinary handles and wheels when the handles are raised for wheeling the load, in combination with an automatically-indicating weighing-scale attached to the truck and adapted to support and indicate the weight of the load whenever the handles are lowered to the position of rest.

3. A hand-truck platform bearing a weighing-scale beneath its surface, and provided with wheels which lie in front of said scale, and which, with the handles, bear the entire weight of the truck, its load and the scale, when the handles are raised, but which are themselves raised by lowering the handles, the scale-supports acting as a fulcrum, substantially as set forth.

4. The combination of a hand-truck, a scale-frame lying below the truck-platform and having suitable supports to rest upon the ground, a series of scale-levers pivotally joined to the truck-platform and pivotally swung in said frame, and means whereby the displacement of said levers may be resisted by a spring and its amount indicated at a convenient point upon the apparatus.

5. The combination of the truck A B C, scale-levers F F' J J, and bar F', connected substantially as described, frame I I<sup>III</sup> I<sup>IV</sup>, supporting said levers, and itself supported by legs I<sup>II</sup>, and jointed fulcrum-legs I<sup>I</sup> L, the bar F', the spring resisting the upward motion of the free end of said arm, and the index actuated by said motion, substantially as and for the purpose set forth.

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

ALBERT A. ARMITAGE.

Witnesses:

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