(No Model.)

E. REISERT.

AUTOMATIC BEAM SCALES FOR FLUIDS.

No. 250,840. Patented Dec. 13 1881.

Fig. 3.

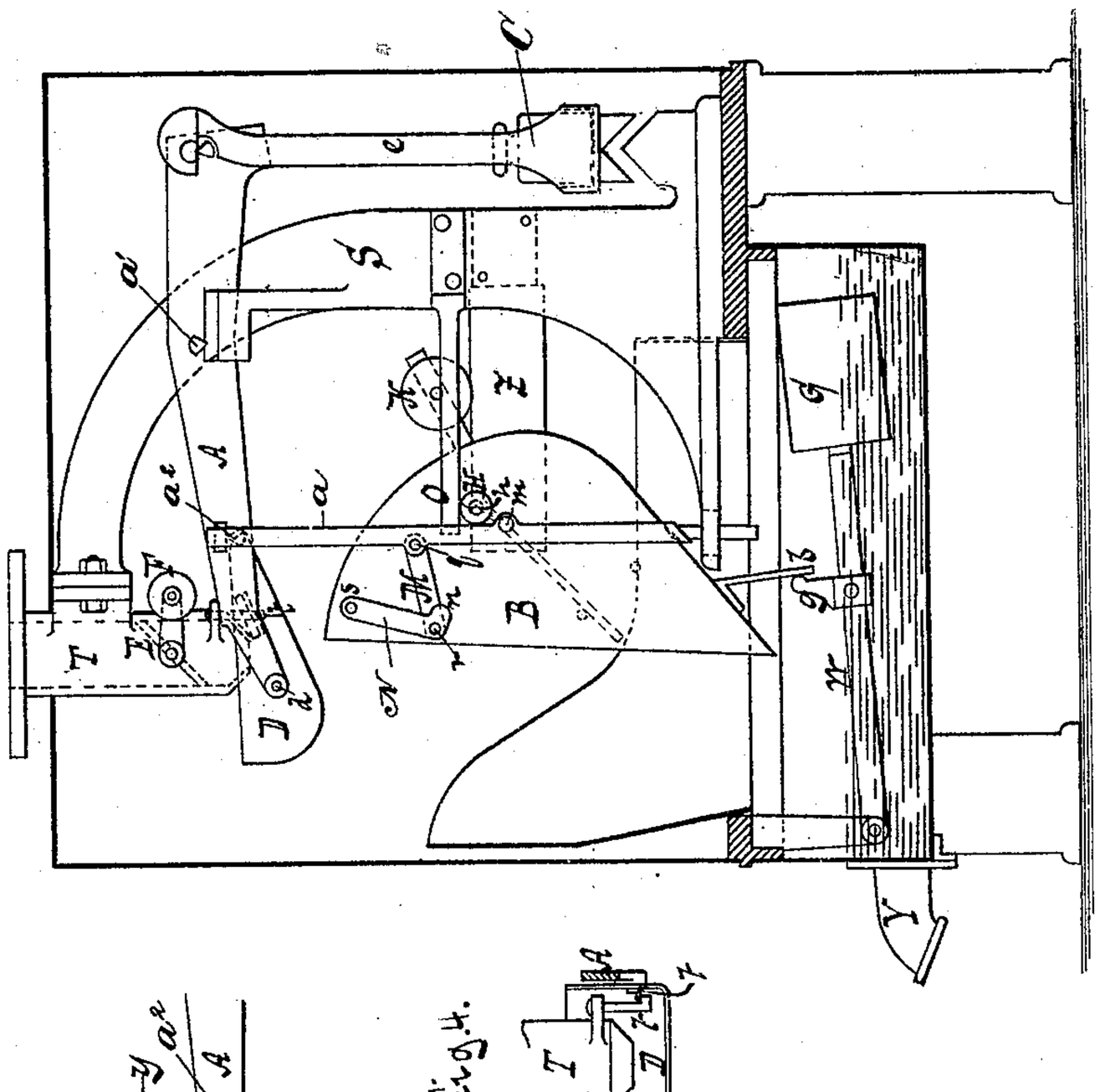


Fig. 2.

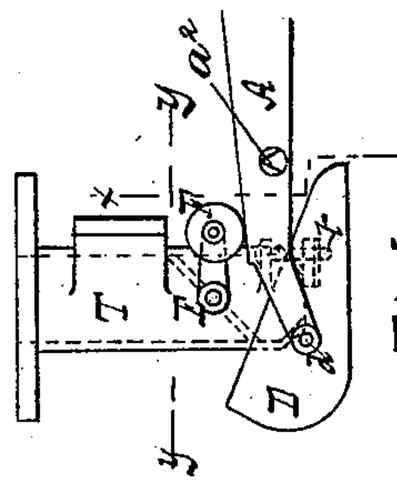


Fig. 5.

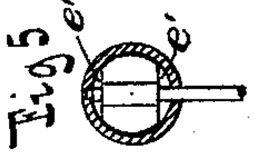


Fig. 4.

Fig. 6.

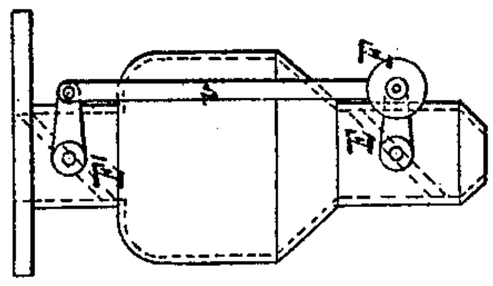
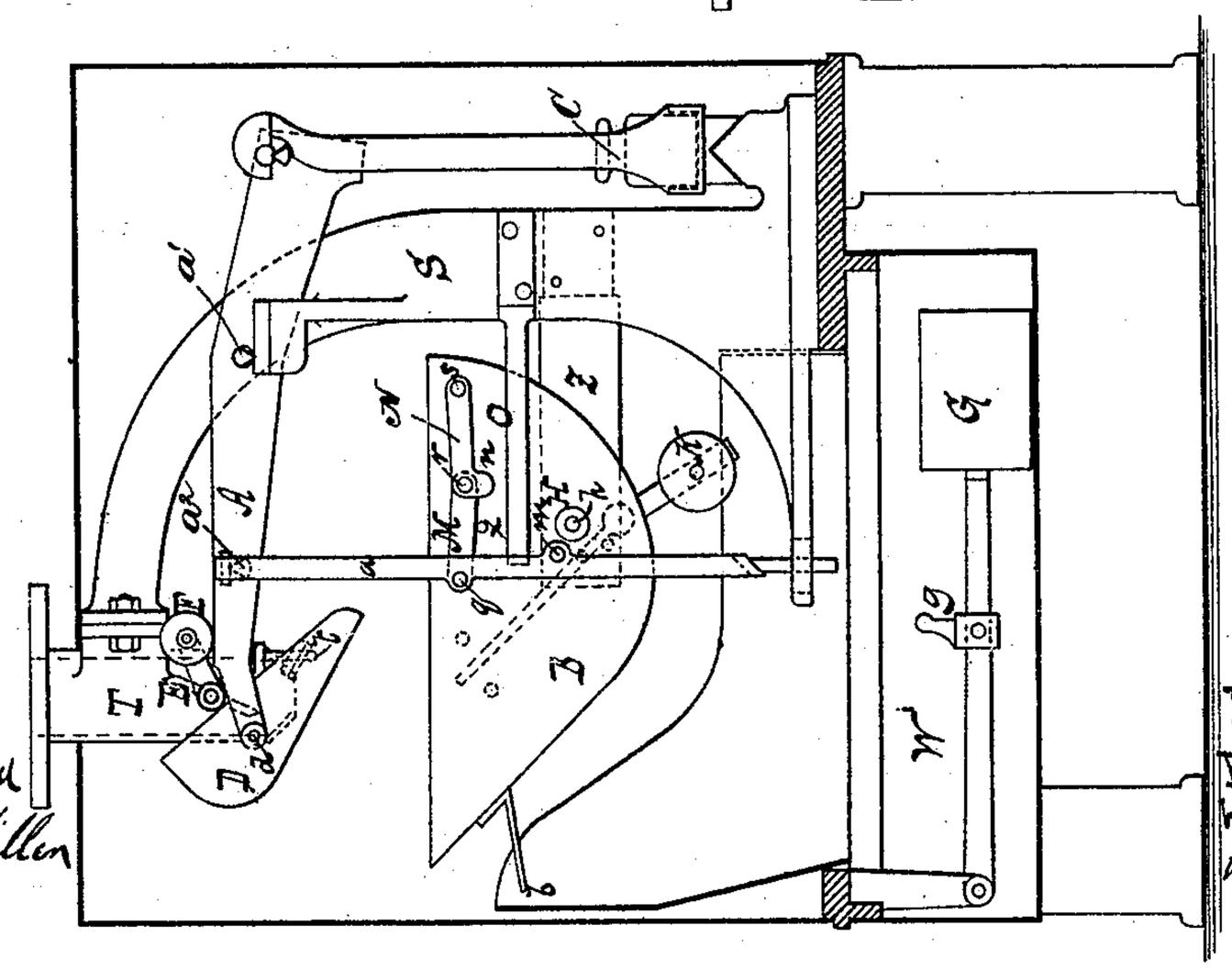


Fig. 1.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC BEAM-SCALE FOR FLUIDS.

SPECIFICATION forming part of Letters Patent No. 250,840, dated December 13, 1881.

Application filed June 21, 1881. (No model.) Patented in Germany June 10, 1879, and June 18, 1880.

To all whom it may concern:

Be it known that I, EDWARD REISERT, a subject of the King of Prussia, residing at Cologne, in the Kingdom of Prussia and Empire of Germany, have invented new and useful Improvements in Automatic Beam-Scales for Fluids, of which the following is a specification.

This invention consists in the combination, with the scale-pan, with the liquid-supply pipe, and with the current-adjusting mechanism, of an intermediate pan which adjusts itself automatically, so as to allow the liquid to pass into the scale-pan until the latter is filled to the required level, and to retain the liquid passing down through the liquid-supply pipe during the time the scale-pan empties; further, in the combination, with the scale-pan and the liquid-supply pipe, of two valves, one above the other, and mechanism for automatically adjusting said valves, whereby the apparatus is adapted for weighing liquids under pressure.

This invention is illustrated in the accompanying drawings, in which Figure 1 represents a side view, partly in section, when the supply-valve is wide open and the scale-pan in position to receive the liquid. Fig. 2 is a similar view of a portion of my weighing apparatus when the supply-valve is partly closed. Fig. 3 is a similar view of my weighing apparatus when the scale-pan is in its discharging position. Fig. 4 is a transverse vertical section in the plane *x x*, Fig. 2. Fig. 5 is a horizontal section in the plane *y y*, Fig. 2. Fig. 6 is a side view of a modification of the liquid-supply tube.

Similar letters indicate corresponding parts.

In these drawings, the letter A designates a scale-beam, which is fork-shaped and has its fulcrum on knife-edges a'.

The letter C indicates the tray for receiving the weights; and the letter B designates the scale-pan, which is suspended by means of rods or bars *a*, (one only being necessary to illustrate,) said bars being hung on knife-edges a^2 on the scale-beam.

D indicates a pan suspended from the end of the scale-beam, and arranged above the scale-pan B and immediately beneath the supply-pipe T.

The liquid to be weighed flows down through the pipe T into the intermediate pan, D, and from this into the scale-pan B.

In the feed-pipe T is situated a throttle-valve, E, of any ordinary construction. If this valve is fully open, as shown in Fig. 1, the liquid flows down in a thick stream and the scale-pan B is filled rapidly; but as soon as the scale-pan begins to sink down the throttle-valve closes, allowing the liquid to pass down in a fine stream through the openings $e' e'$, Fig. 5, which are formed in or on the sides of said valve. This fine stream raises the charge of the scale-pan to correspond to the exact weight in the tray C, and as soon as this exact weight has been reached the intermediate pan, D, assumes the position shown in Fig. 3, and serves to catch the liquid passing down through the openings *e e*, while the scale pan B assumes the position shown in Fig. 3, so as to discharge its contents into the reservoir W. In this reservoir is situated a float, G, which is raised by the liquid discharging from the scale-pan B, so that the arm *b* of the scale-pan catches behind the nose *g* on the lever of the float, and the scale-pan is retained in position until, by the discharge of the liquid through the spout Y, the float in the reservoir W sinks down and the nose *g* releases the arm *b*, when the scale-pan B returns to its normal position.

If desired to register the successive weighing operations, a registering mechanism of any ordinary construction may be arranged in the position shown at Z; but, as such forms no part of my invention, it is not deemed necessary to here illustrate the same.

If the scale-pan B is empty, the scale-beam is depressed by the weight in the tray C, and its front end presses against the roller F secured to the throttle-valve E, and by these means this valve is held wide open, as shown in Fig. 1.

The intermediate pan, D, is suspended from the scale-beam A by means of two fine studs, *d*, which are so situated that the inner or discharge end of said pan overbalances the outer end, and this discharge end is supported by two hooks, *t*, which are secured to the feed-pipe T and catch beneath stops t', fastened to the inner surface of the pan, Fig. 4. When the scale-beam is in the position shown in Fig. 1 the intermediate pan, D, is thrown in a downwardly-

inclined position, as shown in the same figure, and the liquid flows in a thick stream into the scale-pan B. When this scale-pan has become partly filled the scale-beam moves to the position shown in Fig. 2, the roller F closes the throttle-valve E, and at the same time this roller ceases to press upon the scale-beam, and consequently an additional quantity of liquid must flow into the scale-pan in order to cause a further movement of the scale-beam. The throttle-valve has closed the feed-pipe, allowing the liquid to pass through the openings *e' e'* in a fine stream. By the downward movement of the outer end of the scale-beam the intermediate pan, D, is brought into the position shown in Fig. 2. Since the stops *t'* move downward, while the hooks *t*, Fig. 4, remain stationary, the bottom of the pan D is in a horizontal position, and the liquid, passing down through the openings *e e*, trickles slowly into the scale-pan B and raises the weight of the contents in said scale-pan to the exact weight of the weight in the tray C. As soon as this has been accomplished the scale-beam makes a further movement, and the entire mechanism assumes the position shown in Fig. 3. The bottom of the intermediate pan, D, is brought in an upwardly-inclined position, and the liquid, passing down through the openings *e e*, accumulates in said pan, while the scale-pan B is tipped up so as to discharge its contents into the reservoir W.

The scale-pan B is supported by two pivots, *m*, which swivel in rods *a*, suspended from knife-edge bearings fastened in the scale-beam.

On the scale-pan is secured a weight, K, and if the pan is empty its center of gravity is on the right-hand side of the pivots *m*, Figs. 1 and 3; but if said pan is filled with liquid the center of gravity of the entire mass (the pan, the liquid contained therein, and the weight K) is situated on the left hand of the pivots *m*. When the scale-pan B is empty, therefore, it has a tendency to turn toward the right as far as the toggle-levers M N permit, Fig. 1. When the scale-pan is filled it has a tendency to turn toward the left; but it is prevented from doing so by the toggle-joint *q r s'* until the weight of the liquid causes the scale-pan to sink down.

The pivot *q* is secured in the rod *a*, the pivot *s* on the pan B, and the pivot *r* connects the two levers M N. If a right line is drawn through the centers of the pivots *q s*, the pivot *r* is situated beneath this line. In order to prevent this pivot from descending any farther, a stop, *x*, is secured in the pan B. When a sufficient quantity of liquid has flown into the pan said pan sinks down and the nose N of the toggle-lever N strikes a rod, O, extending from the standard S, the pivot *r* is forced upward, and the pan B is permitted to tip up and to discharge its contents. The mechanism assumes the position shown in Fig. 3. As the liquid discharges from scale-pan B the weight K has a tendency to turn said pan back to its normal position; and, furthermore, the scale-beam has a tendency to return to the position shown in Fig. 1. At the moment the pan B discharges its contents into the reservoir W the float G rises and the pan B is retained in the position shown in Fig. 4, as already explained, until the liquid has time to discharge through the spout Y, and since this requires several seconds the liquid from the pan B has time to discharge. As soon as the float G descends the scale-pan turns back to its normal position, the front end of the scale-beam rises, and as it strikes the roller F the throttle-valve E is thrown wide open, which, however, must not be done before the pan B has reassumed its normal position. For this reason a roller, H, is secured to this pan, which turns on the pivot *h*. In the position shown in Fig. 3 this roller bears against the rod O, and allows the scale-beam to return to the position shown in Fig. 1 only after the pan B has assumed its normal position. The toggle-levers M N also return to the position shown in Fig. 1, being caused to descend by their own gravity until the lever M strikes the stop *x*. At the same time the intermediate pan, D, is also brought back to the position shown in Fig. 1, and the liquid which has accumulated in this intermediate pan is discharged into the scale-pan B. At the same time the full stream of liquid, passing down through the feed-pipe T, flows into the pan B, the valve E being wide open.

In case my apparatus is to be used for weighing liquids which are conducted to it under pressure, a second throttle-valve, E', is arranged in the feed-pipe T above the valve E, the two valves being connected by a rod, *v*, as shown in Fig. 6. The valve E', when closed, completely shuts off the liquid under pressure, and the space between the two valves forms a reservoir, from which the liquid contained therein passes through the openings *e e* in the valve E, without pressure, in a fine stream over the intermediate pan, D, into the scale-pan B. By these means the pressure of the liquid is prevented from influencing the correctness of the weighing operation.

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

1. The combination, substantially as herein-before described, of the scale-pan, the scale-beam, the stream-adjusting mechanism, and the intermediate self-adjusting pan.

2. The combination, substantially as herein-before described, of the scale-pan, the scale-beam, the liquid-supply pipe, the two valves in the liquid-supply pipe, the reservoir between the two valves, and the mechanism for automatically adjusting said valves.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EDWARD REISERT.

Witnesses:
HERMANN HEYER,
BARTHOLOMÄUS NEUSS.