

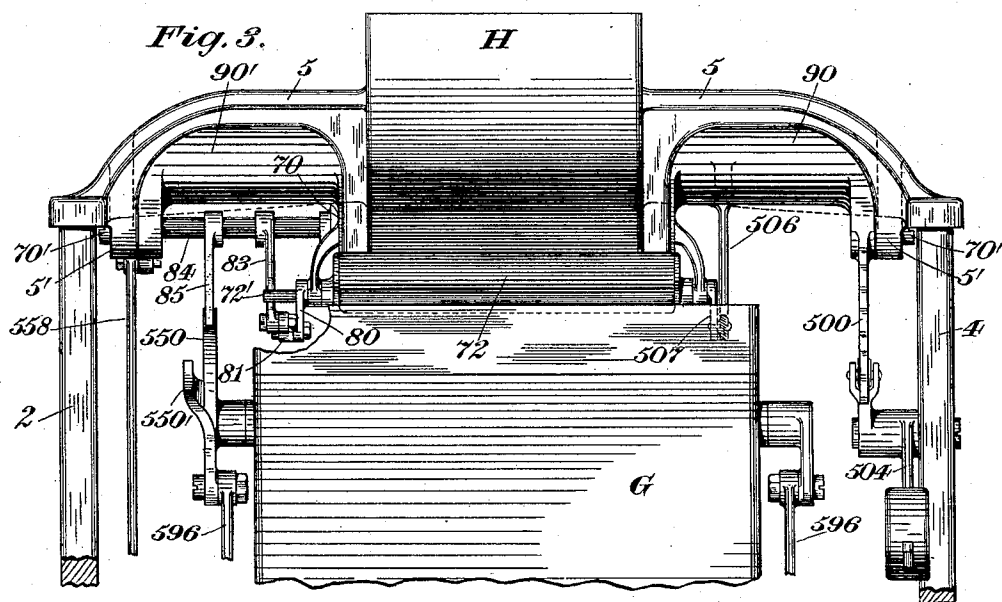
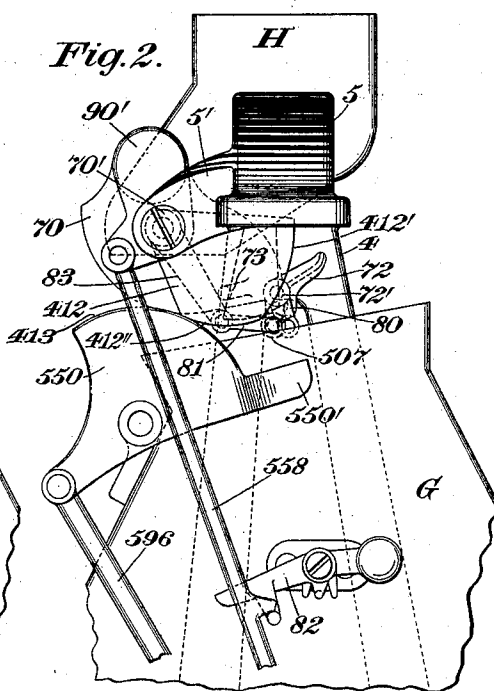
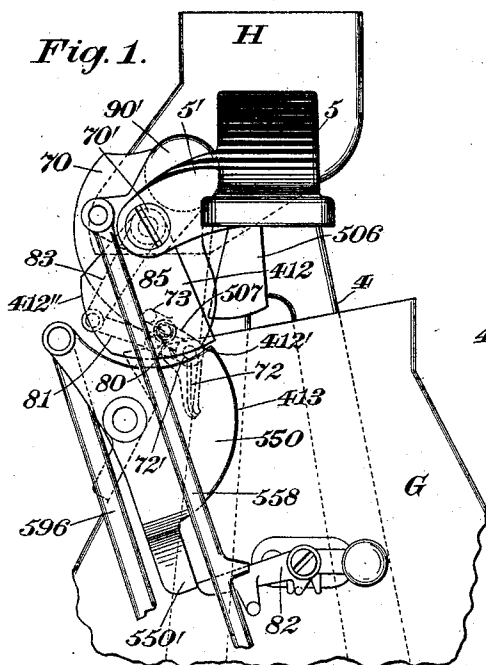
(No Model.)

2 Sheets—Sheet 1.

F. H. RICHARDS.
WEIGHING MACHINE.

No. 568,587.

Patented Sept. 29, 1896.—



Witnesses:
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Fred. J. Dole.

Inventor:
F. H. Richards.

(No Model.)

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Fig. 4.

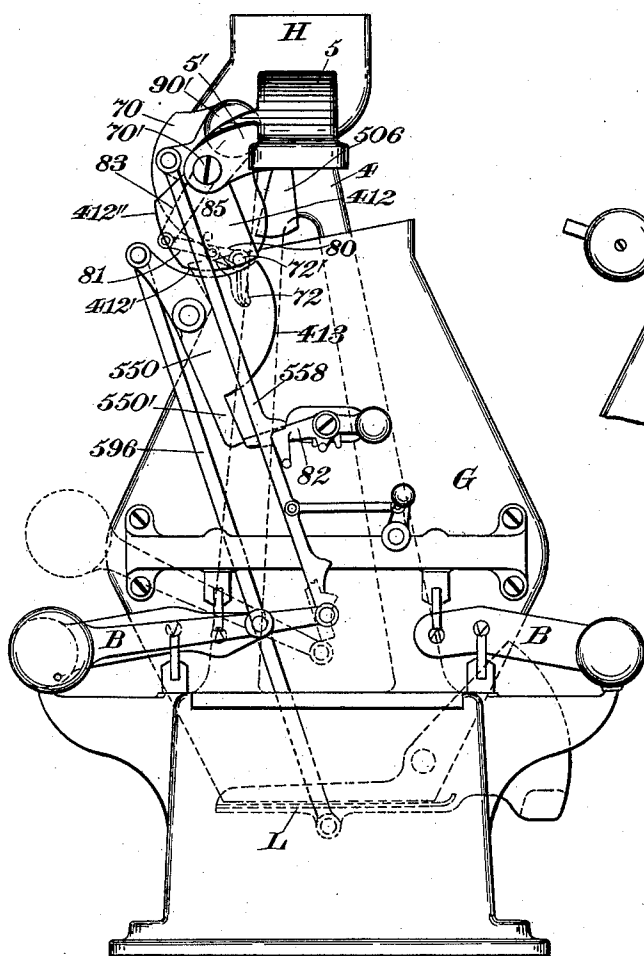
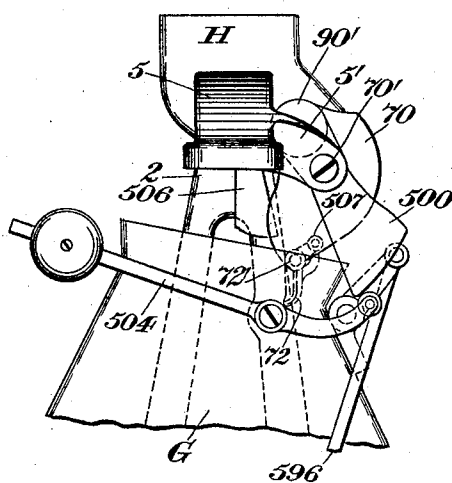


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,587, dated September 29, 1896.

Application filed June 20, 1896. Serial No. 596,291. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Weighing-Machines, of which the following is a specification.

This invention relates to weighing-machines, and particularly to that class of weighing-machines adapted for automatically and continuously weighing out predetermined quantities of grain or other relatively free-flowing materials, and in which two connected valves, one a main valve and the other a supplemental valve carried by the main valve, are provided for controlling the flow of the stream into a bucket or load-receptacle, the object being to provide means for positively locking the supplemental valve against opening when in its closed position and for preventing the release, when the supplemental valve is open, of a member shiftable for discharging the bucket-load.

My present invention is especially designed and intended as an improvement on the weighing-machine described and claimed in my Patent No. 548,840, granted October 29, 1895, and on my other patents, No. 548,850, granted October 29, 1895, and No. 559,208, granted April 26, 1896, the first of which patents shows an automatic weighing-machine of the "single-chambered" type, having interlocking mechanism for positively controlling the movements of a main valve and a shiftable member or closer, and the last two of which represent a supplemental valve carried by a main valve substantially similar to that represented in such first-mentioned patent.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of the upper portion of a weighing-machine embodying my present improvements and representing the valves open and the stop-segment for controlling the discharge of the bucket-load locked to prevent the discharge of the load. Fig. 2 is a similar view showing the valves closed and the locking-segment released and thrown into position for preventing the opening of the valves until the shiftable member or load-

discharger of the bucket mechanism is returned to its normal position. Fig. 3 is a front elevation of the upper portion of said machine. Fig. 4 is a side elevation, on a smaller scale, of a complete machine, the counterweighted valve-actuating lever not being shown; and Fig. 5 is a similar view of the upper portion of the machine, looking from the opposite side thereof.

Similar characters designate like parts in all the figures of the drawings.

My invention embodies, in connection with a shiftable member having a load-discharging movement for permitting the emptying of the load weighed by the machine, a pair of stream-controlling valves, one constituting a main valve and the other a supplemental valve carried by the main valve and having a stream-controlling movement with respect to the main valve, and means operative with the supplemental valve for limiting the movement of the shiftable member while such valve is in its open position, and my invention also contemplates the provision of a pair of mutually-dependent or reciprocally-effective means for preventing the opening of the valves until the shiftable member is in its locked position and for maintaining the shiftable member latched while the supplemental valve is open, said means constituting valve-opening-movement and load-discharging-movement limiters, the former operative with the shiftable member or closer and the latter with the supplemental valve.

Although I have represented my present improvements in connection with a weighing-machine of the type illustrated in the patent first hereinbefore referred to, it will be obvious that they are equally applicable to other forms of automatic weighing apparatus.

In the present instance the framework of the machine comprises two side frames connected at their upper ends by a top plate or beam. These side frames are designated herein by 2 and 4, respectively, and the top plate by 5. This top plate or beam is also represented as carrying the usual supply spout or chute H for controlling the flow of the stream of material into the load-receiver or bucket.

The bucket, which is designated in a gen-

eral way by G, is, as before stated, of the single-chambered type, and is supported under the supply spout or chute for receiving the material flowing therefrom into the valves and thence into the bucket.

The main stream-controlling valve may be of any suitable construction, but is preferably substantially similar to the improved valve described in Letters Patent No. 535,727, granted to me March 12, 1895, and is illustrated herein at 70 as carried for oscillatory movement by arms or brackets 5', depending from the top plate 5, the pivot or axis of movement of the valve being designated by 70'. This valve is shown located substantially below the mouth of the chute II and having its axis of movement passing through the stream of material flowing therefrom, the bottom or pan of the valve being adapted to form alternately a support and a chute for the material issuing from the chute II. The valve is preferably balanced so as to have normally no tendency either to open or close, the balance-weight being shown herein as a shaft 90', extending from opposite ends of the main valve.

For the purpose of actuating the valve to close the same I prefer to employ a counter-weighted valve-actuating lever 504, having an antifriction-roll working against the face of a cam 500, depending from the axis of the valve 70, the construction of these parts being substantially similar to that represented in Patent No. 548,843, granted to me October 29, 1895.

For opening the valve any suitable mechanism may be employed, for instance, that described and claimed in the Letters Patent first hereinbefore referred to, in which a valve-actuating rod—such as 558—is represented as operated by the return of the beam mechanism (herein designated in a general way by B) on the return of the bucket to its normal position after discharging its contents.

As will be obvious by reference to Letters Patent No. 548,850, hereinbefore mentioned, the supplemental valve, which is illustrated at 72, is operative for controlling the drip-stream supplied to the bucket after the principal portion of the load has been made up by the material passing through the main valve 70. This supplemental valve is shown herein carried at the forward or discharge edge of the main valve for oscillation thereon relatively thereto, and is also represented having connected thereto in the rear of its axis of movement 72' a link 81, secured to a rock-arm 80, fixed on the shaft 72', which forms the axis of movement of the valve 72. This link is, in turn, illustrated pivotally connected with the free end of a rock-arm 83, secured to a loosely-mounted rock-shaft 84, carried concentric with the axis of the main valve 70, the left-hand end of said rock-shaft being represented in the drawings mounted in the journaled end of the left-hand trun-

nion or stud, which forms the center of support for the main valve at one end thereof, while the opposite end of said rock-shaft is illustrated carried in a corresponding journal-opening in one side wall of the main valve. A second rock-arm is shown at 85, secured to the rock-shaft 84, this arm being in the nature of a cam constituting a stop or load-discharging-movement limiter 412, operative with the supplemental valve and adapted to cooperate with a corresponding stop or rocker 550, controlling the release of the shiftable member or load-discharger L.

The rocker 550 is substantially similar to that illustrated in my Patent No. 548,840, it being pivotally connected with a connecting-rod 596 for holding the bucket discharger or closer locked, and this rocker has a locking-face 413, cooperative with the faces 412' and 412'' of the stop 412 and constitutes a valve-opening-movement limiter for preventing the opening movement of the supplemental valve and of the main valve when the parts are in the positions shown in Fig. 2.

The rocker 550 is represented having the usual detent 550', adapted to be engaged by a latch 82 when the closer is shut and the valves are open, the construction and operation of all of these devices being well understood. Moreover, a stop is represented provided at 73 on the main valve for limiting the throw of the supplemental valve in closing, and the operation of this stop will also be obvious.

From the construction of the valve mechanism and the interlocking stops hereinbefore described it will be apparent that when both of the valves are open and in the position shown in Figs 1 and 4 the rocker 550 will be prevented from turning by the abutment of the stop-face 412' against the end of the rocker-face 413, and that when the load is nearly made up and the bucket descends the valve-closing actuator 504 will operate through the depending cam 500 to close the main valve in a manner well understood in this art.

Any suitable means—such as the depending cam 506, cooperating with an antifriction-roller at the end of a rock-arm 507, oscillating with the valve 72 and about the axis thereof—may be employed for actuating the supplemental valve to close the same; and for the purpose of insuring the positive movement of this valve to cut off the drip-stream the face 412'' of the stop 412 on the valve 70 is suitably curved, so that when the rocker 550 oscillates it will ride over the cam-face 412'' and throw the supplemental valve positively to the position shown in Fig. 2, the stop 412 and the rock-arm 83 moving about the axis of the main valve and relatively to said valve 70, and said stop 412 serving to lock not only the supplemental valve but also the main valve against opening movements while the rocker is in the position shown in Fig. 2.

It will be apparent that such a combination of devices as that hereinbefore described, and illustrated in the drawings of this application, constitutes a very effective means for interlocking the operations of the supplemental valve and the load-discharger and for rendering the same reciprocally effective during the weighing operation.

Having described my invention, I claim—

1. The combination with a main valve, of a supplemental valve supported on the main valve for movement relatively thereto; valve-actuating means; a shiftable member having a load-discharging movement; and a load-discharging-movement limiter operative with the supplemental valve for limiting the movement of the shiftable member by the non-closing of the supplemental valve.

2. The combination with an oscillatory main valve, of a supplemental valve supported on the main valve for movement relatively thereto; valve-actuating means; a shiftable member having a load-discharging movement; and an oscillatory load-discharging-movement limiter operative with the supplemental valve relatively to the main valve for limiting the movement of the shiftable member by the non-closing of the supplemental valve.

3. The combination with a main valve, of a supplemental valve supported on the main valve for movement relatively thereto; a shiftable member having a load-discharging movement; and reciprocally effective valve-opening-movement and load-discharging-movement limiters, the former operative with

the shiftable member and the latter operative with the supplemental valve.

4. The combination with a main valve, of a supplemental valve supported on the main valve for movement relatively thereto; actuating means for closing the main valve; a shiftable member having a load-discharging movement; and reciprocally-effective valve-opening-movement and load-discharging-movement limiters, the former operative with the shiftable member and the latter operative with the supplemental valve and having means operative by the valve-opening-movement limiter for closing said valve on the release of the shiftable member.

5. The combination with a main valve, of a supplemental valve supported on the main valve for movement relatively thereto; actuating means for closing the main valve; a shiftable member having a load-discharging movement; and reciprocally-effective valve-opening-movement and load-discharging-movement limiters, the former operative with the shiftable member and the latter operative with the supplemental valve and having connections with said valve for closing the same and also having a cam-face in position and adapted to be engaged by the valve-opening-movement limiter on the release of the shiftable member, to thereby actuate the load-discharging-movement limiter and close the supplemental valve.

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