No. 713,099. Patented Nov. 11, 1902.

G. HOEPNER.

FEED REGULATOR.

(Application filed May 7, 1901.)

(No Model.)

Fig. 1.

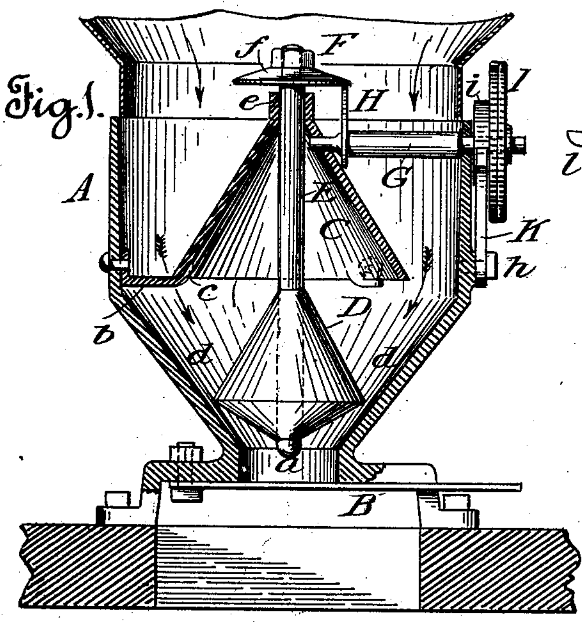


Fig. 2.

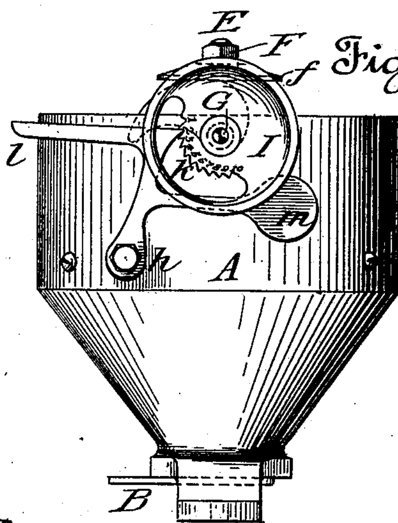


Fig. 3.

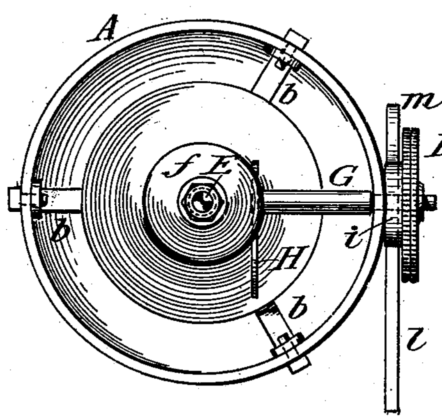
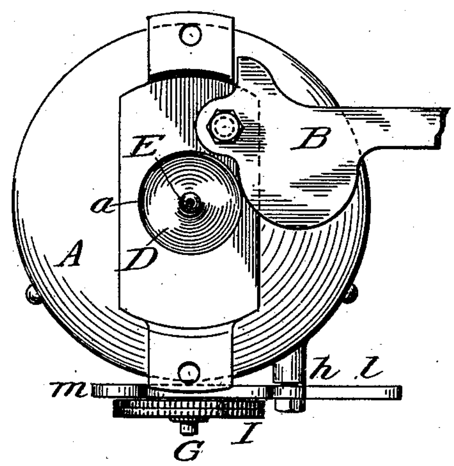


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE HOEPNER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO UNION SCALE AND MANUFACTURING COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

FEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 713,099, dated November 11, 1902.

Application filed May 7, 1901. Serial No. 59,147. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HOEPNER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Feed-Regulators, of which the following is a specification.

My invention relates to the feeding of dry materials—such as grain, coffee, spices, flour, and other cereals—in regulated quantities.

My object is to obtain an exact control of the material, so that it will be discharged in a steady uniform stream, and also to secure a fine and accurate adjustment of the regulating devices, so that the amount of the flow can be varied, remaining constant and uniform at any adjustment of such devices.

My invention is adapted to many situations in which a regulated feed is required, and is particularly fitted for use in automatic weighing devices, wherein the rate of the feed is of importance with relation to the accuracy of the weighing.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the discharging end of a feed-hopper. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan. Fig. 4 is a bottom plan.

A represents the lower or discharge end of a hopper, the upper part of which is shown as broken away and may be of any desired size and capacity. The hopper-bottom converges to an outlet *a*, which is opened or closed by a cut-off B.

Above the converging bottom the hopper-wall is preferably perpendicular, and the cross-section of the part A at any plane is preferably circular. Mounted centrally within the part A and suitably supported, as by the brackets *b*, is a hollow cone C, the base of which is open toward the hopper-outlet. The brackets *b* are shown as provided with upturned ends *c*, which take under the edge of the cone at several points, and so center the cone and hold it firmly, but so that it can be easily removed. The material supplied from the mass above is spread evenly by this cone and falls between its base and the hopper-wall against the converging bottom, and so reaches the outlet. The size of the stream and quantity of the material carried by it are controlled and regulated by the cone D. This cone may be either a single or a double cone, the latter being preferred because it affords greater facility for attachment to the rod by which it is supported. This cone is secured to a rod E, which is guided in a bearing *e* in the top of cone C, and has an upper threaded end to receive the nut F, having the circular wing or flange *f*. The latter in the lowest possible position of the cone D would act as a stop against the top of cone C. The range of adjustment permitted the cone D is such that the outlet can be closed by the cone or that a variable circular space *d* can be formed around the cone-base, through which the material is compelled to flow, and as the spreading-cone C has caused a practically even and uniform flow of the material such uniformity is continued in the space just referred to and to and through the outlet. In order that the quantity of material and size of the flow may be varied according to the character of such material or to other circumstances, a fine and accurate adjustment of the cone D is provided, whereby the width of the space *d* is increased or diminished, enlarging or reducing the size of the stream, but preserving its uniformity. Entering the hopper A at about the plane of the top of cone C is a shaft G, whose bearings are holes in the hopper and cone. Near the inner end of the shaft is secured a cam H, the edge of which bears below and against the flange *f* and supports it. On the other end of the shaft and outside the hopper is a hand-wheel I, having a boss *i*, provided with an arc of teeth *k*. By turning the hand-wheel in one direction the cam raises the flange *f* and lifts cone D toward or into cone C, so as to enlarge the space *d*, while its motion in the other direction permits the cone to follow the cam down, and so reduce the space. Accuracy and definiteness in adjustment are secured by means of a pawl K, pivoted at *h* to the hopper and having a handle *l* and a weight *m*. This pawl engages the arc *k* and is held in engagement by the weight, thus locking the adjusting device at any desired point.

When the pawl is disengaged, the cone descends by gravity, aided to some extent by any material in the hopper, and is locked at the proper point by the pawl. The arc therefore acts as a gage or scale and may be appropriately marked, as shown, to indicate changes in the stream to which the spacing of the teeth bears a definite relation. Thus, for instance, the drawings show the pawl in the space marked "2," which might indicate that at that adjustment one pound of some particular material will be fed in one second. This would not be true of some other material; but the position of the pawl on the scale which will make it true of such other material will be known. Hence an unskilled operator can manage the adjustment under instructions to run the feed at a definite point on the scale. Adjustment by the hand-wheel alone, which might not be exact, is thus controlled and rendered certain.

By securing the bottom of the spreader at a distance above the lower or contracted portion of the hopper, which virtually forms a valve-seat when the cone is lowered into contact therewith, and by locating the shaft for operating the cone above the bottom of the spreader a perfectly free and unobstructed passage is secured for the material between the cone and the hopper at all adjustments and especially when it is desired to close the hopper by lowering the cone.

I do not limit myself to details of construction herein described, and shown in the drawings, as I desire to avail myself of such modifications and equivalents as fall properly within the spirit of my invention.

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

1. In a feed-regulator, a hopper provided with a valve-seat, a spreader therein supported at a distance above said seat, a vertically-movable valve suspended axially below the spreader, a shaft through the hopper, the inner end of which is supported by the spreader above the valve-seat and provided with means for moving the valve, and means on the outer end of the shaft for holding it rigidly in the desired position of rotation.

2. In a feed-regulator, a hopper provided with a conical valve-seat, a conical spreader therein supported at a distance above said seat, a valve below the spreader, a shaft through the hopper, the inner end of which is journaled in the spreader near its apex, and is provided with means for moving the valve, and the outer end is provided with means for holding it rigidly in the desired position of rotation, the said valve being arranged axially below the conical spreader.

3. In a feed-regulator, a hopper provided with a conical valve-seat, a conical spreader therein, the apex of which is perforated vertically, a rod through said perforation, the lower end of which is provided with a valve, a shaft through the hopper, the inner end of which is journaled in the spreader and provided with means for moving the rod and valve vertically and the outer end is provided with means for holding the shaft in the desired position of rotation.

4. In a feed-regulator, a hopper provided with a conical valve-seat, a conical spreader therein the apex of which is perforated vertically, a rod through said perforation, the lower end of which is provided with a conical valve, and the upper end with a shoulder, a shaft through the hopper, the inner end of which is journaled in the cone and provided with means for detachably engaging with the shoulder for moving the rod and valve vertically, and the outer end of the shaft is provided with means for holding it in the desired position of rotation.

5. In a feed-regulator, a hopper provided with a conical valve-seat, a conical spreader therein, the apex of which is perforated vertically, a rod through said perforation, the lower end of which is provided with a conical valve and the upper end with a flange, a shaft through the hopper, the inner end of which is journaled in the spreader, and provided with a cam in position to engage with the flange, the outer end of the shaft being provided with means for holding it in the desired position of rotation.

6. In a feed-regulator, a hopper provided with a conical valve-seat, a conical spreader therein, the apex of which is perforated vertically, a rod through said perforation, the lower end of which is provided with a conical valve, and the upper end with a flange, a shaft through the hopper, the inner end of which is journaled in the spreader and provided with an adjusting-cam in position for engaging with the flange, the outer end of the shaft being provided with means for holding it in the desired position of rotation.

7. In a feed-regulator, a hopper provided with a valve-seat, a spreader therein, a vertically-movable valve below the spreader, a shaft through the hopper, the inner end of which is provided with means for moving the valve, and the outer end with a graduated toothed arc, and a pawl for engaging with the arc, said means and the graduations being so adjusted relatively to each other that the amount of material passing through the hopper will be indicated by the graduations.

8. In a feed-regulator, a hopper provided with a valve-seat, a spreader therein, a vertically-movable valve below the spreader provided with a flange, a shaft through the hopper, the inner end of which is provided with a cam for engaging with the flange, and the other end with a graduated rack, the cam and rack being adjustable relatively to each other, and means for engaging with the rack and locking the shaft against rotation.

9. In a feed-regulator, a hopper provided with a valve-seat, a spreader therein, a vertically-movable valve below the spreader, a shaft through the hopper, the inner end of

which is provided with means for moving the valve, and the outer end with a hand-wheel, said wheel being provided with a toothed arc, and a pawl for engaging with the arc and locking the shaft, said arc and means for moving the valve being adjusted relatively to each other.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 25th day of April, 1901.

GEORGE HOEPNER.

Witnesses:
L. W. SEELY,
W. R. GRANT.