

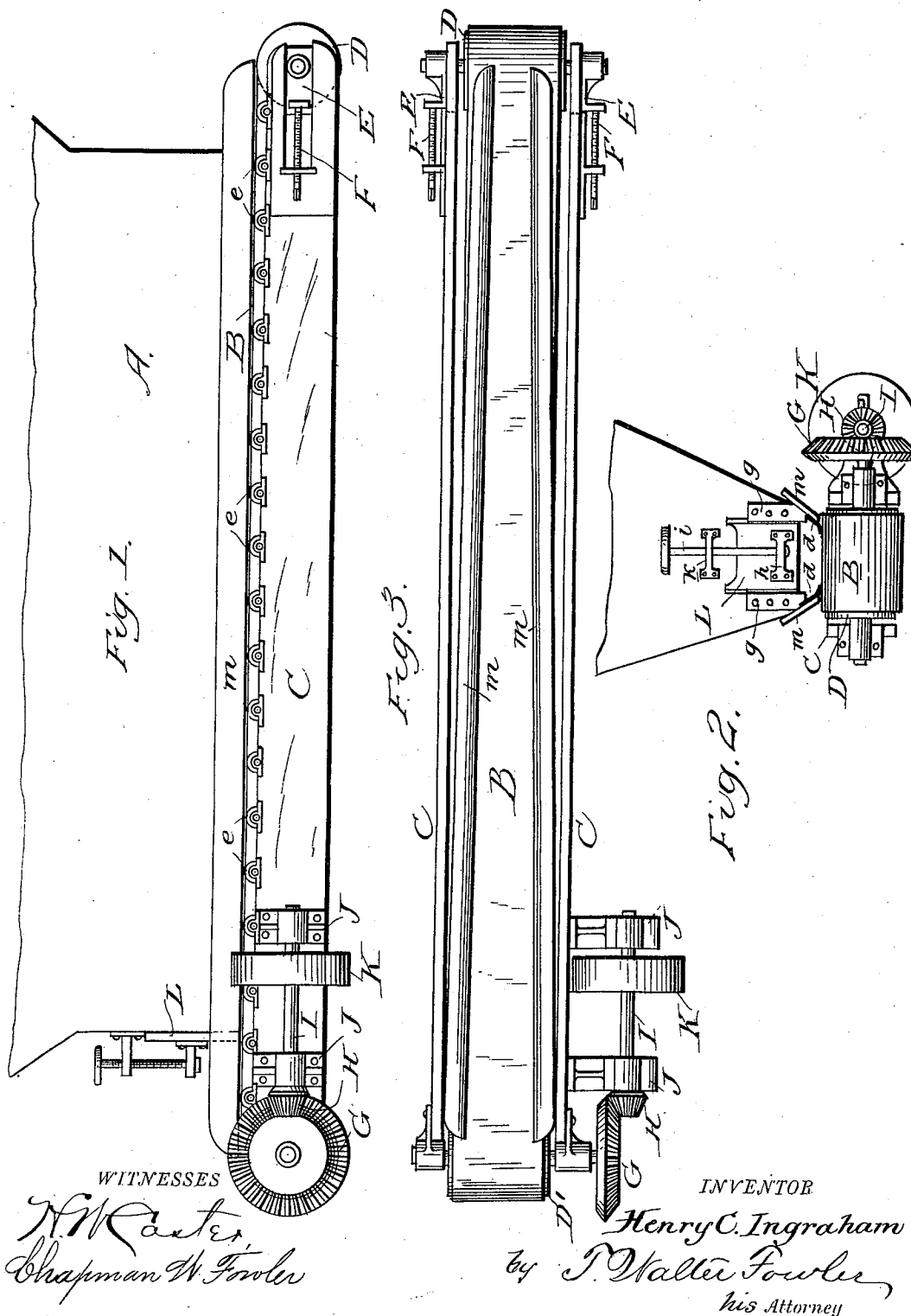
(No Model.)

H. C. INGRAHAM.

FEED REGULATOR FOR CLAY WORKING MACHINERY.

No. 588,715.

Patented Aug. 24, 1897.



UNITED STATES PATENT OFFICE.

HENRY C. INGRAHAM, OF BEVERLY, NEW JERSEY, ASSIGNOR TO THE AMERICAN CLAY-WORKING MACHINERY COMPANY, OF BUCYRUS, OHIO.

FEED-REGULATOR FOR CLAY-WORKING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 588,715, dated August 24, 1897.

Application filed May 5, 1897. Serial No. 635,189. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. INGRAHAM, a citizen of the United States, residing at Beverly, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Feed-Regulators for Clay-Working Machinery, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention is especially designed for use with machinery for working clay, and has for its object to provide a reliable, regular, and automatic feed of clay from the receiving bin or hopper to the mixing or other machine; and my invention consists of the parts and the construction and combinations of parts which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings, wherein similar letters of reference indicate like parts, Figure 1 represents a side elevation of a portion of a receiving bin or hopper, showing my improved feed-regulator. Fig. 2 is an end view showing the adjustable gate. Fig. 3 is a plan view of the feed-regulating conveyer detached from the bin or hopper.

The practice usually adopted in clay-working machinery is to deposit the material in receiving bins or hoppers, from whence it is fed to the machine through the medium of a spout or gate. The material may pass from the bin or hopper to a suitable mixing-machine, as in the case of pulverized clay or shale used, for making what is known as "stiff" mud brick, or may pass to a suitable steamer when it is desired to make semiplastic or semidry brick. The objection has been, however, that the tendency of the clay is to stick or adhere and clog, and if the feed-gate is opened to any considerable extent the material will be discharged in too great quantities. In the first case the material has to be loosened up by prodding and stirring with a pole in the hands of an operator, and in the second case the feed is not in such regular and predetermined quantities as is desired. As it is essential in feeding to either the mixing-machine or steamer to deliver the material as uniformly as possible, that the requisite amount of moisture may be added and also

that there may be no waste occurring from an oversupply at one time and a shortage of material at another time, the value of a reliable, uniform, and automatic feeding appliance in this art will be appreciated.

It is now believed to be the practice to regulate the feed to the machines as nearly as possible by the operator, whose duty it is to feed the dry pan or disintegrator; but this method is very uncertain for the reasons before stated and because a sufficient stock or supply of material cannot well be kept in reserve to meet the possibility of a stop made in the feed. Therefore receiving bins or hoppers of large holding capacity have not met with much favor, although the desirability of such large bins or hoppers is conceded.

The object of my invention is to enable a bin or hopper of large holding capacity to be used with a feeding mechanism that will deliver the material from the bin or hopper to the appropriate machine in a steady and uniform manner and in well-regulated quantities, overcoming the liability of the material clogging at the hopper discharge or discharging irregularly and insuring a positive automatic withdrawal of the material from the hopper uniformly and at any required quantity per hour that may be needed.

In the said drawings, A represents a hopper of suitable material and construction and adapted to have a large holding capacity. The lower portion of this hopper has downwardly-converging side walls, and its bottom is preferably left open from end to end. Below this bin or hopper, into which the material is received from the usual dry pan or disintegrator, (not shown,) and supported in any well-known manner, is an endless horizontally-traveling apron or belt B, whose width is somewhat in excess of the width of the hopper-opening, said apron or belt being constructed of leather, canvas, or other appropriate material and made, preferably, of one piece, with a close or flush joint at the meeting ends to maintain the continuity of the surface, as an irregular or rough joint in the apron will cause a ripple in the flow of the material and will enable the fine material to sift through it. The apron or belt is mounted in a frame C, in the ends of which

are journaled the drums or rollers D D', around which the apron or belt passes, one of said drums D being connected with boxes E, slidable in bearings in the frame and actuated by a screw F, whereby the degree of tension of the apron may be regulated. The shaft of the other drum D' is extended beyond one side of the frame C and carries a beveled gear-wheel G, which meshes with and is driven by a beveled pinion H on the horizontal shaft I, journaled in brackets or arms J, projecting from the frame, said shaft also carrying a pulley K, through which power is communicated to cause the apron or belt to travel below and parallel with the bottom of the hopper in the direction of the required delivery and at a moderate speed.

The bottom edges of the hopper should not rest in contact with the belt or apron, but should terminate a short distance above the same, and the intervening space is fully closed by means of strips or flaps d, of heavy canvas, muslin, or other flexible material, to prevent leakage and to prevent undue wear upon the apron. The apron is supported throughout its length by means of rollers e, journaled in the frame C, and the amount of material discharged from the hopper is controlled by means of a vertically-slidable gate L at one end of the bin or hopper and movable in guides g, said gate having a lug h, in which is secured a screw or threaded rod i, working through a suitable nut or threaded bearing k, projecting from the end of the bin or hopper. By operating this screw the gate may be raised and lowered and the quantity of material discharged regulated.

Along the lower sides of the hopper are secured in any suitable manner the inclined strips m, to which the flexible flaps or strips d are secured to prevent lateral leakage of the material and to form substantially a dust-proof packing, said strips m converging from the gate end of the hopper, as shown in Fig. 3, and forming hopper-like sides for the apron or endless conveyer. By thus converging the strips m the tendency of the material leaking out through the side edges is prevented, as the belt or conveyer will then feed the material forward along the gradually-widening space with an easy and regular motion and discharge it through the gate.

From the foregoing description it will be apparent that I am enabled to use a bin or hopper of large capacity as a storage-receiver for the material, and when the conveyer is in operation any tendency of the material to clog or run irregularly, even if it is damp, will be prevented. The feed is automatic and quite uniform as long as there is any material in the bin or hopper, as the endless conveyer forms a movable bottom under the bin or hopper for the entire length thereof and

the particles of clay will be kept in motion and agitated thereby, overcoming the annoyance of sticking or banking. The amount of discharge is regulated by the gate and the outflow is positively governed as long as there remains any material in the hopper. This insures a uniform feed to the machine.

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

1. The combination with a receiving bin or hopper having downwardly-converging sides and a bottom discharge, of a conveyer below said bottom and consisting of an endless apron or conveyer and means for operating it, a vertically-adjustable gate at one end of the hopper, for regulating the discharge, strips extending along the lower exterior edges of the hopper and the flexible packing strips or flaps carried by said exterior strips and extending along the sides of the hopper between the lower edges thereof and the conveyer to prevent leakage.

2. The combination with a receiving bin or hopper having a bottom discharge and a vertically-adjustable gate at one end, of an endless apron or conveyer below said bottom, the inclined rearwardly-converging strips along the lower exterior edges of the hopper and the flexible strips secured to the inner sides of the exterior strips and forming a packing at the junction of the hopper discharge and apron, to prevent leakage.

3. The combination of a bin or hopper having a bottom discharge, a conveyer below the same and forming a movable bottom therefor, and consisting of an endless apron or belt and a frame having end drums and intermediate rollers, movable boxes for the shaft of one of said drums and means for adjusting the boxes and regulating the tension of the apron or belt, a gear-wheel on the shaft of the other drum, a shaft parallel with the frame, having a pinion to engage said gear-wheel, and having a power-pulley, inclined strips along the lower exterior sides of the hopper, flexible strips secured to and extending along the inner lower sides of the inclined strips and forming a packing to prevent leakage at the joint between the hopper and conveyer, guides on the end of the hopper, a gate slidable in said guides and provided with a screw or threaded rod, and a nut or threaded bearing on the hopper through which the screw or rod passes, whereby the gate is adjusted to regulate the feed of the material.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. INGRAHAM.

Witnesses:

CLEMENTINE F. PAYNE,
JOHN A. PAYNE.