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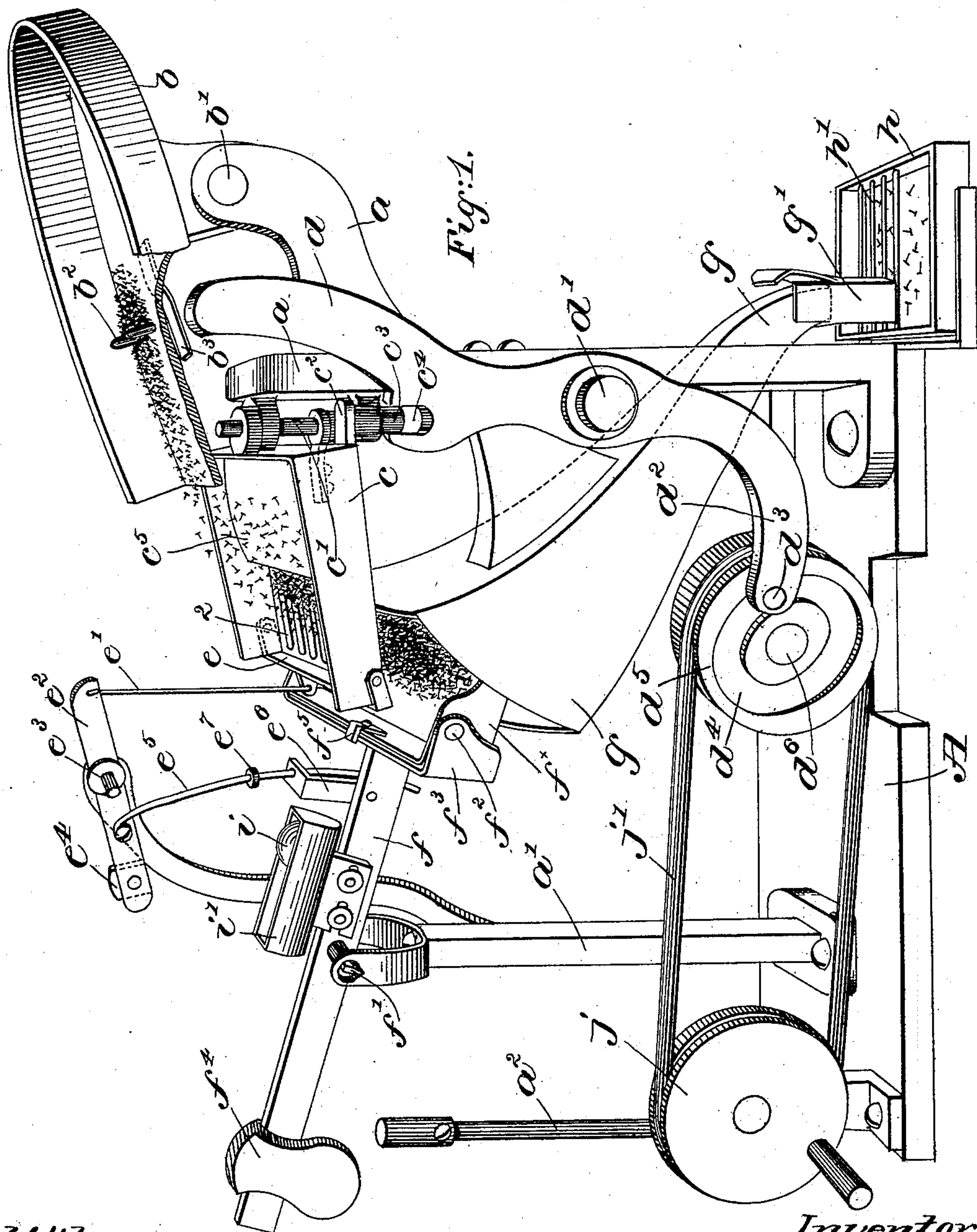
2 Sheets—Sheet 1.

J. KEITH.

MACHINE FOR AUTOMATICALLY WEIGHING TACKS.

No. 474,777.

Patented May 10, 1892.



Witnesses.

Fred M. Ashworth.
Louis N. Howell

Inventor.

Jeremiah Keith
by Lemby & Gregory Attys.

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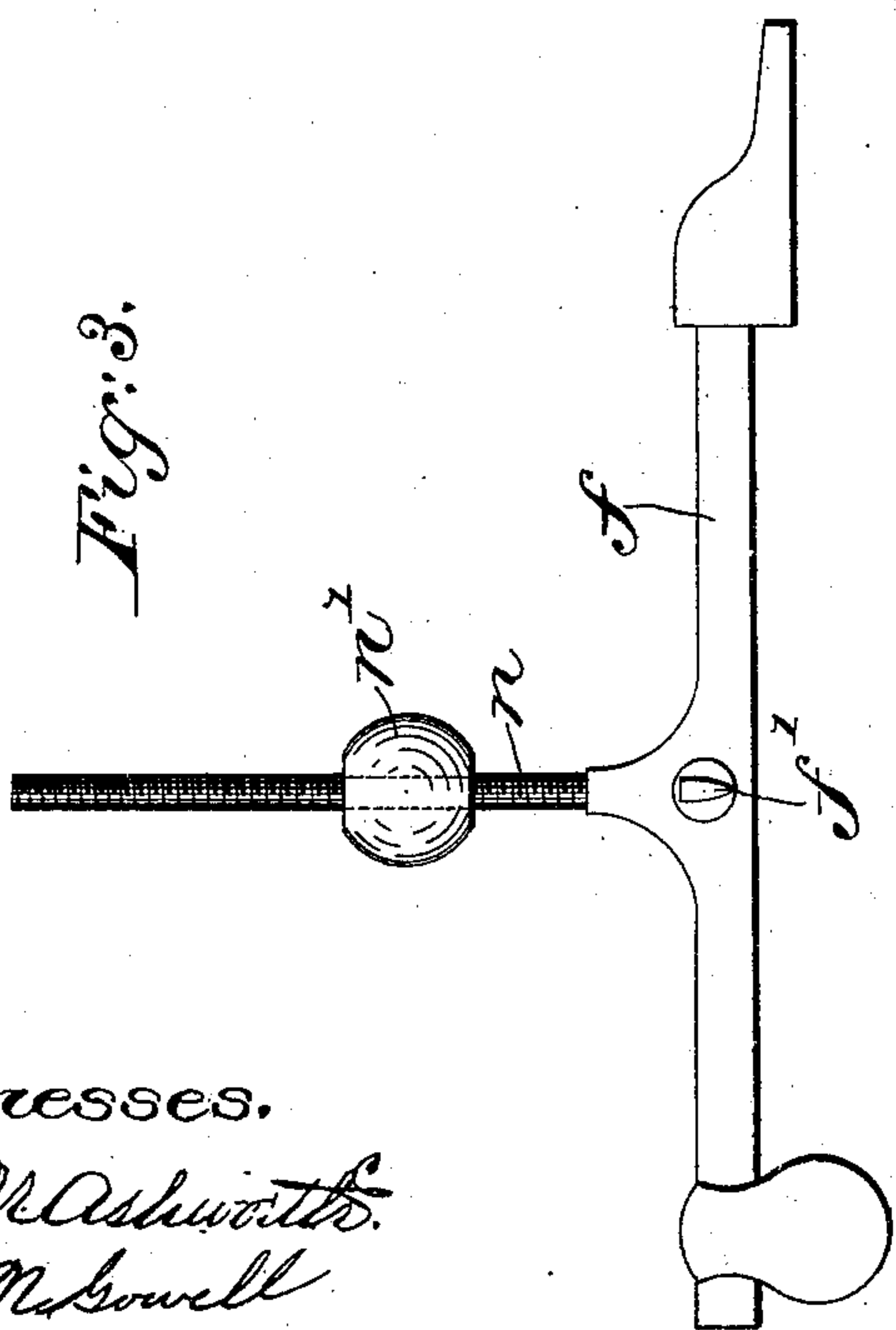
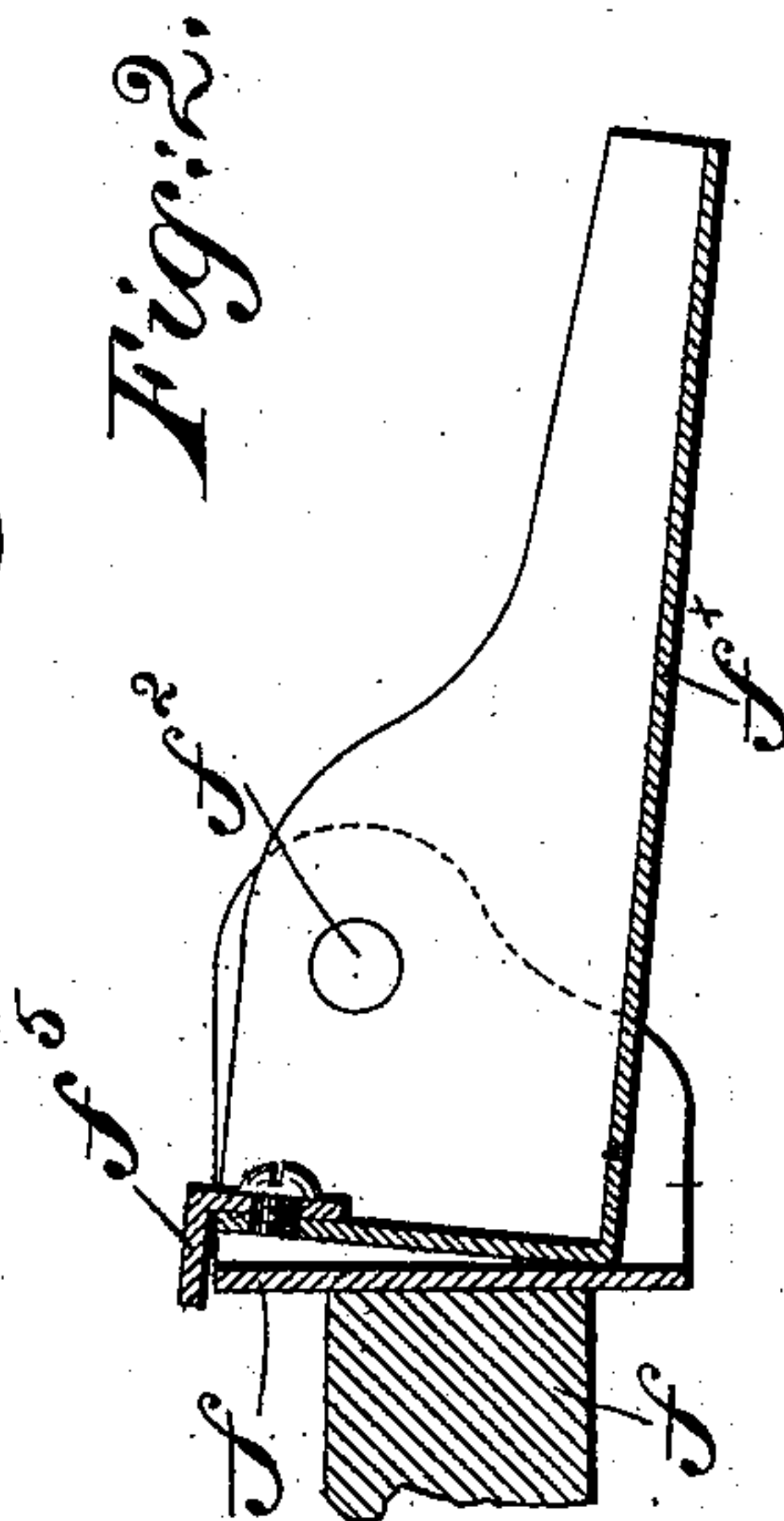
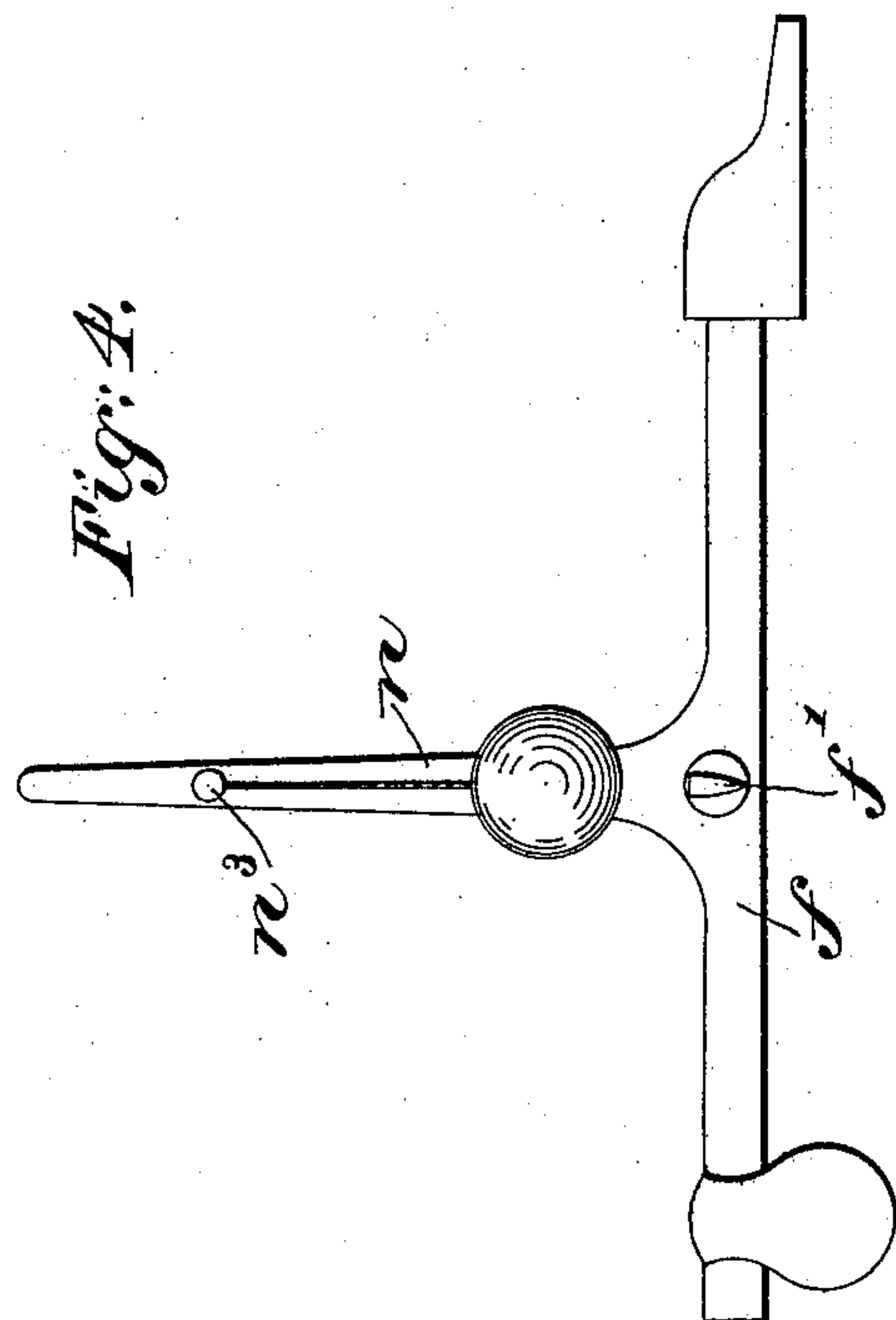
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UNITED STATES PATENT OFFICE.

JEREMIAH KEITH, OF NORTH MIDDLEBOROUGH, ASSIGNOR OF ONE-HALF
TO CHARLES B. GARDINER AND DAVID F. RANNEY, OF RAYNHAM,
MASSACHUSETTS.

MACHINE FOR AUTOMATICALLY WEIGHING TACKS.

SPECIFICATION forming part of Letters Patent No. 474,777, dated May 10, 1892.

Application filed December 9, 1891. Serial No. 414,453. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH KEITH, of North Middleborough, county of Plymouth, State of Massachusetts, have invented an Improvement in Machines for Automatically Weighing Tacks and other Articles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In tack manufactories the tacks and nails are put up in small packages of different sizes, the quantity being determined by weight. In putting up the tacks or nails in packages it is now customary to weigh the tacks and then put them in the wrapper or package. These operations are carried on by hand, and in order to package the tacks or nails cheaply enough to meet the demands of a competitive market cheap help must be utilized. Such class of help is usually careless, so that sometimes the packages contain more and at other times less than the quantity required.

This invention has for its object to construct a machine for packaging tacks, nails, &c., by which the tacks are automatically weighed and delivered to the packages or wrappers.

In accordance with this invention, the tacks, nails, or other articles are placed in a suitable hopper, and means are provided for discharging the tacks, nails, &c., therefrom, which, as herein shown, consists of mechanism for vibrating the hopper. A tack-receiving pan is provided, which receives the tacks, nails, &c., delivered from said hopper, and a weight or equivalent device is employed for holding the said tack-receiving pan in its normal position to retain the tacks until a sufficient or predetermined quantity have been deposited therein, when it is overcome and the tacks are discharged. A discharging weight or equivalent device is also employed, which is moved in one direction by the contents of the tack-receiving pan and in the opposite direction by the weight, which is utilized to hold the said pan in its normal position, said discharging-weight operating to hold the tack-receiving pan in its abnormal position until over-

come by the other weight. This discharging-weight is provided mainly for the purpose of giving the tack-receiving pan an opportunity to become completely discharged. A suitable gate is provided for the hopper, which operates to close the outlet of the same when the tack-receiving pan is not in position to receive the tacks discharged from said hopper—as, for instance, when said pan is discharging its contents—and for the purpose of accurately timing the parts, so that the gate will be closed when the tack-receiving pan is thus moved out of its normal position, it is connected indirectly, or it may be directly, with said pan that its operation may be governed by the movement of said pan.

Figure 1 shows in perspective a machine for automatically weighing tacks, nails, and the like, embodying this invention; Fig. 2, a sectional detail to be referred to; Figs. 3 and 4, modifications to be referred to.

The base A has erected on it several uprights which support the operating parts.

The hopper, as herein shown, is made up of two separate receivers, one of which, as *b*, is pivoted at *b'* to the upper end of the upright *a* and the other of which, as *c*, is pivoted at *c'* to said upright *a*, the axis of the pivot *c'* of the receiver *c* being at right angles to the axis of the pivot *b'* of the receiver *b*. The receiver *b* is inclined and has an outlet at its lower end, and is provided with several spurs *b³*, which aid in separating the tacks which are placed in the receiver. A lever is provided, the lower end of which is pivoted at or about midway its length at *d'*, the upper end of said lever, as *d*, terminating just beneath the bottom of the receiver *b*, and the lower end of said lever, as *d²*, being provided with a pin *d³*, which follows in a cam-groove *d⁴* of a wheel or disk *d⁵*, pivoted at *d⁶* to an upright on the base. As the disk *d⁵* revolves, the lever *d d²* is vibrated and the upper end thereof, striking against a flat spring *b³*, secured to the under side of the receiver *b*, operates to vibrate the said receiver on the pivot *b'*. A lug *c²* is secured to the rear side and at one end of the receiver *c*, it having on its under side a pin *c³*, which enters a recess *c⁴*, formed

in the lever d , and as the said lever is vibrated the receiver c will be vibrated on its pivot c' . Hence it will be seen that the said receivers b and c are each vibrated, but on axes at right angles with relation to each other. A plate c^5 is placed in the receiver c , having a convex surface, as shown, said plate being located just beneath the outlet of the receiver b , so that the tacks on leaving the receiver b will fall upon this convex-surfaced plate. By means of this plate, shaped as shown and described, the tacks are spread to all parts of the receiver c as it is vibrated. On the interior of the receiver c and extending longitudinally along the bottom thereof are ribs 2, which serve as guide-ribs for the tacks to prevent them congregating together after having been spread by the spreader c^5 . The receiver c has an outlet at its lower end, as shown, and a gate e is provided for said outlet, which, as herein shown, consists of a bar having inturned ends or ears, by means of which it is pivotally connected to the receiver. The gate e is adapted to be raised and lowered to close or open the outlet, as desired. The gate e is connected by a link e' to one end of a lever e^2 , pivoted at e^3 , and to said lever at the opposite side of its pivotal connection a suitable weight e^4 is attached, or the lever e^2 may be otherwise controlled. A link e^5 is also connected to the lever e^2 at that side of the pivotal connection opposite the link e' , said link e^5 passing down through a suitable guide e^6 , secured to a beam f , pivoted at f' to the upper end of a standard a' . The beam f is adapted to be moved or tilted on its pivot, and a stop e^7 is secured to the link e^5 , which is engaged by the upper end of the guide e^6 when said beam f approaches its elevated or normal position, and thereby lifts the link e^5 , turning the lever e^2 on its pivot and lowering the gate e , and when said beam f descends or assumes its abnormal position, the said gate e is allowed or caused to rise and close the outlet of the receiver c .

A tack-receiving pan f^x is pivotally connected at f^2 to a yoke or frame f^3 , secured to one end of the beam f , and upon the opposite side of the pivot f' a weight f^4 is adjustably arranged. A stop f^5 is secured to the upper edge of the tack-receiving pan f^x to prevent said pan being turned upwardly on its pivots, and to prevent said pan from being turned downwardly on its pivots the lower edge thereof is adapted to strike against the lower edge of the yoke or frame f^3 , as shown in Fig. 2, yet between these stops a certain amount of lost motion is provided that the pan may tip or turn slightly on its pivots.

A delivery-chute g , having a contracted terminus, is provided, into which the tacks from the tack-receiving pan f^x are discharged, the lower end of said chute g being quadrangular or other suitable shape in cross-section to fit or correspond in shape to the wrapper or package g' , which is adapted to be placed at the outlet of said chute to receive the tacks.

A pan h is secured to the base A , which is provided with suitable bars or supports h' at a short distance above the bottom thereof, upon which the wrapper or package g' may be placed, said pan serving to catch and hold any tacks that may escape from the wrapper or package.

A weight, as i , herein represented as a ball, is contained in a trough-shaped guideway i' , secured to the beam f adjustably, as shown. The weight i is made quite small and is adapted to move from end to end of the trough, according as the beam ascends or descends. When the tack-receiving pan f^x is in its elevated or abnormal position, the weight i will rest at the extreme left-hand end of the trough i' , which will be either at or at the left-hand side of the center of gravity of the beam; but when a predetermined quantity of tacks have been delivered to the tack-receiving pan, sufficient to overcome the weight f^4 , the said beam f will be tilted on its pivots f' and the weight i will roll along the trough to the extreme right-hand end thereof and will there remain until overbalanced by the weight f^4 . This weight is used for the especial purpose of retaining the tack-receiving pan in its abnormal position a sufficient length of time for it to completely discharge its contents, and were this weight omitted a portion of the contents of the pan might be discharged, when it would return to its normal position to receive some more tacks from the receiver c . Hence I herein denominate this weight i or any equivalent device a "discharge-weight." An upright a^2 is provided, which serves as a stop for the beam f when the tack-receiving pan f^x is in its normal position.

I have herein shown a hand-wheel j , connected to the disk d^5 by a belt j' , as a means of rotating said disk; but any other suitable means may be employed. It will be seen that as the disk d^5 rotates the receivers b c , which constitute the hopper, are vibrated and the tacks delivered to the tack-receiving pan f^x , and when a certain quantity have been delivered, sufficient to overcome the weight f^4 , said pan will descend, and by the indirect connection of the gate e with the beam f the gate at such time will close the outlet of the receiver c to prevent tacks from being discharged during the time that the pan is out of its normal position. As soon as the tacks have been completely discharged the said pan returns to its normal position and the gate is lowered or opened.

Referring to Fig. 3, I have represented the beam f as provided with an upright n substantially over its pivots f' , and on said upright a weight n' is adjustably secured. With this construction, when the beam f is in its normal position, with the tack-receiving pan in its elevated or normal position, the weight n' will lie either in or at the left-hand side of the center of gravity; but when the tack-receiving pan descends, said weight will be moved into a position at the right-hand

side of the center of gravity and will there remain until overpowered by the weight f^4 .

In Fig. 4 the upright n , instead of having secured to it a weight n' , as shown in Fig. 3, has a weight n^2 , which is suspended from a pin n^3 , the purpose being the same as that shown in Fig. 2.

When the tack-receiving pan is in its normal position, I prefer that the discharge-weight shall lie at the center of gravity or in the line of gravity, so that it will have no direct effect on the beam, that its weight will not have to be overcome by the contents of the pan; but I do not desire to limit myself to such normal location of the discharge-weight; nor do I desire to limit my invention to any particular construction of discharge-weight, as it is obvious that many forms may be used which will come within the spirit and scope of my invention.

Instead of the particular construction of hopper herein shown any other suitable hopper may be employed, yet one made in two parts vibrating at right angles to each other possesses the advantage of insuring equal spreading of the tacks.

By employing the gate which when open lies beneath the receiver, or substantially so, the danger of the tacks obstructing its movement is obviated, yet I do not desire to limit my invention to any specific construction of gate.

I claim—

1. In a machine for automatically weighing tacks, nails, &c., a tack-delivering hopper, combined with a tack-receiving pan and a weight for holding said pan in position to retain the tacks until overcome by the weight of the tacks deposited therein, and a discharging-weight to assist in retaining the tack-receiving pan in its abnormal position to discharge the tacks, substantially as described.

2. In a machine for automatically weighing tacks, nails, &c., a laterally-vibrating tack-delivering hopper, and means to vibrate it, combined with a tack-receiving pan having an open delivery end, and a weight for holding said pan in position to retain the tacks until overcome by the weight of the tacks deposited therein, substantially as described.

3. In a machine for automatically weighing tacks, nails, &c., a tack-delivering hopper, a gate therefor, combined with a tack-receiving pan and a weight for holding the said pan in position to retain the tacks until overcome by the weight of the tacks deposited therein, and a discharging-weight to assist in retaining the tack-receiving pan in its abnormal position, substantially as described.

4. In a machine for automatically weighing tacks, nails, &c., a tack-delivering hopper and an automatically-closed gate therefor, combined with a tilting tack-receiving pan having an open delivery end and a weight for holding said pan in position to retain the tacks until overcome by the weight of the tacks deposited therein, and connections between said

pan and gate to maintain the latter open when the pan is in normal position, substantially as described.

5. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, combined with a tilting weighing-pan having an open delivery end, its pivoted supporting-beam, and a discharging-weight movable between its pivot and the pan, substantially as described.

6. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, combined with a weighing-pan which receives the articles from said hopper, a pivoted pan-support beam, a weight adjustable thereon, and a discharging-weight or equivalent device moved in one direction by the weight of the contents of the pan and in the opposite direction by the weight on the beam, substantially as described.

7. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, a gate therefor, combined with a tilting weighing-pan, and connections between said gate and pan, whereby the latter is adapted to operate the former, substantially as described.

8. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, a gate for said hopper, combined with a weighing-pan which receives the articles from said hopper, a pivoted pan-supporting beam, a weight adjustable thereon, and a discharging-weight or equivalent device moved in one direction by the weight of the contents of the pan and in the opposite direction by the weight on the beam, substantially as described.

9. In a machine for automatically weighing tacks, nails, &c., a hopper consisting of two movable tack-receivers, one arranged to receive tacks from the other, combined with a tack-receiving pan, and means for holding it in its normal position until a certain quantity of tacks have been deposited therein, substantially as described.

10. In a machine for automatically weighing tacks, nails, &c., the hopper consisting of two pivoted tack-receivers, the axes of the pivots being at right angles with relation to each other, and means for moving said receivers on their pivots, combined with a tack-receiving pan, and means for holding it in its normal position until a certain quantity of tacks have been deposited therein, substantially as described.

11. In a machine for automatically weighing tacks, nails, &c., a hopper consisting of two vibrating receivers, one arranged to receive tacks from the other, and a spreader contained in the second receiver, combined with a tack-receiving pan, and means for holding it in its normal position until overbalanced by the weight of the tacks contained in said pan, substantially as described.

12. In a machine for automatically weighing tacks, nails, &c., a hopper, and a gate for it combined with a tack-receiving pan, a pivoted beam supporting it, a weight adjustably

arranged on said beam, a discharging-weight, as *i*, and a trough arranged on said beam containing said discharging-weight, substantially as described.

5 13. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, an automatically-movable gate, and an automatically-movable tack-receiving pan and a freely-movable discharging-weight for said pan,
10 combined with a delivery-chute contracted at its end, and the pan *h*, substantially as described.

14. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, a
15 gate therefor, and means to automatically close said gate, combined with an automatically-movable tack-receiving pan having an open delivery end and which controls the opening of said gate, and a delivery-chute,
20 substantially as described.

15. In a machine for automatically weighing tacks, nails, &c., a tack-delivering hopper, combined with a pivoted beam having a yoke at one end, a tack-receiving pan having an
25 open delivery end and pivoted to said yoke and provided with a limiting-stop, as shown, a weight, as *f*⁴, adjustably arranged on said

beam, and a discharging-weight carried by said beam and movable between its pivot and the pan, substantially as described. 30

16. In a machine for automatically weighing tacks, nails, &c., a tack-delivering hopper, a substantially vertical exit therefor, and a gate controlling the said exit and pivotally connected to said hopper and normally occupying a position beneath said hopper, or substantially so, to open the exit, and when ascending to move upwardly across the edge of and to close said exit, substantially as described. 35 40

17. In a machine for automatically weighing tacks, nails, &c., a vibrating hopper, a gate therefor, and operative mechanism for said gate having as a component part of it a loosely-connected link, whereby the gate may be moved unrestrained by the vibrating hopper, substantially as described. 45

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

JEREMIAH KEITH.

Witnesses:

BERNICE J. NOYES,
EMMA J. BENNETT.