No. 719,166. PATENTED JAN. 27, 1903.

G. R. WILLIAMS.

PAPER FEEDING MACHINE.

APPLICATION FILED JUNE 10, 1901.

NO MODEL.

Fig. 2.

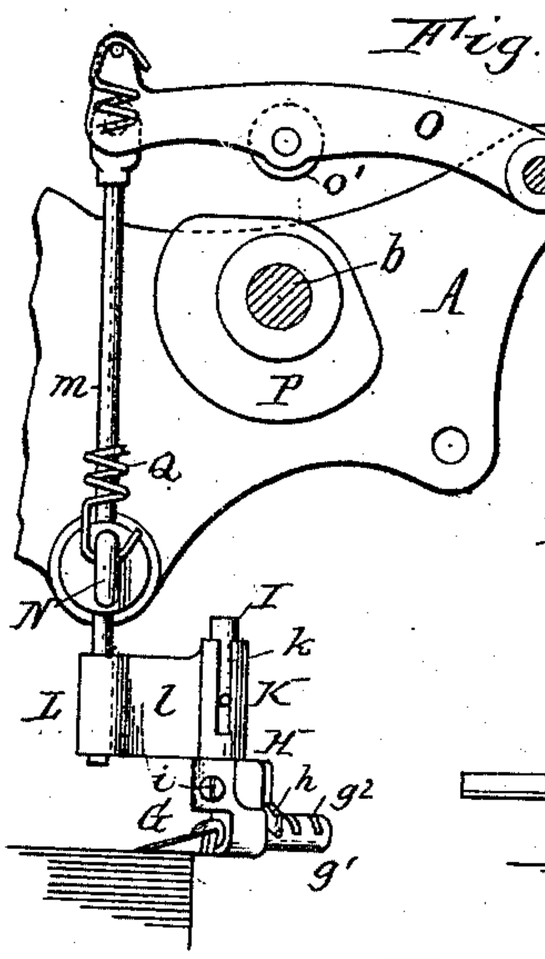


Fig. 1.

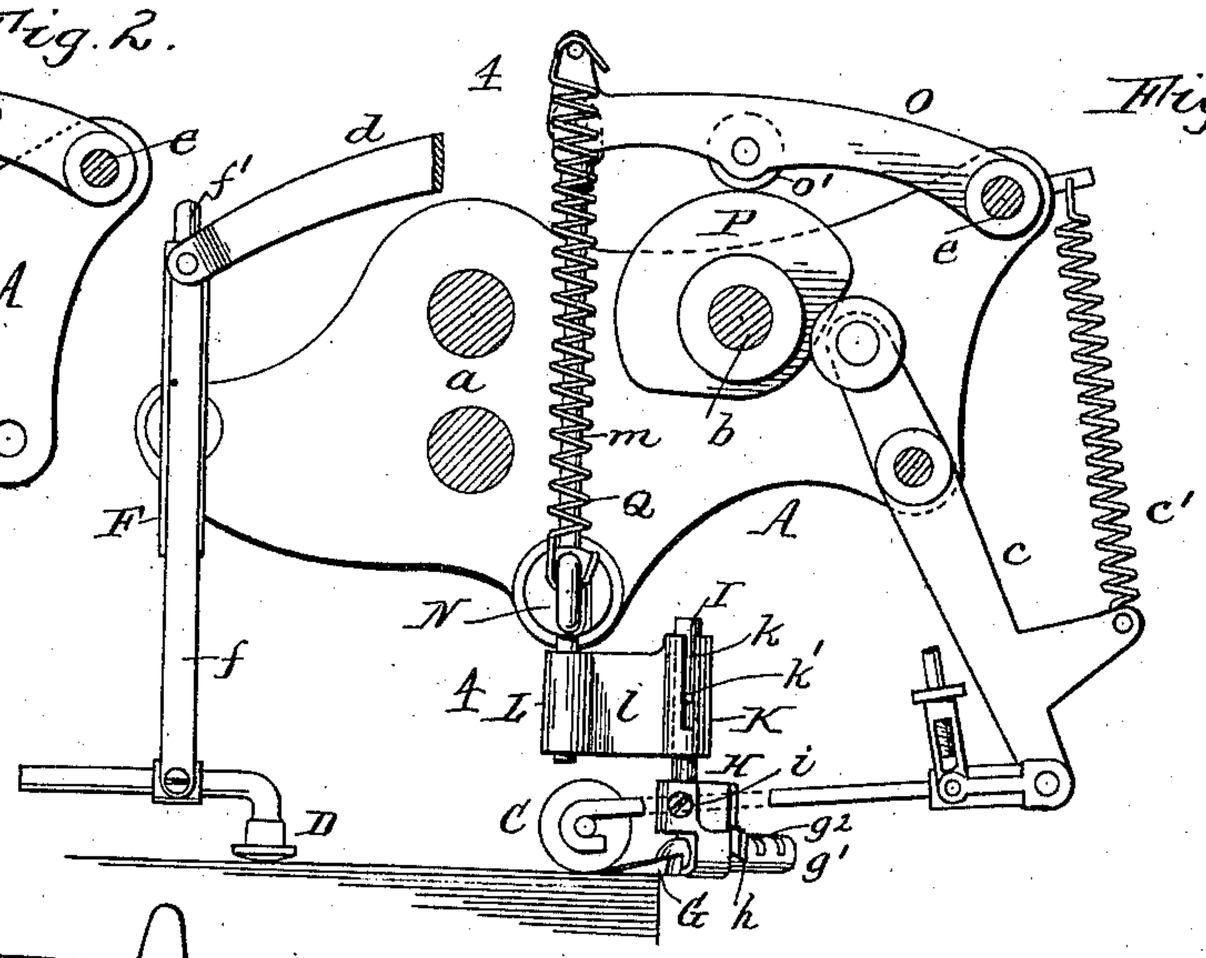


Fig. 5.

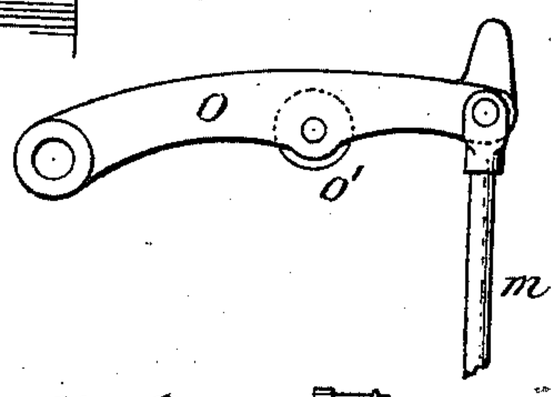


Fig. 3.

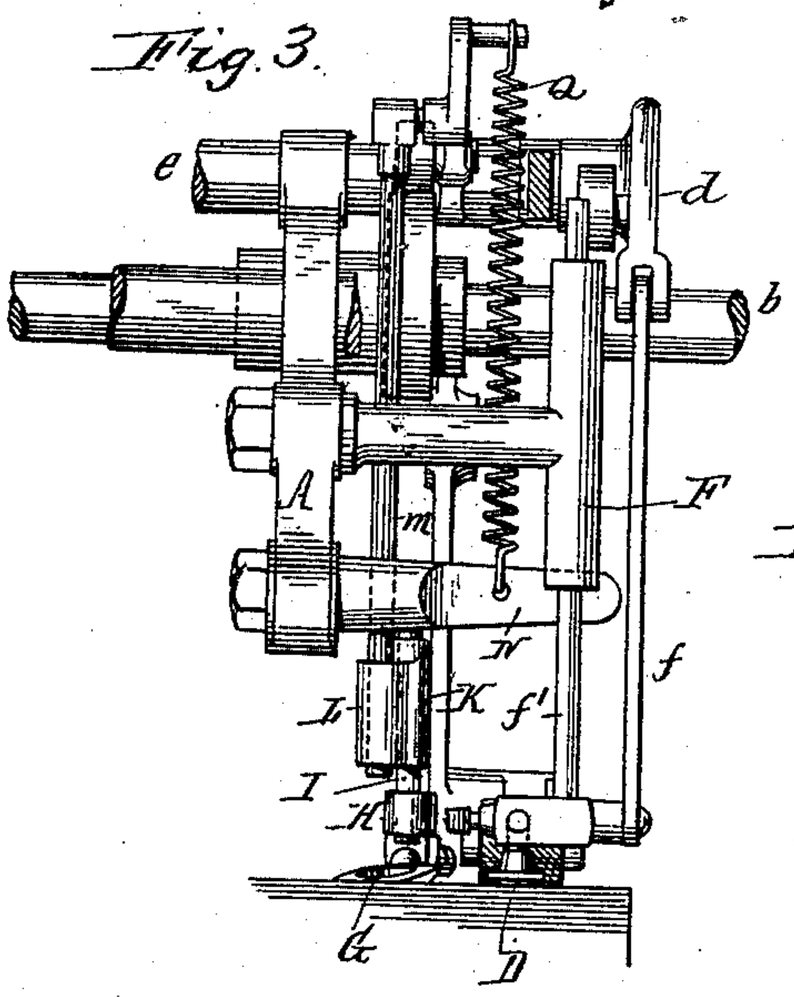


Fig. 6.

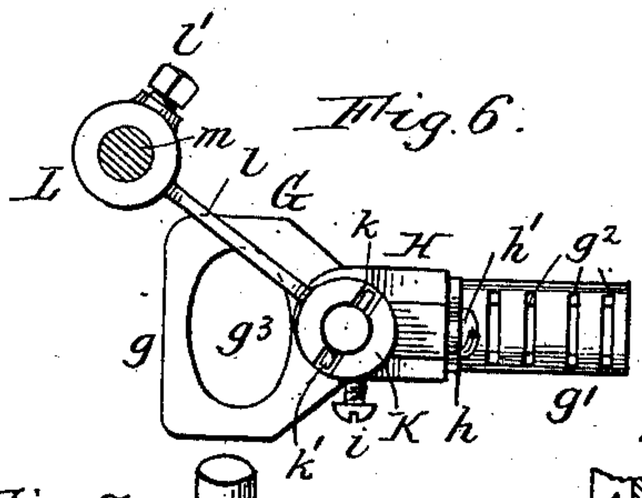


Fig. 7.

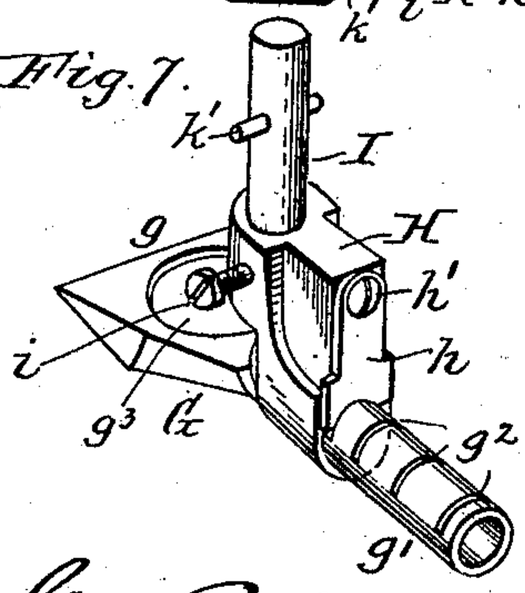
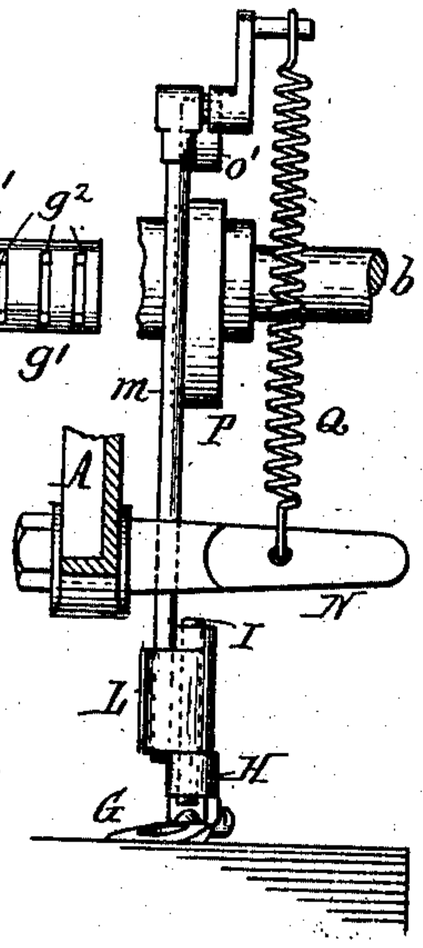


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE R. WILLIAMS, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ECONOMIC MACHINE COMPANY, OF NEW YORK, N. Y.

PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 719,166, dated January 27, 1903.

Application filed June 10, 1901. Serial No. 63,902. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. WILLIAMS, a citizen of the United States, residing at New York, in the borough of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

This invention relates to that class of automatic paper-feeding machines in which the sheets are fed successively from the top of a pile, and has reference more particularly to the pile-retaining fingers, which bear upon the pile at or near the rear corners thereof and hold the pile in position against the disturbing action of the buckling mechanism by which the top sheet is loosened preparatory to being fed off.

The particular class of pile-retaining fingers to which this invention relates are so constructed and operated that the finger always rests upon the pile and is pressed firmly upon the pile by spring-pressure except when the top sheet is being pulled out from underneath the retaining-finger, during which period the spring-pressure upon the finger is released and the finger rests upon the pile only by gravity, so that the top sheet can be pulled out from under the finger without danger of tearing the sheet, but is prevented from springing back under the finger by the latter remaining upon the pile.

The object of this invention is to provide a simple and effective pile-retaining finger of this character and to render the finger readily adjustable with reference to the surface of the pile of sheets and with reference to the point at which the pressure of the finger is most effectively applied.

In the accompanying drawings, Figure 1 is a sectional front elevation of a portion of the buckling mechanism of a paper-feeding machine provided with my improved pile-retaining finger, the parts being shown in the position in which the spring-pressure is removed from the finger. Fig. 2 is a similar elevation of the finger and connecting parts with the pressure-spring broken away and the parts in the position in which the spring-pressure is applied to the finger. Fig. 3 is an end elevation of the parts shown in Fig. 1. Fig. 4 is a vertical section on line 4 4, Fig. 1. Fig. 5 is an elevation of the rock-arm by which the spring-pressure is removed from the finger viewed from the side opposite to that shown in Fig. 1. Fig. 6 is a top plan view of the finger on an enlarged scale. Fig. 7 is a perspective view of the same.

Like letters of reference refer to like parts in the several figures.

A represents one of the upright frames of the buckling-head, and *a* the longitudinal bars on which this frame is supported and which are secured, as usual, to the main frame of the machine. (Not shown.) *b* is the rotary cam-shaft of the buckling mechanism; C, the reciprocating buckling-finger; *c*, the rock-arm by which this finger is actuated by a cam (not shown) on the shaft *b*, and *c'* a return-spring. D represents the presser-foot, against which the top sheet is buckled by the buckling-finger, and *d* the rock-arm by which this foot is raised and lowered. This arm is pivoted on a fixed shaft *e*, passing through the outer and upper portion of the frame A, and is connected at its free end by a rod *f* with the upright spindle *f'* of the presser-foot, which spindle is guided in an upright bearing-sleeve F, secured to the inner portion of the frame A. These parts may be of any ordinary or suitable construction and are shown merely to illustrate one way of associating my improved pile-retaining finger with a buckling mechanism.

G represents the pile-retaining finger or corner toe, which rests upon the top sheet of the pile near the rear corner thereof. This finger has preferably the form of a wedge, having a flat lower surface and a sloping upper surface, which terminates in a broad front edge *g*.

g' is the horizontal shank of the finger, which extends outwardly from the thick outer end of the same. This shank is cylindrical and passes through a corresponding horizontal opening in the lower portion of a bearing-block H. The finger can be adjusted toward and from this block by sliding the shank in the opening and is secured in its adjusted position by a locking dog or plate *h*, which is attached to the rear side of the bearing-block by a screw *h'*. This dog projects

with its lower end into one of a series of notches g^2, formed transversely in the upper side of the shank g'. These notches are somewhat deeper than required for receiving the dog, so that a small clearance is formed between the lower end of the dog and the bottom of the notch in which it is engaged, which permits of a sufficient swiveling movement of the finger and its shank in the bearing-block to enable the finger to adapt itself to the undulating top surface of the pile. The shank may be hollow, as shown, and the finger may be provided with an opening g^3 to reduce the weight of these parts.

I represents a cylindrical stem, which extends upwardly from the bearing-block. The latter is provided with a cylindrical socket in which the stem is secured by a set-screw i or some other fastening, so that the finger can be adjusted about this stem to project in the desired direction therefrom.

K represents a pressure-sleeve which surrounds the upper portion of the stem i and is capable of moving up and down on the same. By moving the sleeve down upon the bearing-block pressure is applied to the latter, and the finger is firmly pressed upon the pile, while by raising the sleeve from the block the latter and the finger are relieved from the pressure, and the finger is allowed to rest upon the pile merely by gravity.

k represents vertical slots formed in the pressure-sleeve on opposite sides thereof, and k' represents pins or projections on the stem I, which engage in these slots and hold the latter from turning in the sleeve. Any other suitable means for preventing the stem from turning in the sleeve may, however, be employed.

The pressure-sleeve K is formed at one end of a horizontal arm l, which is provided at its opposite end with an attaching-sleeve L and set-screw l', by which the pressure-sleeve is secured to the lower end of a vertically-movable spindle m. The latter is guided near its lower end above the attaching-sleeve in a bracket N, which is secured to the frame H of the buckling-head. The spindle m is connected at its upper end to the free end of a rock-lever O, pivoted on the stationary shaft e or some other support. This lever is raised by a cam P on the shaft b and lowered by a spring Q, connected at its upper end to the lever O and at its lower end to the bracket N or some other fixed part. The lever O is preferably provided between its ends with a roller o', which is engaged by the cam. When the lever O is raised by the salient part of the cam, as shown in Fig. 1, the pressure-sleeve is raised from the bearing-block of the finger and the latter rests upon the pile simply by gravity. When the roller of the lever leaves the salient part of the cam and passes to the low part thereof, the lever is lowered by the spring until the pressure-sleeve bears upon the bearing-block of the finger, as shown in Fig. 2. The lever is now unsupported by the cam, and the spring-pressure falls upon the finger and holds the latter firmly down upon the pile. The cam is so shaped and timed that it applies the spring-pressure to the finger except during that period of time during which the buckling-finger pulls the top sheet out from under the retaining-finger. At this time the cam raises the rock-lever O and the spindle and pressure-sleeve connected therewith, whereby the sleeve is raised from the retaining-finger, and the latter is allowed to rest upon the pile simply by gravity until the cam allows the pressure-sleeve to descend and bear again upon the finger by the spring-pressure.

The pile-retaining finger can be adjusted about the lower end of the stem I as a pivot, so as to project in the desired direction from the same, and it can be adjusted toward and from this stem so as to bear upon the pile at the proper point, and it is capable of a sufficient swiveling adjustment about its horizontal shank g' as a pivot to adapt its lower surface to the top surface of the pile, which may be more or less uneven or undulating, and it is free to move up or down in the pressure-sleeve as a vertical guide. The pile-retaining finger can by this means be nicely adjusted as may be necessary for its most efficient operation.

I claim as my invention—

1. The combination of a pile-retaining finger provided with an upwardly-projecting stem, a pressure-sleeve capable of vertical movement on said stem and provided with a laterally-projecting arm, an upright rod having its lower end attached to said arm on one side of said sleeve, a fixed guide in which the lower portion of said rod is guided above said arm, a rock-lever connected with the upper end of said rod, a cam by which said rock-lever is raised to lift the pressure-sleeve from the finger, and a spring attached at its upper end to said rock-lever and at its lower end to a fixed support for lowering the pressure-sleeve upon said finger, substantially as set forth.

2. The combination of a pile-retaining finger provided with an upwardly-projecting stem, a pressure-sleeve capable of vertical movement on said stem and provided with a laterally-projecting arm, an upright rod having its lower end attached to said arm on one side of said sleeve, a stationary frame, a bracket secured thereto above said arm and provided with a vertical guide for the lower portion of said rod, a rock-lever connected with the upper end of said rod, a cam by which said rock-lever is raised to lift the pressure-sleeve from the finger, and a spring attached at its upper end to said rock-lever and at its lower end to said bracket, substantially as set forth.

3. The combination of a pile-retaining finger, a bearing-block to which said finger is attached, and a horizontal swiveling connection between said finger and block, whereby said

finger can be adjusted about a horizontal axis for adjusting the finger to the surface of the pile, substantially as set forth.

4. The combination of a pile-retaining finger, a bearing-block to which said finger is attached, a horizontal swiveling connection between said finger and block, and means for adjusting said connection in the direction of its horizontal axis, substantially as set forth.

5. The combination of a pile-retaining finger provided with a horizontal shank, a bearing-block in which said shank is capable of a swiveling movement, an upright stem about which said block can be adjusted horizontally, and a pressure-sleeve capable of vertical movement on said stem, substantially as set forth.

6. The combination of a pile-retaining finger provided with a horizontal shank, a bearing-block in which said shank is adjustably seated, a pressure-sleeve arranged above said block, a stem extending from said block upwardly through said sleeve, means for adjusting said block about said stem, means for preventing said stem from turning in said sleeve, and mechanism whereby pressure is periodically applied by said sleeve, substantially as set forth.

7. The combination of a pile-retaining finger provided with a horizontal shank, a bearing-block in which said shank is capable of longitudinal adjustment, means for holding the shank in its adjusted position, an upright stem about which said block can be adjusted horizontally, and a pressure-sleeve capable of vertical movement on said stem, substantially as set forth.

8. The combination of a pile-retaining finger provided with a horizontal shank, a bearing-block in which said shank is capable both of longitudinal adjustment and of a swiveling movement, and a locking device whereby said shank is attached to said bearing-block and which permits of a limited swiveling movement of the shank in the bearing-block, substantially as set forth.

9. The combination of a pile-retaining finger provided with a cylindrical horizontal shank having a longitudinal series of notches, a bearing-block in which said shank is capable both of longitudinal adjustment and a swiveling movement, and a locking-dog attached to said block and projecting partly into one of said notches, substantially as set forth.

Witness my hand this 8th day of June, 1901.

GEORGE R. WILLIAMS.

Witnesses:
JAMES J. BOYAN,
GEO. C. KIMBALL.