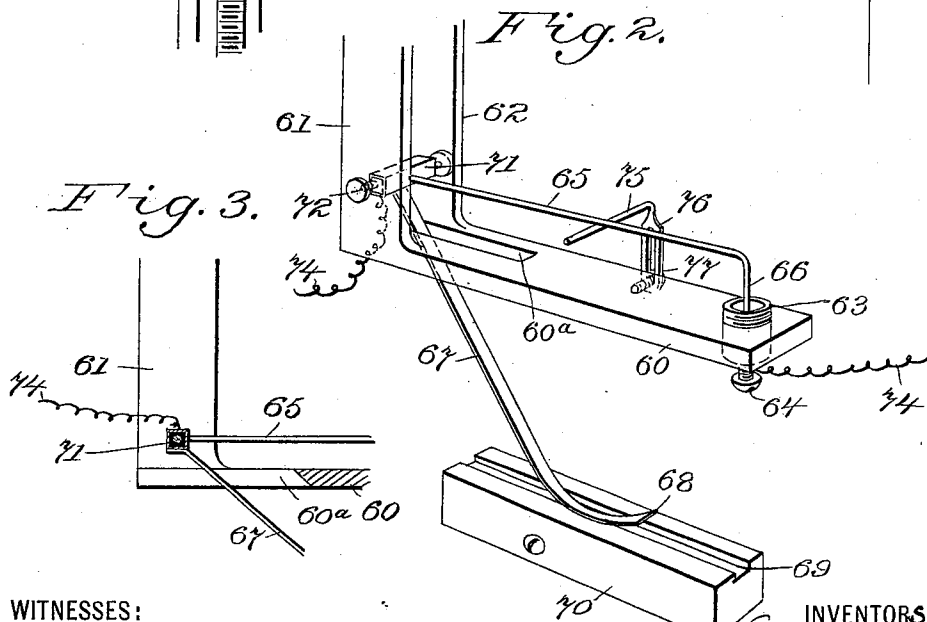
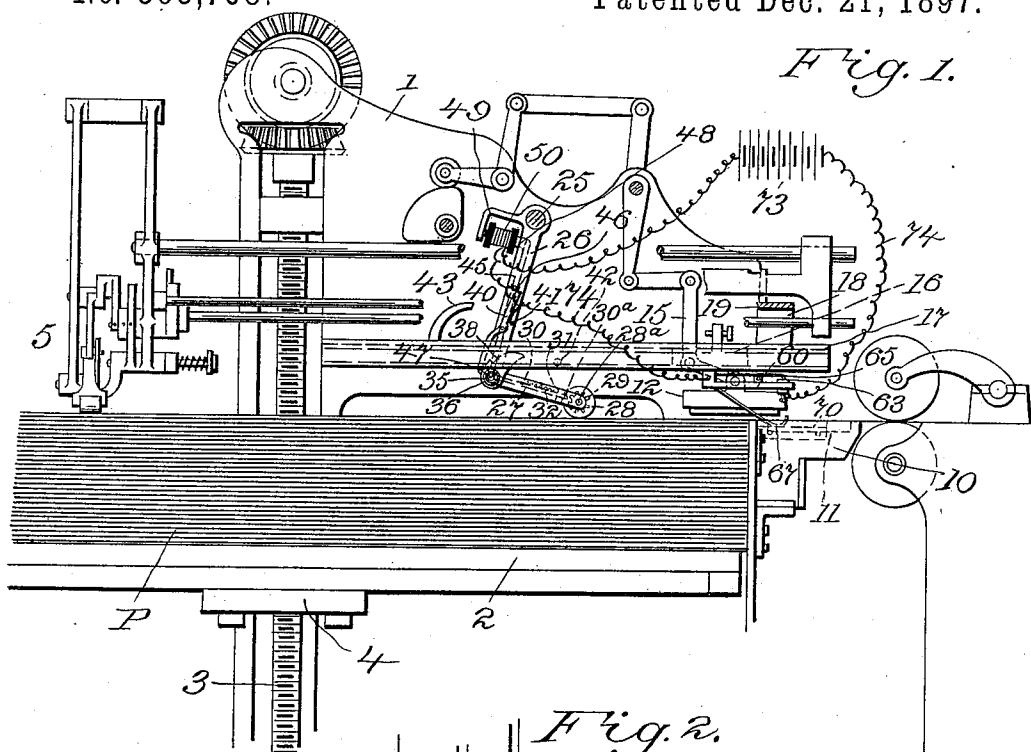


(No Model.)

T. C. DEXTER & C. RANSOM.
ELECTRIC CONTROLLING DEVICE FOR PAPER FEEDING MACHINES.
No. 595,768.

Patented Dec. 21, 1897.



WITNESSES:

N. H. Humphrey.
J. Green

INVENTORS
T. C. Dexter
& Charles Ransom,
BY *Knight & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK, AND CLARENCE RANSOM, OF JERSEY CITY, NEW JERSEY; SAID RANSOM ASSIGNOR TO SAID DEXTER.

ELECTRIC CONTROLLING DEVICE FOR PAPER-FEEDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 595,768, dated December 21, 1897.

Application filed September 16, 1896. Serial No. 605,958. (No model.)

To all whom it may concern:

Be it known that we, TALBOT C. DEXTER, residing at Pearl River, Rockland county, New York, and CLARENCE RANSOM, residing at Jersey City, Hudson county, New Jersey, citizens of the United States, have invented certain new and useful Improvements in Electric Registering Devices for Paper-Feeding Machines, of which the following is a specification.

It is common in paper-feeding machines to provide attachments—such, for instance, as the feeding-off fingers—which are automatically controlled by electric make-and-break controlling devices operated by the movement of the sheet of paper passing through the machine. As usually constructed these make-and-break controlling devices consist of a stationary contact-point and a movable contact-arm adapted to be moved for breaking the circuit by the passing of the sheet of paper. The making of the circuit is insured only by the weight of the circuit making and breaking arm which holds it in contact with the stationary point, and as said arm is necessarily constructed to be very light in order to be operated by the pressure of a single sheet of paper much difficulty has been experienced by reason of the vibrations of the machine breaking the circuit, causing the automatic devices to be thrown out of operation at improper intervals.

In view of the above difficulty it is the object of our present invention to provide an automatic electric make-and-break controlling device which will not be influenced or interfered with by the vibrations of the machine. To this end we provide a small receptacle or cup containing a small quantity of mercury, and supported in proper relation to the cup of mercury above the path of the sheet of paper is a movable insulated contact-arm which dips into the mercury for completing a circuit and is constructed to rest upon an insulated block in the path of the paper to be operated by the passing sheet of paper for breaking the circuit.

In order that our invention may be fully understood, we will first describe the same with reference to the accompanying drawings

and afterward point out the novelty with more particularity in the annexed claims.

In said drawings, Figure 1 is a longitudinal sectional view of a paper-feeding machine having our improvements attached. Fig. 2 is an enlarged perspective view of our improved controlling electric make-and-break device. Fig. 3 is a detail sectional view of the same.

1 is the main frame of a feeding-machine, and 2 is a vertically-movable table of the machine, upon which is piled paper P to be fed from the machine. The table is raised automatically by means of the vertical screws 3, working in nuts 4, attached to the table. The mechanism for transmitting motion to the screws is immaterial and is not described.

5 5 represent sheet-buckling devices which are supported above the pile of paper adjacent to the rear corners. These buckling devices are adapted to be operated in any suitable manner for separating the rear edges of the sheets from the remainder of the pile before the feeding-off devices are brought into operation. The sheet-buckling devices are well known in this art, and as those employed in our present machine may be of any of the well-known forms we have not specifically described this part of the mechanism.

Supported at the forward edge or delivery end of the machine are suitable beds 10, having hard-rubber surfaces 11. Over these beds are supported friction-pads 12, which are reciprocated horizontally parallel with the line of feed and movable vertically to and from the bed respectively at the rear and front ends of their horizontal strokes. These pads are formed of soft rubber and are supported at the lower ends of the levers 15, which are pivoted to slides 16, riding on the guides 17, secured by hanger-brackets 18 to the cross-bar 19, fastened to the sides of the main frame 1.

25 is a rock-shaft suitably journaled in the machine-frame and operated in any suitable manner.

26 is a rock-arm keyed to and depending from the shaft 25, and 27 is the paper-feeding finger or feeding-off finger journaled to the lower end of rock-arm 26.

28 is the friction-roll, freely journaled in the

forward bifurcated end of the feeding-finger 27, and 29 is a gear-wheel keyed to the journal 28^a of the roll 23.

30 is a sliding dog or detent sliding in bearing 31 on the arm 27 and having a nose 30^a, which is adapted to be thrown into engagement with the cog-wheel 29.

32 is a spiral spring engaging the arm 27 and the dog 30 and holding the dog 30 normally out of engagement with gear 29 to allow the feed-roll 28 to rotate freely in the arm 27.

35 is a journal-pin secured in the lower end of rock-arm 26, upon which the arm 27 is loosely journaled.

38 is a cam also journaled upon rod 35 and secured to arm 27 to move with it.

36 is a spiral spring engaging the pin 35 at one end and the arm 27 at its other end for affording the necessary downward pressure to the arm 27 and feed-roll 28.

40 is a lever pivoted to arm 26 at one side and provided with a spring 41 for holding it in contact with the cam 38.

42 is a pin adapted to engage the nose of cam 38 when the feeding-finger reaches the end of its forward stroke, thereby elevating the feed-roller 28 from the surface of the paper and causing the spring-pressed lever 40 to engage the notch 38^a of the cam for holding the feed-roller in elevated position until it is again ready to make its forward stroke. When the feeding device reaches the end of its backward stroke, a stop 43 engages the upper end of lever 40 and releases the cam 38, thereby allowing the spring 36 to again throw the arm 27 and feed-roll 28 into lowered position.

45 is an armature-lever pivoted at 46 on one side of rock-arm 26 and pivotally engaging the dog 30 at its lower end 47.

48 is an armature mounted upon the upper end of lever 45.

50 is an electromagnet supported upon a curved arm 49 of the rock-arm 26 in proper relation to the armature 48.

The parts of the feeding mechanism above described are substantially the same as covered by an application of Talbot C. Dexter originally filed September 16, 1896, and allowed to pass to forfeiture, and renewed October 16, 1897, renewal Serial No. 665,480. Such devices are shown and described to better illustrate the application of our improved automatic controlling device; but it will be clear that the construction or arrangement of the feeding devices or other movable attachments of the paper-feeding machine controlled by electric controlling devices is immaterial to our present invention.

60 is a plate, of hard rubber or fiber or other suitable insulating material, extending forwardly from (and represented as formed integrally with) the lower ends of bracket-arms 61 and 62, which depend from the part 17 of the machine-frame.

63 is a small receptacle or cup, formed, preferably, of metal and having a threaded ex-

terior surface which is threaded in the opening formed in the end of the plate 60. The receptacle or cup 63 contains a small quantity of mercury and is provided at its bottom with an adjustable pin or screw 64, which passes through the wall of the receptacle and is in electrical contact with the mercury therein.

Though I have represented plate 60 and bracket-arms 61 and 62 formed in an integral piece of the same material, it is obvious that arms 61 and 62 may be formed of metal with plate 60 secured to them, or all of the parts may be formed of metal and the mercury-cup and circuit making and breaking arm otherwise properly insulated from them.

Operating in conjunction with the mercury-cup just described is a double-armed contact making and breaking lever comprising an arm 65, having a forwardly-bent end 66, which projects into and dips into the mercury in cup 63, and a lower arm 67, having a forwardly-bent end 68, which operates in a longitudinal groove 69 of the block 70, formed of fiber or other insulating material and secured to one edge of the bed 10. The arms 65 and 67 are rigidly attached to a square tubular hub 71, which is preferably filled with an insulating material. The hub 71 is pivotally supported between bracket-arms 61 and 62 by means of the pointed set-screws 72, the ends of said screws being in the insulating material, thereby insulating the arms 65 and 67 from the supports 61 and 62.

73 is a battery, and 74 is an electric circuit.

75 is an adjustable stop-rod formed with a slotted supporting-bracket 76, which is secured to one side of the plate 60 by means of the screw 77. The purpose of the stop 75 is to limit the downward movement of rod 65 and its consequent dip into the mercury in cup 63. The plate 60 is slotted at 60^a to allow for the movement of arm 67.

The operation of the device will be clear with a brief description.

As described in the application above referred to, the rollers journaled in the forward ends of the feeding-fingers are adapted to be held rigidly in said fingers when the circuit of the electric controlling device is closed in order that they will engage a sheet of paper frictionally and push it forward in the machine. When the edge of the sheet of paper comes in contact with the lower curved end of arm 67, said arm is elevated and by its movement elevates the bent end 66 of arm 65 out of contact with the mercury in the cup 63, and thereby breaks the circuit. This breaking of the circuit renders the friction feed-roll free to rotate over the surface of the paper. It will be clear that we design to have two electric controlling devices, such as shown in the accompanying drawings, arranged transversely of the line of feed in the path of the paper, one of said devices being for each of the two sets of feeding devices commonly employed.

The great advantage of our improved electric controlling device lies in the fact that the vibrations of the machine cannot interfere with the electric contact between the arm 65 and mercury in cup 63. In this form of contact the circuit making and breaking arm must necessarily be raised a greater distance than in the ordinary circuit making and breaking device, but by properly curving and shaping the arm 67 there is no difficulty in elevating said arm as far as desired, so long as the weight of the movable arm is kept within a reasonable limit.

We are aware that it is old to construct electric contact devices of a cup of mercury and a movable contact-point; but we are not aware that it has ever been proposed to combine such an electric contact device with an automatically-controlled paper-moving device or attachment of a paper-feeding machine, whereby the constant vibrations of the machine will not interfere with the accurate working of said automatically-controlled paper-moving devices; nor are we aware that a device of the same construction as claimed by us has ever been devised.

We would have it understood that the feeding instrument having means controlled by the advance of the sheet for rendering its frictional hold upon the sheet active or inactive without elevating it from the sheet, as shown but not claimed in our present case, is claimed in the application above referred to of T. C. Dexter, originally filed September 16, 1896, and renewed October 16, 1897, renewal Serial No. 665,480. We would also have it understood that in an application filed by T. C. Dexter November 22, 1897, Serial No. 659,366, he has claimed, broadly, automatically-controlled frictional feeding instruments controlled by the sheet being fed off—such, for instance, as illustrated and described but not claimed in our present case, and in an application filed December 28, 1896, Serial No. 617,263, (out of which said application, Serial

No. 659,366, was divided,) said Dexter has also claimed, broadly, the combination of a frictional retarding-bed arranged at the delivery end of the machine, feeding-off fingers operating above a pile of sheets for feeding the sheets from the pile onto the retarding-bed, and a separator-pad operating alternately with the feeding-off fingers and adapted to engage the front marginal portion of the sheets above the retarding-bed only for separating said sheets from any chance underlyingsheets and feeding them forward from the machine.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, in a paper-feeding machine, of an electrically-controlled paper-feeding device, a double-armed electric contact-lever supported above the path of the paper upon suitable bearings and insulated from its support, one of said arms projecting into the path of the paper to be operated thereby, an insulated block located beneath the path of the paper and supporting said paper-operated arm, and a cup of mercury into which the other of said arms dips, substantially as set forth.

2. The combination, in a paper-feeding machine, of an electrically-controlled paper-feeding device, a double-armed electric contact-lever supported above the path of the paper upon suitable bearings and insulated from its support, a grooved insulated block supported beneath the plane of feed of the paper, one arm of said contact-lever resting in the groove of said block in the path of the paper and adapted to be moved out of the groove by a passing sheet, and a cup of mercury into which the other of said arms dips substantially as set forth.

TALBOT C. DEXTER.
CLARENCE RANSOM.

Witnesses:

WM. H. JOHNSON,
WM. E. KNIGHT.