Feb. 9, 1937. E. S. OSTLER 2,070,310

RECORDING MECHANISM

Filed March 18, 1935 2 Sheets-Sheet 1

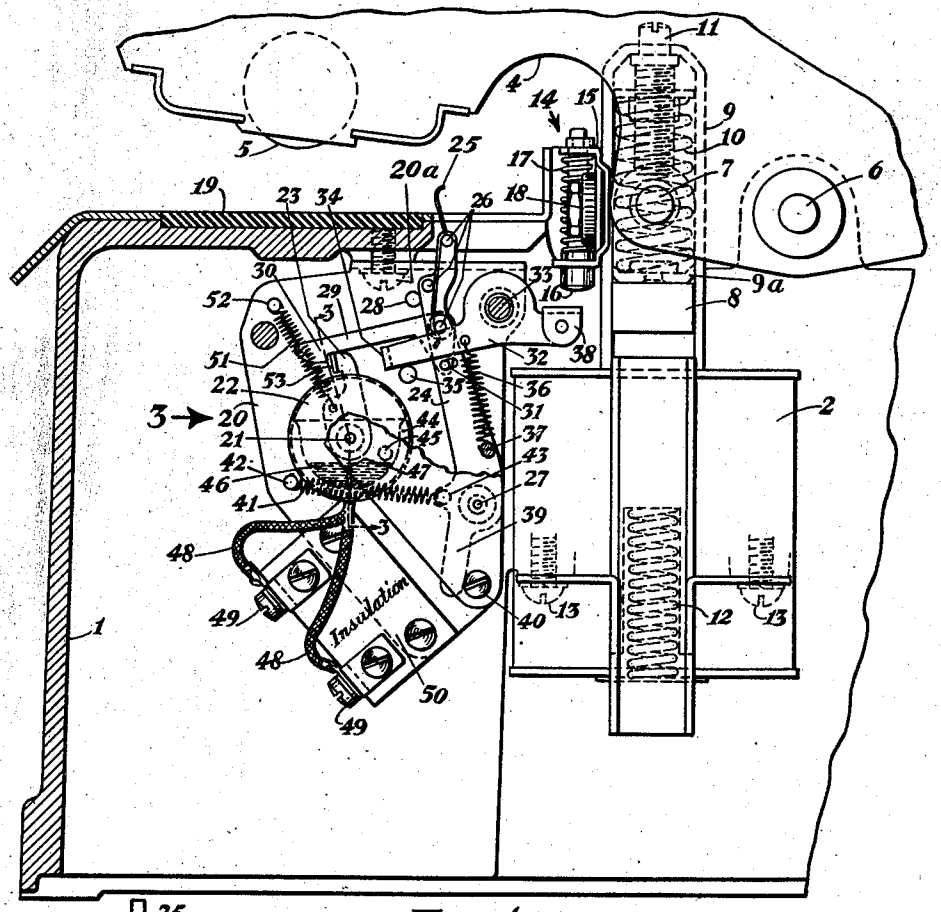



FIG. 1

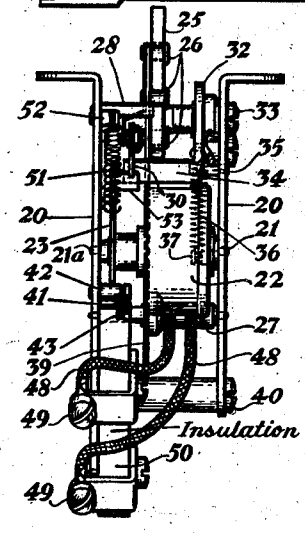



FIG. 2

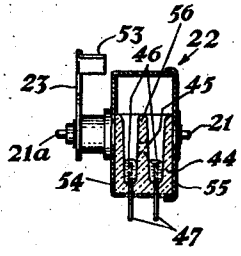


FIG. 3

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RECORDING MECHANISM

Filed March 18, 1935 2 Sheets-Sheet 2

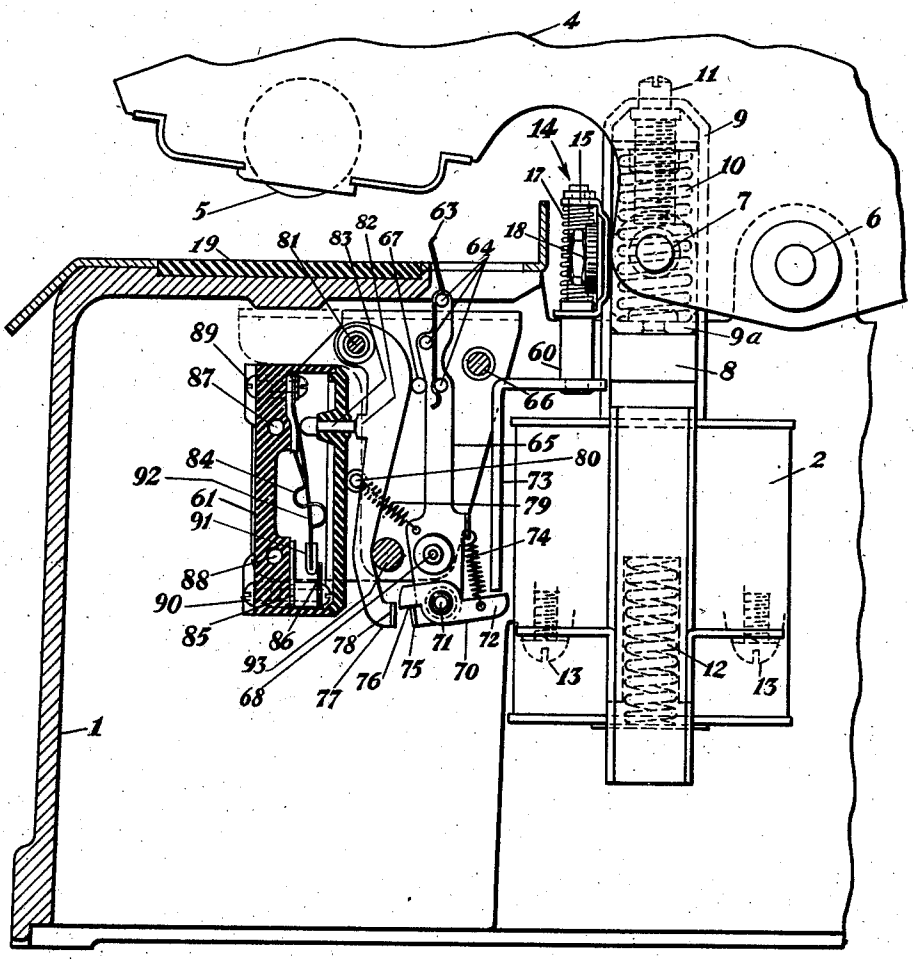



FIG. 4

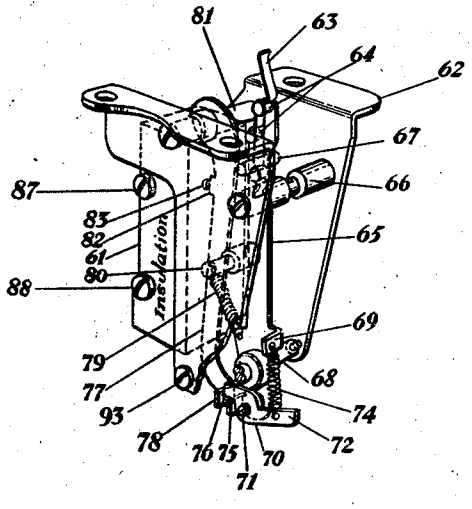



FIG. 5

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Patented Feb. 9, 1937 2,070,310

# UNITED STATES PATENT OFFICE

2,070,310

## RECORDING MECHANISM

Ernest S. Ostler, Park Ridge, Ill., assignor to Stromberg Electric Company, Chicago, Ill., a corporation of Delaware

Application March 18, 1935, Serial No. 11,692

15 Claims. (Cl. 101—297)

The present invention relates in general to recording mechanisms, and more particularly to that class of recording mechanisms in which the printing operation is automatically effected by the insertion of a sheet upon which the imprint is made. The main object of the invention is to provide novel contact arrangements for recording mechanisms of this type.

It will be appreciated by those skilled in the art that a good firm contact is essential for properly closing the electrical circuit to the operating magnet or solenoid of a recorder or printing mechanism in the class to which the present invention relates. It will also be appreciated that the member which is engaged by a sheet of paper on which an imprint is to be made must be easily movable or operable so that the circuit can be completed and the printing operation effected by only a slight pressure with the sheet against the operating member. One of the most important features of the present invention, therefore, relates to the manner in which a firm pressure at the circuit closing contact is obtained by only a slight pressure against the operating member. This enables the printing operation to be effected by the insertion of a single sheet of thin paper into printing position in the recorder.

Another feature of the invention relates to the manner in which the circuit to the operating magnet is opened by the printing operation, and cannot be again closed until the paper has been removed or partially withdrawn, and reinserted.

A feature of one embodiment of the invention lies in a novel mercury contacting device arranged so that the mercury switch may be closed by only a slight pressure on the operating member engaged by the inserted sheet.

Another embodiment of the invention is featured by the use of a leaf spring snap switch and the manner of operating the switch from the operating member by means of compound leverage so that only a slight pressure with the paper against the operating member will effect the operation of the switch.

The above and other objects and features of the invention not specifically mentioned will best be understood from a perusal of the following specification when read in connection with the accompanying drawings, comprising Figures 1 to 5, inclusive, which disclose two embodiments of the present invention and in which—

Figure 1 discloses that portion of a time stamp necessary for a complete understanding of the present invention, including one embodiment of the novel paper-controlled switch or contacting device;

Figure 2 is a side elevation of the contactor 3 of Figure 1 as viewed from the left in Figure 1;

Figure 3 is a partial cross-sectional view of the mercury switch taken along the line 3—3 of Figure 1;

Figure 4 discloses another form of contacting device forming a second embodiment of the invention, the contactor being shown mounted in a time stamp similar to that shown in Figure 1; and

Figure 5 is a perspective view of the contactor of Figure 4.

Referring first to Figures 1 to 3, inclusive, the invention is shown as applied to a time stamp such as is disclosed in my co-pending application, Serial No. 651,243, filed January 11th, 1933. Only sufficient of the general construction of the time stamp has been disclosed in Figure 1 as is necessary for an understanding of the present invention. Reference may be had to my aforementioned application for a complete disclosure and description of one form of time stamp or printing mechanism to which the present invention is applicable.

The time stamp in general comprises a casing 1 which encloses the contact mechanism 3 and the electro-magnet 2 for performing the printing operation. Pivoted on the base casing 1 is the oscillatable stamp head 4 which is arranged to swing on pivot 6. The upward movement of the stamp head is limited by suitable stops (not shown) which are provided on a suitable cover (also not shown) which locks in position on the base casing 1 as is fully disclosed in my above mentioned co-pending application.

The oscillatable stamp head includes the typewheels, indicated at 5, and suitable mechanism for operating the same, which may include a typewheel operating magnet and the necessary ratchet and pawl for driving the typewheels by means of the magnet. The magnet may be operated by impulses from a synchronous motor contacting device within the stamp itself or by impulses from a master or control clock at a remote point.

The printing electro-magnet 2 is mounted in the base casing 1 by means of the mounting screws 13 which securely hold the electro-magnet to lugs provided on the base casing for this purpose. A yielding connection is provided between the plunger of the electro-magnet and the stamp head. This yielding connection is effected by means of a yoke member 9a which has upwardly

extending arms engaging inwardly extending bearing pins 7 on the side frame members 4 of the stamp head, a coil compression spring 10 having its lower end positioned and centered by a rivet secured to the yoke 9a, an adjustable abutment against which the upper end of the spring bears, slidably mounted in guide plates 9 riveted to the plunger of the electro-magnet, and an adjusting screw 11 swiveled on the inwardly extended flanges of the guide plate and having a threaded engagement with the slidable abutment. The plunger of the electro-magnet is normally maintained in its raised position by means of the coil compression spring 12. By adjusting the slidably mounted abutment by means of the screw 11, the force of the stamping blow may be adjusted to any desired value. This adjustment and the detailed construction of the yielding connection between the plunger of the electro-magnet and the stamp head is fully described in my previously referred to application.

The circuit to the printing electro-magnet 2 is controlled by means of the contacting device 3 which is secured to the base casing 1 by means of screws 20a. The contactor comprises two base plates 20 having outwardly extending flanges at their upper ends, thru which the screws 20a are passed to secure the contactor to the casing.

The paper-controlled arm or operating member 24 is pivotally mounted on shaft 27 extending between the two side plates 20. This operating lever is normally held in the position shown by means of coil tension spring 41, one end of which is secured to the pin 42 attached to the left hand side plate 20 (as viewed in Figure 2) and the other end of which is attached to pin 43 mounted on the lever 24. In this normal position of the lever, the upper end thereof engages stop pin 28, and a projection 39 on the lower end of the lever abuts against the post 40 which also serves to hold the two plates 20 in spaced relationship.

The upper end of the operating lever 24 is provided with three headed studs 26 which are engaged by the lower portion of a finger tip 25, the upper end of which projects thru a hole in the upper plate of the base casing in such position that it will be engaged by a sheet of paper which is inserted in the recorder for a printing operation. This finger tip 25 is readily detachable so that other tips of different design may be substituted therefor in order to vary the position of the imprint on the paper.

The electrical circuit to the printing magnet is closed by means of the cylindrical mercury switch 22, a cross-section of which is shown in Figure 3 of the drawings. This switch consists of an open end casing or jacket 54 and a cover 55 which forms an air-tight container for the mercury switch. This container is provided with a semi-cylindrical shaped piece of molded insulation 44 having two wells or chambers each containing a pool of mercury 46. These wells or chambers are separated by a central wall of insulating material 56 provided with a hole 45 which is normally above the level of the mercury and is located to one side of a vertical center line, as shown in Figure 1, so that as the mercury switch is rotated about a central axis, the hole 45 will be lowered to permit the two pools of mercury to come together and close the electrical circuit.

The two terminals 47 extend thru the casing 54 and thru molded insulation 44 into the two recesses or mercury chambers and are in contact with the mercury therein in all positions of the switch. The shaft pins 21 and 21a extend laterally from a central axis of the cylindrical container and mount in bearings in the side plates 20. The operating arm 23 is rigidly attached to the shaft pin 21a and serves as the operating arm for rotating the switch about its central axis. The switch is normally held in the position shown in Figure 1 by means of the coil tension spring 51, one end of which is secured to a pin 52 mounted on the side plate 20 and the other end of which is fastened to the operating arm 23.

Pivotally mounted on the upper end of the paper-controlled operating lever 24 is an oscillatable member 29 terminating in a hook portion 30 which is normally in position to engage the laterally extending projection 53 of the contact operating member 23. The member 29 is normally in the position shown in Figure 1 with the shank portion of the member resting on the projection 53 due to the weight of member 29. A downwardly extending projection of member 29 has a pin and slot connection 31 with lever 24 in order to limit the movement of member 29.

From the structure just described, it will be apparent that when a sheet of paper is inserted in the device the edge of the paper will engage the finger tip 25 and move the lever 24 to the right about its pivotal point 27. The member 29 will therefore be carried to the right and the hook 30 will engage the laterally extending projection 53 on the contact operating lever 23. This rotates the mercury switch 22 about its pivots 21 and 21a in a clockwise direction.

The mercury switch 22 disclosed in Figures 1 to 3, inclusive, of the drawings is especially adaptable to this type of paper-controlled contacting device since very little power need be expended in order to rotate the switch about its axis. The advantage of the disclosed switch over the usual type of mercury switch is that the mercury in the switch need not be raised against the force of gravity since it remains in the bottom of the chambers while the switch rotates, and the only force required to rotate the switch is that which is necessary to overcome the friction at the pivot points and the tension of spring 51, which is made relatively weak since all that is required of this spring is to rotate the mercury switch to its normal position when it is released after the printing operation.

As the switch 22 is rotated in a clockwise direction, the hole 45 in the center wall or partition 56 which normally separates the two pools of mercury 46 is lowered until it is below the level of the mercury and permits the two pools of mercury to come together thru the hole and complete the circuit to the printing magnet 2. As is well known, the closing of a circuit thru a mercury switch is highly satisfactory in that a good low resistance contact is made as soon as the two portions of mercury come together. The circuit to the electro-magnet 2 is closed thru the mercury, the two terminals 47 which are in contact with the two portions of mercury at all times, the leads 48 connecting terminals 47 to the terminals 49, which are mounted on a block of insulating material 50 secured to the side plates 20 of the contacting device. The terminals 49 are connected by suitable leads (not shown) to the terminals of the magnet core, thru a suitable source of current.

When the printing magnet is energized due to the closing of the electric circuit by the insertion of the sheet of paper to be printed as described above, the plunger is drawn into the magnet and the stamp head containing the type-

wheels 5 is brought down sharply for the printing blow. The manner in which the circuit to the printing magnet is opened during the printing operation irrespective of whether the sheet of paper is withdrawn or whether it remains in engagement with the finger tip 25 and maintains the lever 24 in its right hand position, will now be explained.

A rock arm is pivotally mounted on shaft 33 extending between the two side plates 20. This shaft also serves as a spacing pin for the two plates to maintain them in spaced relationship. One end of the rock lever 32 terminates in a laterally extending projection 34 which normally lies below the shank of member 29. Mounted on the other end of the rock lever 32 is an anvil or shock plate 38 which lies directly below the contact opening mechanism 14 which in turn is mounted on one of the side members 9 connected to the plunger of the printing magnet. The rock lever 32 is normally maintained in the position shown in Figure 1 with its left hand arm in engagement with the stop pin 35 by means of a coiled tension spring 36 having one end connected to the rock lever 32 and its other end connected to the pin 37 on the side plate 20.

The switch opening mechanism 14 is arranged so that the time of opening of the switch with respect to the printing operation may be adjusted to vary the amount of energy furnished to the stamp head actuating magnet and thereby vary the vividness of the imprint. This construction comprises the yielding plunger 16 mounted for sliding movement in a bracket 15 secured to the side member 9 of the plunger. The plunger 16 lies directly above the anvil 38 on the rock lever 32 and is slidably mounted in the wings of the bracket and normally held in its lowermost position by means of the coil compression spring 17 the lower end of which engages a shoulder on the plunger 16 the upper end of which is in engagement with the upper wing of the mounting bracket. The bracket itself is adjustably mounted on the guide member 9 and its adjustment is effected by means of an eccentric and associated mechanism indicated generally at 18 and which is fully disclosed in my previously mentioned copending application.

As the stamp head is brought down by the energization of the printing magnet as previously explained, the plunger 16 strikes the anvil 38 on rock lever 32 and swings this lever about its pivot point 33. The laterally extending projection 34 on the rock lever abuts against the member 29 and raises it, thereby disengaging the hook 30 from the shoulder 53 on the contact operating arm 23. When released in this manner, the mercury switch 22 is rotated in a counterclockwise direction by means of coil tension spring 51 to its normal position, thereby raising the hole 45 above the level of the mercury and breaking the electric circuit to the printing magnet at this point. The circuit is made and broken between two portions of the mercury and this eliminates the pitting and burning of contacts and the accompanying deterioration thereof which is usually present when an electric circuit is made and broken between two metallic contacts or between one metallic contact and mercury. As previously explained, the member 29 has a pin and slot connection with lever 24 at 31 and its movement is thereby limited when it is thrown upward by the rock lever 32.

As soon as the circuit to the printing magnet is broken as explained above, the magnet deenergizes and the stamp head returns to its normal position as shown in Figure 1 of the drawings. The rock lever 32 is thereby released and returned to its position against stop pin 35 by the action of coil tension spring 36. This allows the member 29 to drop by gravity. In case the paper has not been withdrawn from the stamp and the lever 24 is still in its right hand position, the hooked portion 30 will come to rest on shoulder 53 with the shoulder engaging surface of the hook to the right of the edge of shoulder 53. Thus any slight movement of the paper which might oscillate the lever 24 back and forth will not cause a repeated printing operation since the hooking edge of hook 30 is not in engagement with shoulder 53. Thus it is seen that only one operation will result from a single insertion of a sheet of paper into the stamp. When the sheet of paper is withdrawn, the paper controlled lever 24 is returned to its normal position as shown in the drawings by means of the coil tension spring 41 with its lower projection 39 against post 40 and the upper end of the lever resting against the stop pin 28. The lever 29 is thereby moved to the left and the engaging edge of hook 30 drops over the shoulder 53 on contact operating lever 23 in readiness for operating the mercury switch when a sheet of paper is again inserted in the stamp.

It will be apparent from the foregoing, that only a very slight pressure by the edge of the paper against the finger tip 25 is required to effect the closing of the circuit to the printing magnet since, with the form of mercury switch shown, there are no parts which need to be raised against the force of gravity and the only energy which need be expended is to rotate the mercury switch about its pivot points 21 and 21a. In this way, the circuit may be closed and the printing operation may be effected by a single sheet of paper inserted in the stamp irrespective of its stiffness.

Referring now to Figures 4 and 5 of the drawings, the embodiment of the invention disclosed therein makes use of a leaf spring snap switch such as is disclosed in Patent No. 1,960,020 issued May 22nd, 1934, to P. K. McGall. The time stamp to which the contacting device is applied is similar to that disclosed in Figure 1 of the drawings and like reference numerals have been applied to corresponding parts so that it is thought unnecessary to again explain these parts in detail. The contacting device in this embodiment comprises two parallel plates 62 held in spaced relation by means of shafts or spacing posts 66, 81, and 69. The snap switch 61, which may be similar in all respects to the embodiment disclosed in Figure 1 of the above mentioned patent to McGall, is mounted on a side plate 62 by means of mounting screws 87 and 88.

As clearly disclosed in the above mentioned patent, the snap switch consists essentially of a container of insulating material 61 having mounted therein a contact arm 92 secured at one end so that its free end moves between two stops, one of insulating material 86 and the other of contact material 85. This contact arm comprises a thin leaf spring supported at one end in cantilever fashion in combination with adjacent parallel compression spring means 84 attached to the free end of the contact arm at 91. The other end of the compressed spring means is pivoted at a point adjacent to the contact arm near its fixed end and the parts are so arranged that the free end of the leaf spring will move with a snap action when pressure is applied to it by the plunger 83

near its point of support. When the pressure is relieved the free end of the leaf spring snaps back into its normal position against the insulating stop 86.

Connections to the snap switch are made by means of the terminal 89 which is in electrical contact with the fixed end of contact arm 92 and the terminal 90 which is in electrical contact with the contact plate 85. One of the incoming power leads is connected to the other terminal of the electromagnet so that when the snap switch is operated, the circuit to the electromagnet will be closed to effect the printing operation.

A paper-controlled operating lever 65 is pivotally mounted on shaft 68 and is provided with a finger tip 63 held in place on the lever by means of the retaining pins 64 in the same manner as shown in Figure 1 of the drawings. The operating lever 65 is normally retained in the position shown against the stop pin 67 by means of a coil tension spring 79 secured to the lever near its pivot point and having its other end secured to a pin 80 on the side plate 62. Spring 79 is made relatively weak and its line of action is near the pivot point of the lever 65 so that very little force is required to move the lever 65 to its right hand position and yet the spring has sufficient power to restore the lever 65 when the sheet of paper is removed. Mounted on an extension of the lever 65 is a rock member 70 pivoted at 71 and normally held in the position shown with its extension 76 resting on the laterally extending projection 75, which is a part of lever 65, by means of a coil tension spring 74 having one end secured to the arm 72 of member 70 and having its other end secured to the laterally extending projection 69 of lever 65.

The operating arm 76 of the rock member 70 is retained against projection 75 by spring 74 in a position so that the end of the arm will abut against the laterally extending projection 78 of the plunger operating lever 77 which is pivotally mounted on shaft 81 and normally held against the post or pin 93 by the engagement of plunger 83 against the abutting surface 82 on the lever 77. The lever 77 is free and the force exerted by the leaf spring contact arm 92 of the snap switch 61 which keeps the plunger 83 in its right hand position is sufficient to maintain lever 77 against the stop pin 93.

When a sheet of paper is inserted in the stamp, the edge of the sheet engages the finger tip 63 and the lever 65 is moved to the right about its pivot point 68. The spacing post or pin 66 serves as a stop for lever 65 to limit this movement. As the upper end of the lever moves to the right, the lower extension thereof moves to the left and carries the lever operating arm 76 of rock member 70 against the projection 78 thereby moving lever 77 to the left about its pivot point 81. The abutting projection 82 moves the operating plunger 83 to the left thereby depressing the contact arm leaf spring 92 at its point of engagement therewith and causing a snap action of this contact arm to carry the contact 91 into engagement with the contact stop 85. This completes the electrical circuit to the printing magnet 2 which energizes and draws down the stamp head 4 for the printing operation.

The contact opening mechanism 14 is practically the same as that disclosed in Figure 1 and described in connection therewith with the exception that the slidably mounted plunger 60 has secured to its lower end an angle lever 73 the lower end of which is positioned directly above the arm 72 of rock member 70. At the proper time in the downward movement of the stamp head, as determined by the adjustment of the eccentric 18 as explained in connection with Figure 1, the lower end of the angle lever 73 engages the arm 72 and rotates rock member 70 about its pivot point 71. The operating arm 76 is thereby raised and disengaged from the projection 78 on the plunger operating lever 77. This allows the contact arm 92 to snap back to its normal position with contact 91 in engagement with the insulated stop 86 thereby opening the circuit to the printing magnet and allowing the stamp head to return to its normal position. This movement of the contact arm 92 moves the plunger 83 to the right and returns the plunger operating lever 77 to its normal position in engagement with the stop pin 93. Since the operating arm 76 of the rock member 70 is raised to disengage it from the projection 78, the movement of lever 77 to the right causes the projection 78 to pass underneath the operating arm 76 so that any slight movement of the lever 65 caused by the shifting of the paper will not cause repeated operation of the stamp head. It is not until the paper has been completely withdrawn so that lever 65 can assume its normal position against stop pin 67 that the operating arm 76 again clears the projection 78 so that it can be returned by means of spring 74 to its engagement with the projection 75 and in position to again move the lever 77 to the left when a sheet of paper to be printed is again inserted in the stamp.

When the circuit to the printing magnet is opened in the above manner, the stamp head returns to its normally raised position, the angle lever 73 being moved with the plunger of the magnet and freeing arm 72 to allow the rock member 70 to be restored to its normal position.

The easy operation of the paper-controlled lever 65 in this modification of the invention is accomplished by the compound leverage which has been described. This is possible since the movement of the operating plunger 83 required to cause the contact arm to snap from one position to the other is very small and therefore the distance from the pivot point of each lever to the point at which it accomplishes its work can be made small in comparison to the distance from the pivot point of the lever to the point where the force is applied thereto. In this manner, the force supplied to the finger tip 63 by the edge of the paper can be greatly increased by means of the levers to operate plunger 83 and thereby cause the operation of the snap switch. Thus, the circuit to the printing magnet can be closed by the insertion of a single sheet of thin paper into printing position in stamp, and yet a good firm contact is obtained at the circuit closing point which is impossible in a case where the sheet of paper directly engages the contact and the pressure between the closed contacts is less than the pressure exerted by the paper.

Having described the invention, what is new and is desired to have secured by Letters Patent is:

1. In a printing device, an electrical circuit including means for effecting a printing operation, a single pair of contacts in said circuit continually biased to open-circuit position, means for closing said contacts to effect a printing operation responsive to the insertion of a sheet into printing position in said device, said means including a sheet-controlled member engaged by the edge of the sheet and operated thereby, and means

effective during the printing operation for allowing said contacts to reassume open-circuit position irrespective of the position of said sheet-controlled member.

2. In a printing device, electrical means for effecting a printing operation, circuit-closing means for controlling said electrical means, said circuit closing means biased to open-circuit position, an operable member engaged by the edge of a sheet inserted in said device, and a system of levers connecting said member and said circuit-closing means, said levers being compounded so that a relatively large force is available to operate said circuit-closing means with only a slight pressure against said member with the edge of the sheet.

3. In a printing device, electrical means for effecting a printing operation, circuit-closing means for controlling said electrical means, said circuit-closing means biased to open-circuit position, an operable member engaged by the edge of a sheet inserted in said device, a system of levers connecting said member and said circuit-closing means, said levers being compounded so that a relatively large force is available to operate said circuit-closing means with only a slight pressure against said member with the edge of the sheet, and means for interrupting the connection between said member and said circuit-closing means during the printing operation to allow the latter to return to open-circuit position.

4. A printing construction comprising printing means, electromagnetic means for effecting the printing operation, a circuit for said electromagnetic means, and means for closing said circuit by the insertion of a sheet into printing position comprising a sheet-controlled lever, a second lever pivotally mounted thereon, and normally open circuit-closing means including a member engaged by said second lever and operated thereby to effect the closing of said circuit responsive to the operation of said first lever by the insertion of a sheet.

5. A printing construction comprising printing means, electric power means for effecting a printing operation, a circuit for said electric power means, circuit-closing means biased to open-circuit position, a sheet-controlled lever, a second lever mounted thereon having means for engaging and operating said circuit-closing means when said sheet-controlled lever is operated by the insertion of a sheet into printing position, and means responsive to the printing operation for disengaging said second lever from said circuit-closing means to allow the latter to return to normal open-circuit position.

6. A printing construction comprising printing means, electromagnetic means for effecting the printing operation, a circuit for said electromagnetic means, and means for closing said circuit by the insertion of a sheet into printing position comprising a sheet-controlled lever, a second lever pivotally mounted thereon, normally open circuit-closing means including a member engaged by said second lever and operated thereby to effect the closing of said circuit responsive to the operation of said first lever by the insertion of a sheet, and means for disengaging said second lever from said circuit-closing member during the printing operation to allow said circuit-closing means to return to normal open position.

7. A printing construction comprising a type element and a platen element, electromagnetic means for effecting relative movement between said elements for a printing operation, an electric circuit for said electromagnetic means, contacts in said circuit, a contact operating member, a sheet-controlled lever operated by a sheet inserted in printing position, a rock lever mounted on said sheet-controlled lever and adapted to engage said contact operating member, movement of said sheet-controlled lever being transmitted thru said rock lever and said contact operating member to close the circuit thru said contacts, and means responsive to the printing operation for disengaging said rock lever from said contact operating member to permit the circuit to be opened at said contacts irrespective of continued pressure by the sheet against said sheet-controlled lever.

8. A printing construction comprising printing means, an electro-magnet for effecting the printing operation, a circuit for said electromagnet, a cylindrical-shaped mercury switch mounted for rotation about its longitudinal axis, a sheet-controlled lever, and a second lever mounted on said sheet-controlled lever and adapted to engage said mercury switch to rotate the same about its axis and thereby effect closure of said circuit when said sheet-controlled lever is operated by a sheet inserted into printing position.

9. A printing construction comprising printing means, an electro-magnet for effecting the printing operation, a circuit for said electromagnet, a cylindrical-shaped mercury switch mounted for rotation about its longitudinal axis and retained in normal open-circuit position by a spring, a sheet-controlled lever, a second lever pivotally mounted on said sheet-controlled lever and adapted to engage said mercury switch and rotate the same to effect closure of said circuit when said sheet-controlled lever is operated by the insertion of a sheet into printing position, and means for automatically disengaging said second lever from said switch during the printing operation to allow said switch to be returned to normal open-circuit position by said spring.

10. A printing device comprising printing means, electric power means for effecting a printing operation, a rotatable drum-shaped mercury switch included in the circuit of said electric power means, a series of levers including a finger engaged by a sheet inserted into printing position in said device for rotating said switch to effect closure of said circuit, and means responsive to the resulting printing operation for disengaging one lever of said series to allow said switch to return to normal open-circuit position irrespective of the position of said finger.

11. In a printing device, the combination of printing means, electric power means for effecting a printing operation, a leaf-spring snap switch included in the circuit of said electric power means, a plunger for operating said switch, a member engaged by a sheet when inserted into printing position in said device, a system of levers for transmitting the movement of said member to said plunger to operate said switch, thereby closing said circuit to effect the printing operation.

12. In a printing device, the combination of printing means, electric power means for effecting a printing operation, a leaf-spring snap switch included in the circuit of said electric power means, a plunger for operating said switch, a member engaged by a sheet when inserted into printing position in said device, a system of levers for transmitting the movement of said member

to said plunger to operate said switch, thereby closing said circuit to effect the printing operation, and means effective during said printing operation for disengaging one of said levers to permit said switch to restore to open position irrespective of sheet position.

13. In a printing device, printing means, electric power means for effecting a printing operation, a snap switch included in the circuit of said electric power means, a plunger for operating said switch, a finger engaged by a sheet inserted in said device, and a system of compound leverage for transmitting movement of said finger to said plunger whereby said switch is operable to effect a printing operation by a slight pressure against said finger with the inserted sheet.

14. In a printing device, printing means, electric power means for effecting a printing operation, circuit-closing means for completing a circuit to said power means, a finger engaged by a sheet inserted in said device, and a system of levers for transmitting movement of said finger to said circuit-closing means, said levers being compounded so that a relatively large force is effective at said circuit-closing means by the application of a relatively slight pressure against said finger with the edge of the inserted sheet.

15. In a printing device, electrical means for effecting a printing operation including a pair of contacts biased to open position, a finger engaged by the edge of a sheet inserted into printing position in said device, a system of levers for transmitting movement of said finger to said contacts to effect a closure thereof, said levers being compounded so that a slight pressure against said finger with the edge of the inserted sheet causes a relatively large pressure at said contacts to close the same, and means responsive to the resulting printing operation for disengaging one of said levers to allow said contacts to open.

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