Feb. 3, 1959 W. STARK 2,871,711

LOOSE LEAF BINDER MECHANISMS

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FIG. 1

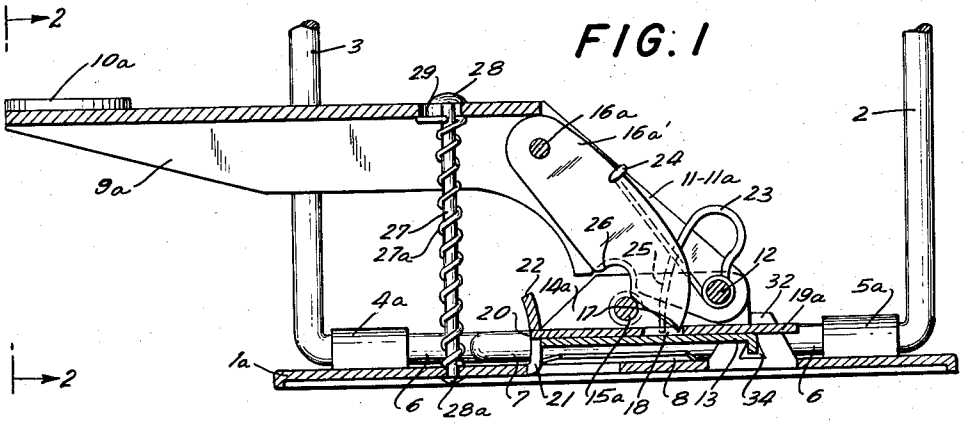


FIG. 2

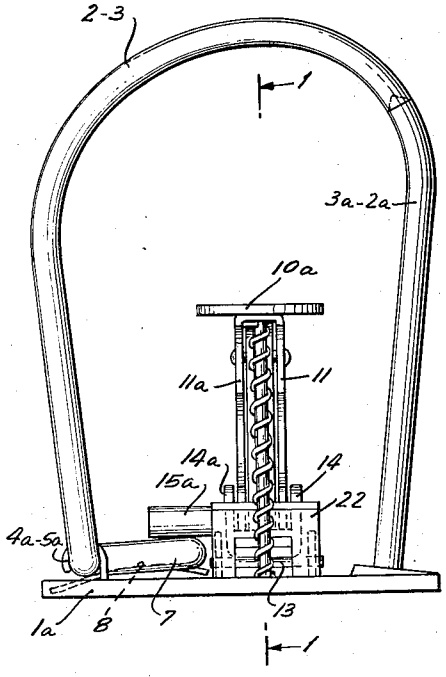
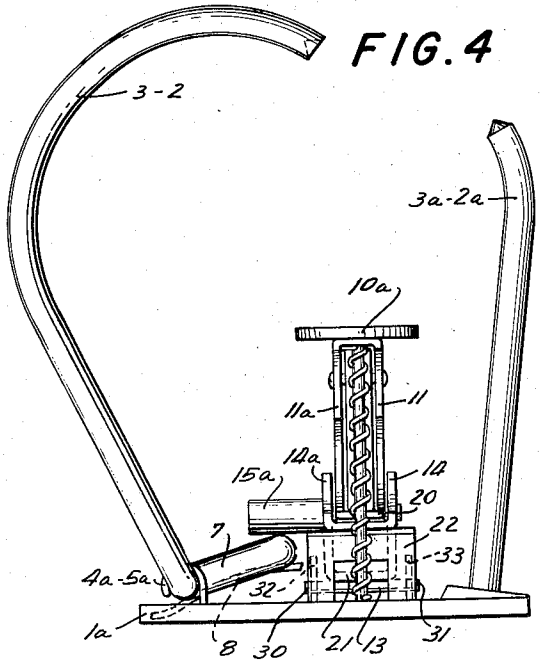


FIG. 4



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LOOSE LEAF BINDER MECHANISMS

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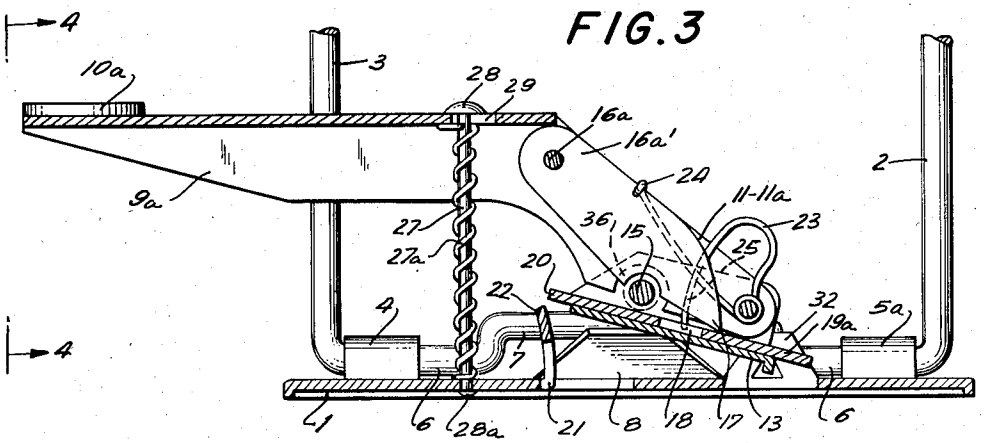
FIG. 3



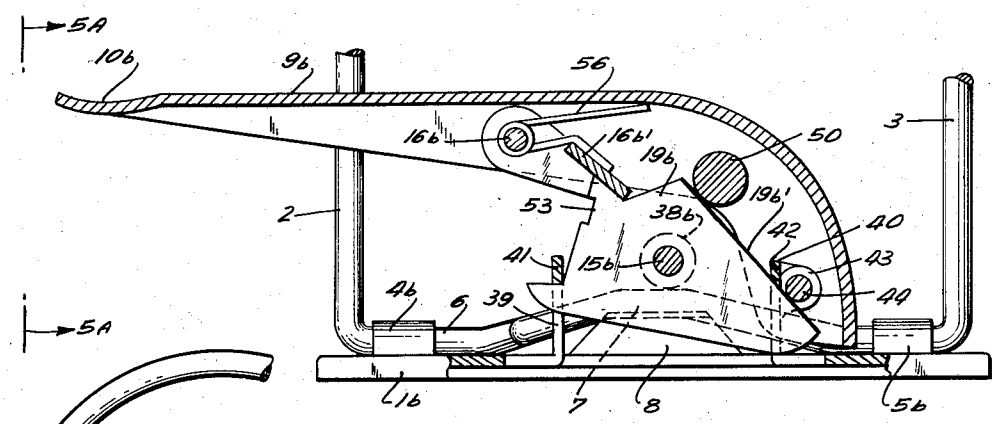


FIG. 5

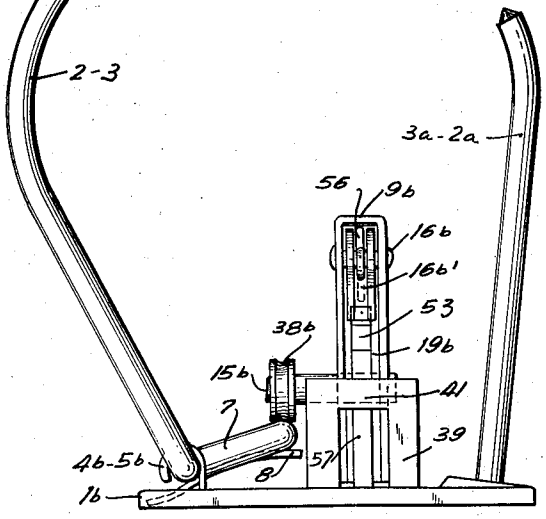


FIG. 5A

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LOOSE LEAF BINDER MECHANISMS

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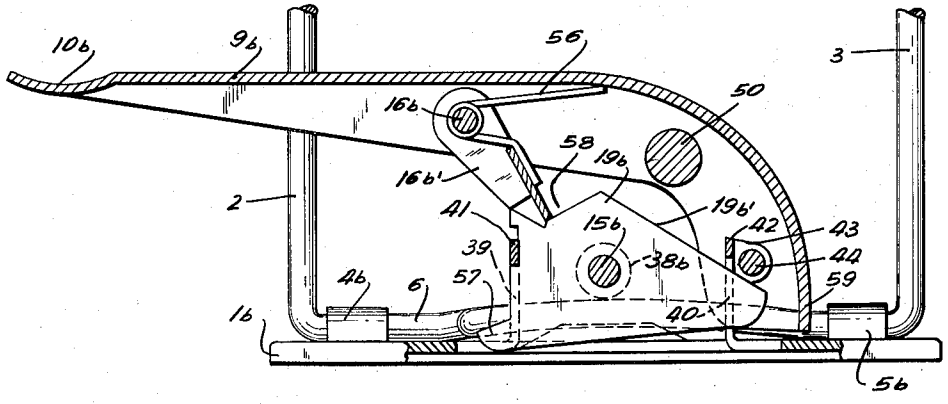
FIG. 6



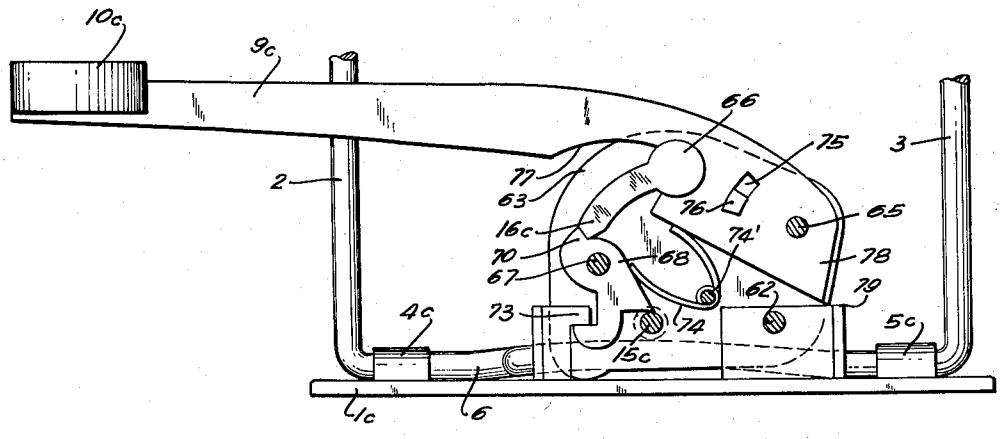


FIG. 7

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LOOSE LEAF BINDER MECHANISMS

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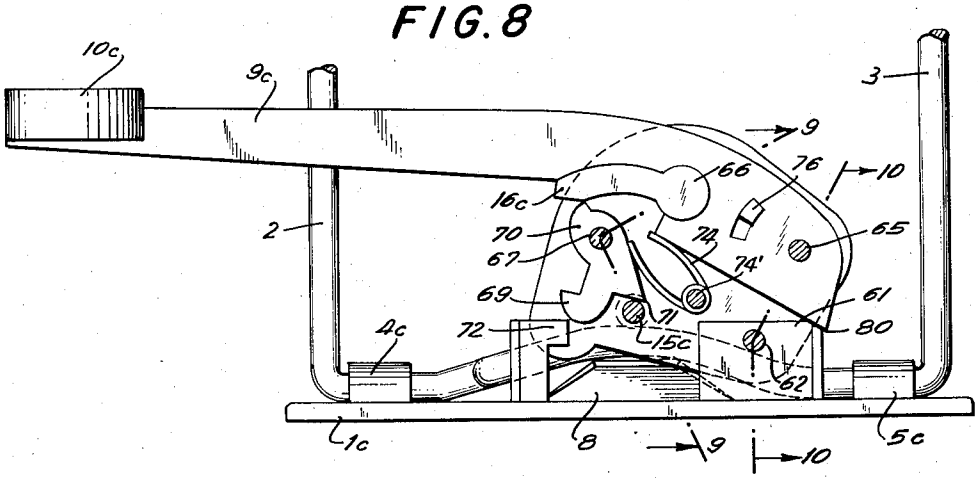
FIG. 8



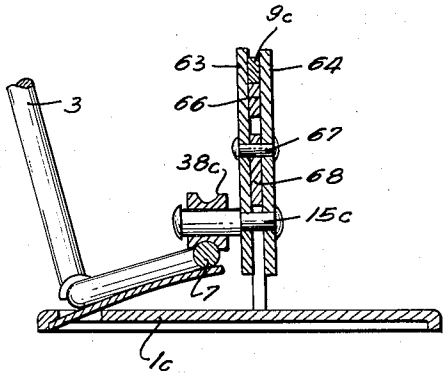


FIG. 9

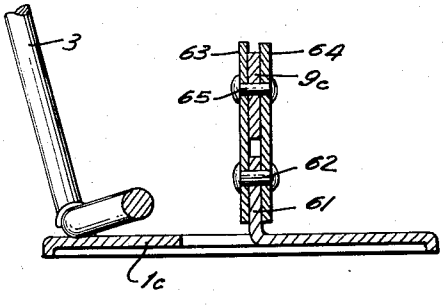


FIG. 10

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United States Patent Office 2,871,711 Patented Feb. 3, 1959

2,871,711

LOOSE LEAF BINDER MECHANISMS

Walter Stark, Bonn (Rhine), Germany, assignor to F. Soennecken, Bonn (Rhine), Germany

Application January 29, 1954, Serial No. 407,059

Claims priority, application Germany February 3, 1953

20 Claims. (Cl. 74—97)

The present invention relates to loose leaf binder mechanisms which are adapted to releasably hold together a plurality of sheets in a predetermined order.

Loose leaf binder mechanisms of this type are already known, but they possess certain disadvantages. Thus, when the binder is substantially filled with sheets, the loose leaf mechanism for releasing the sheets and for maintaining the same in the desired order is exceedingly difficult to operate because the many sheets provide an extremely small space for the loose leaf binder mechanism. One of the principal difficulties of this known mechanism arises from the fact that the mechanism is operated by a lever which moves downwardly during the closing of the mechanism and upwardly during the opening of the mechanism, and the small space provided by the sheets of paper or the like makes it extremely difficult for the operator to place a finger beneath the operating lever to raise the same. Furthermore, with the known loose leaf binder mechanisms, it is almost always necessary for the operator to hold the sheets with one hand while operating the mechanism with the other hand to close the same, where the mechanism is substantially filled with sheets, so that this known mechanism cannot be operated with one hand at all times.

One of the objects of the present invention is to overcome the above drawbacks by providing a loose leaf binder mechanism which may be conveniently and easily operated irrespective of the number of sheets held by the mechanism.

A further object of the present invention is to provide a loose leaf binder mechanism which may be opened and closed by moving an operating lever in only one direction for both the opening and closing of the mechanism.

Another object of the present invention is to provide a loose leaf binder mechanism which is made up of a relatively small number of simple and ruggedly constructed parts which provide a very reliable operation over a long period of time.

An additional object of the present invention is to provide a loose leaf binder mechanism whose moving parts are all covered by other parts of the mechanism so that the possibility of faulty operation is reduced to a minimum.

With the above objects in view, the above invention mainly consists of a loose leaf binder mechanism which includes a base plate means having a pair of stationary pin portions fixed thereto and extending therefrom. An elongated member having a pair of movable pin portions respectively extending from opposite ends thereof is turnably carried by and extends along the base plate means for moving, during turning of the elongated member, the movable pin portions between a closed position, where free ends of the movable pin portions respectively engage free ends of the stationary pin portions and form closed loops therewith, and an open position where the movable pin portions are spaced from the stationary pin portions, this elongated member having an offset crank portion located between its ends. A first spring engages

the crank portion of the elongated member for urging the movable pin portions to the open position thereof. A stationary lock member is fixed to the base plate means. A movable lock means for holding the movable pin portions in the closed position thereof when the movable lock means is in a locked position thereof engages the crank portion to move the same and to be moved thereby, this movable lock means having a locking portion engaging the stationary lock member when the movable lock means is in its locked position. A manually operable lever is turnably carried by one of the above mentioned means for turning movement from a rest position through a predetermined distance with respect to and into abutment with the movable lock means for moving the latter, after abutment therewith, to the locked position thereof so as to simultaneously move the crank portion through the movable lock means against the action of the first spring during movement of the movable pin portions to the closed position thereof. A second spring engages the lever for urging the latter to the rest position thereof, and a pawl means is turnably carried by the lever and engages the movable lock means for moving the locking portion thereof out of engagement with the stationary lock member to release the movable lock means and the elongated member carrying the movable pin portions to the influence of the first spring to move the movable pin portions from the closed to the open position thereof, so that the latter is moved in only one direction during both opening and closing of the loose leaf binder mechanism.

The novel features which are considered characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary, partly sectional, side elevational view of one loose leaf binder mechanism constructed in accordance with the present invention, the mechanism of Fig. 1 being shown in its closed position;

Fig. 2 is a view of the structure of Fig. 1 as seen from the left end thereof;

Fig. 3 is a view corresponding to Fig. 1 but showing the parts in the open position of the loose leaf binder mechanism;

Fig. 4 is a view corresponding to Fig. 2 but showing the mechanism in the open position thereof;

Fig. 5 is a fragmentary, partly sectional, side elevational view of a second embodiment of a loose leaf binder constructed in accordance with the present invention and showing this embodiment in its open position;

Fig. 5*a* is a view of the structure of Fig. 5 as seen from the left end thereof;

Fig. 6 shows the structure of Fig. 5 in the closed position of the loose leaf binder mechanism;

Fig. 7 is a fragmentary side elevational view of a third embodiment of a loose leaf binder mechanism constructed in accordance with the present invention, the mechanism of Fig. 7 being shown in its closed position and one of the plates of the mechanism of Fig. 7 being omitted from Fig. 7 to show the elements located behind this plate;

Fig. 8 shows the structure of Fig. 7 in its open position;

Fig. 9 is a sectional view taken along line 9—9 of Fig. 8 in the direction of the arrows; and

Fig. 10 is a sectional view taken along line 10—10 of Fig. 8 in the direction of the arrows.

Referring now to the drawing, and to Figures 1 to 4 in particular, it will be seen that the embodiment of the invention illustrated in Figures 1 to 4 includes a base plate 1*a* provided with upwardly struck curved tongues

4*a* and 5*a* which turnably guide an elongated member 6 which extends along the base plate 1*a* and which has at its opposite ends, respectively, a pair of movable pin portions 2 and 3 which turn together with the elongated member 6, this elongated member 6 being integral with pin portions 2 and 3 and having between its ends an offset crank portion 7 which is engaged by a leaf spring 8 fixed to the base plate 1*a*, this leaf spring tending to turn the elongated member 6 and the movable pin portions 2 and 3 in a counter-clockwise direction, as viewed in Figures 2 and 4, from the closed position shown in Figure 2 to the open position shown in Figure 4. A pair of stationary pin portions 2*a* and 3*a* are fixed to and extend from the base plate 1*a* and have free ends, respectively, engaged by free ends of the movable pin portions 2 and 3 when the loose leaf binder mechanism is in its closed position, as shown in Figure 2, the movable pin portions 2 and 3 being spaced from the stationary pin portions 2*a* and 3*a* when the loose leaf binder mechanism is in its open position shown in Figure 4.

A manually operable lever 9*a* is provided for actuating the mechanism, and this lever 9*a* has at its outer left free end portion, as viewed in Figures 1 and 3, a finger piece 10*a* which is engaged by the operator to depress the lever 9*a*. As is evident from Figures 1 and 3, the lever 9*a* is bifurcated and has a pair of side walls 11 and 11*a* which are pivotally connected by a pivot pin 12 to a carrier 13 of U-shaped cross-section, this carrier 13 having a pair of side walls 14 and 14*a* between which the pivot pin 12 extends and between which the side walls 11 and 11*a* of lever 9*a* are located. Moreover, the side walls 14 and 14*a* of carrier 13 carry a pin 15*a* extending through aligned openings in the side walls and fixed thereto in any well known manner. Pin 15*a* extends outwardly beyond wall 14*a* and engages the crank portion 7 of the elongated member 6, as shown in Figures 2 and 4.

The side walls 11 and 11*a* of lever 9*a* carry a pivot pin 16*a* which pivotally supports a pawl 16*a'* located between the side walls 11 and 11*a* of lever 9*a* and having a free end 17 which cooperates with an opening 18 formed in a movable lock member 19*a* formed from a flat strip of metal and slidably carried by the carrier 13 between the side walls 14 and 14*a* thereof. The lock member 19*a* has an end portion 20 which in the closed position of the loose leaf binder mechanism extends into an opening 21 formed in a stationary lock member 22 which forms a tongue struck upwardly from the base plate 1*a*. It will be noted that the stationary lock member 22 is curved. A wire spring 23 is fixed intermediate its ends to the pivot pin 12 and has an end 24 in engagement with the pawl 16*a'* to urge the latter toward the lock member 19*a*, while the opposite end 25 of spring 23 is fixed to the movable lock member 19*a* to urge the latter to the left, as viewed in Figures 1 and 3, toward the stationary lock member 22.

The carrier 13 is provided at the right end thereof, as viewed in Figs. 1 and 3, at a portion extending beyond the side walls thereof with portions 30 and 31 which extend outwardly beyond the side walls and through openings, respectively, formed, respectively, in a pair of ears 32 and 33 struck upwardly from the base plate 1*a* so that the carrier 13 is turnable in holes 34 of ears 32 and 33 about the horizontal axis extending through the portions 30 and 31 of of carrier 13.

A pin 27 is fixed to and extends upwardly from the base plate 1*a* through an opening 29 formed in the lever 9*a*, this pin 27 having a head 28 at its top end which engages the lever 9*a* to limit the turning movement thereof in a clockwise direction, as viewed in Figures 1 and 3, the left free end portion of lever 9*a*, as viewed in Figures 1 and 3, extending in a substantially horizontal direction where it is substantially parallel to the base plate 1*a* when the lever 9*a* is in its rest position in engagement with the head 28 of pin 27. A coil spring 27*a* surrounds the pin 27, abuts with its bottom end against the base plate 1*a*, and abuts with its top end against the lever 9*a* to urge the latter to its rest position against the head 28.

The above described structure operates in the following manner:

The parts 13, 15*a*, and 19*a* form a movable lock means which cooperates with the stationary lock member 22 to hold the loose leaf binder mechanism in its closed position against the action of spring 8, and the pawl means 16*a'* cooperates with this movable lock means to release the latter from the stationary lock member 22 so that the movable pin portions 2 and 3 are released to the influence of the spring 8 to be moved thereby to the open position of the mechanism shown in Figures 3 and 4. Assuming that the parts are in the closed position shown in Figures 1 and 2, the operator presses downwardly on finger piece 10*a* to turn the lever 9*a* in a counter-clockwise direction about pivot point 12, as viewed in Figure 1, so that the pawl means 16*a'* moves downwardly. In this way, the pawl 16*a'* turns with respect to the lever 9*a* since the end 17 of the pawl is in the opening 18 of the movable lock member 19. Thus, the depression of lever 9*a* causes the pawl 16*a'* to move the lock member 19*a* against the action of spring 23 to the right, as viewed in Figure 1, until the end 20 of lock member 19*a* is out of engagement with the stationary lock member 22, and then the spring 8 turns the crank portion 7 in a counter-clockwise direction, as viewed in Figure 2, and this crank portion 7 through its engagement with the pin 15*a*, turns the carrier 13 upwardly in a clockwise direction, as viewed in Figure 1. It will be noted that the pin 15*a* thus becomes located in a cut-out 26 formed in the pawl 16*a'* as is shown particularly in Figure 3. During downward movement of lever 9*a* from the position of Fig. 1 the pin 15*a* comes into contact with the edge of cutout 26 before the pin 15*a* engages the edge of the cutouts 36. The spring 8 acts through the crank portion 7 and pin 15*a* to turn the pawl 16*a'* upwardly with respect to the lever 9*a*, so that in this way the end 17 of the pawl 16*a'* is moved out of the opening 18 of the lock member 19*a*. Once the end 17 of this pawl is out of opening 18 the spring 23 moves the movable lock member 19*a* to the left, as viewed in Figs. 1 and 3, to the starting position of this lock member. Thus, the spring 8 moves the movable pin portions 2 and 3 away from the stationary pin portions 2*a* and 3*a* to the open position shown in Figure 4. Upon release of lever 9*a*, the spring 27*a* urges the lever to its rest position in which it is located while the mechanism is open, as shown in Figure 3.

When the operator wishes to close the loose leaf binder mechanism, the lever 9*a* is again depressed. Thus, the lever 9*a* which is provided in its side walls 11 and 11*a* with cutouts similar to cutout 26 engages the pin 15*a* to move the latter downwardly so as to turn crank portion 7 in a clockwise direction, as viewed in Figure 4, against the action of spring 8 to move the movable pin portions 2 and 3 to their closed position, shown in Fig-2, where they, respectively, form closed loops with the stationary pin portions 2*a* and 3*a*. At the same time the carrier 13 is turned downwardly and the end 20 of lock member 19*a* engages the curved stationary lock member 22 so that the movable lock member 19*a* is moved to the right against the action of spring 23 until the carrier 13 reaches the position shown in Figure 1 where the spring 23 urges the end 20 of lock member 19*a* into opening 21 of the stationary lock member 22 so that the movable lock means is thus secured in its locked position shown in Figure 1. Then the operator releases the lever 9*a* which is returned to its rest position by the spring 27*a*, and the end 17 of pawl 16*a'* again becomes located in the opening 18 of movable lock member 19*a*, so that when

the lever 9*a* is again depressed the above operations will be repeated.

It is apparent from the above description that both the opening and the closing of the loose leaf binder mechanism of the invention takes place upon depression of lever 9*a*.

The embodiment of the invention which is shown in Figures 5 and 6 is structurally simpler than the embodiment shown in Figures 1 to 4. The movable plain shaped lock member 19*b* of Figures 5 and 6 is not guided in a carrier, as is the case with the embodiment of Figures 1 to 4, but instead has its opposite ends respectively extending through slot like openings of a stationary lock member 39 struck upwardly from the base plate 1*b* and a stationary guide member 40 also struck upwardly from the base plate 1*b*, this base plate having upwardly struck curved tongues 4*b* and 5*b* which guide the elongated member 6 for turning movement in the same way as with the embodiment of Figures 1 to 4. The movable and stationary pin portions as well as the leaf spring 8 and crank portion 7 of member 6 are identical with the structure of Figures 1 to 4. As is apparent from Figures 5 and 6, which respectively show the mechanism in its open and closed positions, the members 39 and 40 guide the lock member 19*b* for turning movement as well as for shifting movement to the right and left, as viewed in Figures 5 and 6. The stationary lock member 39 is provided with a transverse portion 41 which is parallel to base plate 1*b* and which defines part of the opening of member 39 through which lock member 19*b* extends, and the member 40 is also provided with a transverse portion 42 parallel to plate 1*b* and defines part of the opening of member 40 through which lock member 19*b* freely extends. The pin 15*b*, which corresponds to pin 15*a* of Figures 1 to 4, is fixed directly to lock member 19*b*. The pin 15*b* has preferably the form of a shoulder pin as the pin 15*c* shown in Fig. 9 and is fastened to lock member 19*b* in a similar manner as pin 15*c* is fastened to plates 63, 64. The pin 15*b* is located in the path through which the crank portion 7 turns. To decrease the friction between crank portion 7 and pin 15*b*, the latter turnably carries a roller 38*b* formed with an annular outer groove in which crank portion 7 is located and the roller 38*b* is formed and held on pin 15*b* in a similar manner as illustrated for roller 38*c* and pin 15*c* in Fig. 9. The member 40 is provided with a pair of eyes 43 which carry a pivot pin 44 on which the manually operable lever 9*b* is pivotally mounted, this lever 9*b* having a finger portion 10*b* which the operator engages to depress the lever 9*b*. The lock member 19*b* is provided with an inclined upper edge portion 19*b'* against which a roller 50, turnably carried by lever 9*b*, is adapted to press. Another edge portion of lock member 19*b* is formed with a cutout 53 into which the transverse portion 41 of member 39 extends for holding the lock means 19*b*, 15*b* in its locked position shown in Fig. 6. The lock member 19*b* is also provided with an extension 57 at its left end, as viewed in Figures 5 and 6.

The lever 9*b* has a U-shaped cross-section, as seen in Fig. 5*a*, so as to be provided with opposite side walls, and a pivot pin 16*b* is fixed to and extends between these side walls, this pivot pin 16*b* turnably carrying a pawl 16*b'* comprising a pair of opposite side wall portions located within the side walls of lever 9*b* and united by a cross wall portion extending between and substantially normal to the side wall portions. A wire spring 56 extends about the pivot pin 16*b*, has one end in engagement with lever 9*b*, and has an opposite end portion in engagement with the cross wall portion of pawl 16*b'* to urge the latter into engagement with the movable lock member 19*b*, the pawl 16*b'* extending into a cutout 58 formed in the movable lock member 19*b*. Thus, the single spring 56 serves to maintain the pawl 16*b'* in operative engagement with movable lock member 19*b* and to return the lever 9*b* to its rest position, shown in Figures 5 and 6, after depression of the lever 9*b*.

The structure of Figures 5 and 6 operates in the following manner:

If it is desired to move the loose leaf binder mechanism from the open position of Figure 5 to the closed position of Figure 6, then the operator engages the finger portion 10*b* of lever 9*b* to depress the latter. As is apparent from Figure 5, the roller 50 engages the edge portion 19*b'* of lock member 19*b*, so that the latter is turned downwardly, and because of the inclination of edge 19*b'*, the roller 50 urges the lock member 19*b* to the left, as viewed in Figure 5, simultaneously with downward movement of the movable lock member 19*b*. This lock member 19*b* will be moved downwardly and urged to the left until the transverse portion 41 of the stationary lock member 39 becomes located in the cutout 53 of lock member 19*b*, so that this lock member is secured in its locked position, and it will be noted that simultaneously with the downward movement of lock member 19*b* the pin 15*b* through roller 38*b* depresses crank portion 7 to move the movable pin portions 2 and 3 to their closed position. Thus, the stationary lock member 39 serves the same purpose as the stationary lock member 22 of Figures 1 to 4.

If it is desired to open the loose leaf binder mechanism, so that the parts thereof move from the position of Figure 6 to that of Figure 5, then the lever 9*b* is again depressed. It should be noted that after closing of the loose leaf binder mechanism, the spring 56 returns the lever 9*b* to the position shown in Figure 6 and locates the pawl 16*b'* in the position shown in Figure 6. Thus, with the parts in the position shown in Figure 6, the depression of lever 9*b* will cause pawl 16*b'* to move the movable lock member 19*b* to the right, as viewed in Figure 6, so that the cutout 53 moves away from the transverse portion 41 of member 39, and the movable pin portions 2 and 3 are thus released to the influence of leaf spring 8, which moves the mechanism to its open position, the crank portion 7 thus rising so as to raise the pin 15*b* and the movable lock member 19*b* to the position shown in Figure 5, until the extension 57 of lock member 19*b* engages the transverse portion 41 of the member 39, and in this position of the parts the edge portion 19*b'* of lock member 19*b* is again in engagement with roller 50.

The lever 9*b* is limited in its upward movement by engagement of a transverse lower edge portion 59 of lever 9*b* with the base plate 1*b*. The U-shaped cross-section of the lever 9*b* provides a covering for the pawl 16*b'*, and the spring 56 serves to return the lever 9*b* to its rest position so that it replaces the spring 27 of the embodiment of Figures 1 to 4.

As compared with the embodiment of Figures 1 to 4, the embodiment of Figures 5 and 6 has the advantage of greater simplicity and therefore less likelihood of faulty operation.

A further improvement of the structure of the invention in the same manner is illustrated in the embodiment of Figures 7 to 10. This embodiment of the invention is provided with a base plate 1*c* having the curved tongues 4*c* and 5*c* struck therefrom and turnably guiding the elongated member 6 which is identical with the elongated member 6 of the above described embodiment in that this elongated member 6 includes intermediate its ends a crank portion 7 which is in engagement with the leaf spring 8 and has connected to its ends the movable pin portions 2 and 3 which cooperate with the stationary pin portions 2*a* and 3*a*, respectively, in the manner illustrated in Figures 1 to 4.

The base plate 1*c* is provided with an upwardly struck ear 61 which carries a pivot pin 62 on which a pair of parallel plates 63 and 64 are turnably mounted, these plates respectively engaging opposite faces of ear 61, as is most clearly shown in Figure 10. In this embodiment

of the invention, the lever 9c, which is provided with the finger piece 10c, is in the form of a flat plate which extends between the plates 63 and 64 and which is pivotally connected thereto by pivot pin 65, as is most clearly shown in Figure 10. It will be noted from Figure 10 that the outer ends of pins 62 and 65 are upset to prevent movement of plates 63 and 64 away from each other. The pawl 16c is provided with a circular end portion 66 which is turnably located in a mating circular cutout formed in the lever 9c. The pawl 16c is also located between the side plates 63 and 64 and is in this way secured against falling from the mechanism.

Both of the side plates 63 and 64 are further fixed to the pin 15c which turnably carries an annularly grooved roller 38c in the same way as the pin 15b of Figures 5 and 6, this roller engaging crank portion 7, as is most clearly shown in Figure 9. A pivot pin 67 is fixed to and extends between the plates 63 and 64 and pivotally carries a movable lock member 68 which is hook-shaped, as shown in Figures 7 and 8, the hook member 68 being provided with the hook-like projection 69 and with a pair of additional projections 70 and 71. The projection 70 cooperates with the pawl 16c. A stationary lock member 72 is fixed to the base plate 1c and is provided with a projection 73 which cooperates with the hook end 69 of lock member 68. A wire spring 74 is fixed intermediate its ends to a pin 74' which is fixed to the side plates 63 and 64, and this substantially U-shaped spring 74 presses on the one hand against the lever 9c and on the other hand against the movable lock member 68 and serves simultaneously as a return spring for the lever 9c and as a spring for urging the movable lock member 68 into locking engagement with the stationary lock member 72.

In order to limit upward turning movement of side plates 63 and 64, at least one of these side plates is provided with a projection which engages a stop 80 formed on the ear 61. The lever 9c is formed with a slot 75 into which a tongue 76 struck from side plate 63 extends to limit turning of lever 9c with respect to the side plates 63 and 64.

The above structure operates in the following manner:

When the movable pin portions 2 and 3 are in their closed position, as shown in Figure 7, then the left elongated free portion of lever 9c is substantially parallel to the base plate 1c. The spring 74 urges the lever 9c upwardly until the lower end of slot 75 engages the tongue 76. With the parts in the position shown in Figure 7, depression of lever 9c moves the turning axis of the pawl 16c so that the latter presses on projection 70 of the movable lock member 68 to turn the latter in a counterclockwise direction, as viewed in Figure 7, against the action of spring 74 out of engagement with projection 73 of the stationary lock member 72, so that in this way the spring 8 is free to move the crank portion 7 upwardly which, in turn, moves the pin 15c upwardly to turn the side plates 63 and 64 upwardly to the position of Figure 8 where the loose leaf binder mechanism is in its open position. As the pin portions 2 and 3 move away from the stationary pin portions 2a and 3a, respectively, the pawl 16c slides along the projection 70 of the movable lock member 68 and becomes located in the cutout 77 formed in lever 9c. Also the spring 74 returns the lever 9c to its rest position where the lower right end 78 of lever 9c, as viewed in Figures 7 and 8, engages a stop portion 79 of the ear 61. In order to limit the extent to which the mechanism is opened, the plate 64 turns until it engages stop 80. It will be noted that the tongue 76 is now located at the top end of slot 75.

In order to close the loose leaf binder mechanism, the lever 9c is again depressed so that the lever 9c turns the side plates 63 and 64 downwardly about the pivot pin 62 through engagement of lever 9c with the tongue 76. The movable lock member 68 slides along the projection 73 of the stationary lock member 72 and, when the mechanism is in its closed position, the hook end 69 of movable lock member 68 moves under the influence of spring 74 into locking engagement with the stationary lock member 72 so that the side plates 63 and 64 are secured in their lower position. During this downward movement of the side plates 63 and 64 the pin 15c, through the roller 38c, of course turns the movable pin portions 2 and 3 to their closed position. Upon release of the lever 9c, the latter is returned to its upper rest position by the spring 74, this movement being limited by engagement of tongue 76 with the lower end of slot 75. At this time, the pawl 16c falls into the position shown in Figure 7 whereupon the next depression of lever 9c the movable lock member 68 will be turned out of locking engagement with the stationary lock member 72. Thus, with this embodiment of the invention the plates 63 and 64 together with the pin 15c and movable lock member 68 form a movable lock means performing the same results as the movable lock means of Figures 1 to 4 and Figures 5 and 6.

The embodiment of Figures 7 to 10 provides the advantage of locating the pawl 16c, the movable lock member 68, and the spring 74 between the side plates 63 and 64 so that these elements are safely hidden and guided to prevent faulty operation of the mechanism during opening and closing thereof.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of loose leaf binder mechanisms differing from the types described above.

While I have illustrated and described the invention as embodied in loose leaf binder mechanisms an operating member of which is movable in one direction of closing and opening the mechanism, I do not intend to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of my invention.

Without further analysis, the foregoing will so fully reveal the gist of my invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a loose leaf binder a mechanism for moving an elongated member formed with a crank portion between a first and a second position and for releasing the member from the second position thereof comprising, in combination, base plate means; a first spring adapted to engage the crank portion of said elongated member for urging the same to the first position thereof; a stationary lock member fixed to said base plate means; movable lock means for holding the elongated member in the second position thereof when said movable lock means is in a locked position, said movable lock means engaging said crank portion to move the same and to be moved thereby and having a locking portion engaging said stationary lock member when said movable lock means is in said locked position thereof; a manually operable lever turnably carried by one of said means for turning movement from a rest position together with said movable lock means for moving the latter to said locked position thereof to simultaneously move said crank portion through said movable lock means against the action of said first spring during movement of the elongated member to the second position thereof; a second spring engaging said lever for urging the latter to said rest position thereof; and pawl means turnably carried by said lever and engaging said movable lock means for moving said locking portion thereof out of engagement with said stationary lock member to release said movable lock means and said elongated member to the influence of said first spring to move the elongated member from the

second to the first position thereof, so that said lever is moved in only one direction during movement of the elongated member between the two positions thereof.

2. In a loose leaf binder a mechanism for moving an elongated member formed with a crank portion between a first and a second position and for releasing the member from the second position thereof comprising, in combination, base plate means; a first spring adapted to engage the crank portion of said elongated member for urging the same to the first position thereof; a stationary lock member fixed to said base plate means; movable lock means for holding the elongated member in the second position thereof when said movable lock means is in a locked position, said movable lock means being movably carried by said base plate means and engaging said crank portion to move the same and to be moved thereby, and said movable lock means having a movable lock member slidably carried by the remainder of said movable lock means for movement into engagement with said stationary lock member when said movable lock means is in said locked position thereof, said movable lock member being formed with an opening passing therethrough; a manually operable lever turnably carried by one of said means for turning movement from a rest position together with said movable lock means for moving the latter to said locked position thereof to simultaneously move said crank portion through said movable lock means against the action of said first spring during movement of the elongated member to the second position thereof; a second spring engaging said lever for urging the latter to said rest position thereof; and pawl means turnably carried by said lever and extending into said opening of said movable lock member for engaging and moving the latter out of engagement with said stationary lock member to release said movable lock means and said elongated member to the influence of said first spring to move the elongated member from the second to the first position thereof, so that said lever is moved in only one direction during movement of the elongated member between the two positions thereof.

3. A mechanism as defined in claim 2 and wherein said movable lock means comprises an elongated carrier which slidably carries said movable lock member and which is pivotally carried by said base plate means, and a pin fixed to said carrier and engaging said crank portion of said elongated member, said lever being turnably carried by said carrier.

4. A mechanism as defined in claim 3 and wherein said stationary lock member is formed with an opening and wherein a third spring engages said movable lock member to urge an end thereof into said opening of said stationary lock member.

5. A mechanism as defined in claim 1 and wherein a third spring engages said pawl means to maintain the latter in engagement with said locking portion of said movable lock means.

6. A mechanism as defined in claim 2 and wherein said movable lock means comprises an elongated carrier of U-shaped cross section which slidably carries said movable lock member between opposite side walls of said carrier and which is pivotally carried by said base plate means, and a pin fixed to said carrier and engaging said crank portion of said elongated member, said lever being turnably carried by said carrier.

7. A mechanism as defined in claim 2 and wherein said movable lock means comprises an elongated carrier of U-shaped cross section which slidably carries said movable lock member between opposite side walls of said carrier and which is pivotally carried by said base plate means, and a pin fixed to said carrier and engaging said crank portion of said elongated member, said lever being turnably carried by said carrier, said lever including a bifurcated end portion pivotally connected to said side walls of said carrier and in which said pawl means is located.

8. A mechanism as defined in claim 1, said lever having an elongated free end portion which is substantially parallel to said base plate means when said lever is in said rest position thereof, and limiting means engaging said lever to prevent movement thereof beyond said rest position under the influence of said second spring.

9. A mechanism as defined in claim 8, said free end portion of said lever being formed with an opening and said limiting means including an elongated pin extending through said opening and having a head end engaging said lever.

10. A mechanism as defined in claim 9, wherein said second spring is in the form of a coil spring located about said elongated pin and engaging said lever to urge the same toward said head end of said elongated pin.

11. In a loose leaf binder a mechanism for moving an elongated member formed with a crank portion between a first and a second position and for releasing the member from the second position thereof comprising, in combination, base plate means; a first spring adapted to engage the crank portion of said elongated member for urging the same to the first position thereof; a stationary lock member fixed to said base plate means and being formed with an opening; a stationary guide member also formed with an opening, being fixed to and forming part of said base plate means and being spaced from and located opposite said stationary lock member; movable lock means extending freely through said openings of said stationary lock member and said guide member to be guided in its movement by said stationary lock member and guide member for holding the elongated member in the second position thereof when said movable lock means is in a locked position, said movable lock means engaging said crank portion to move the same and to be moved thereby and having a locking portion engaging said stationary lock member when said movable lock means is in said locked position thereof; a manually operable lever turnably carried by one of said stationary members for turning movement from a rest position together with said movable lock means for moving the latter to said locked position thereof to simultaneously move said crank portion through said movable lock means against the action of said first spring during movement of the elongated member to the second position thereof; a second spring engaging said lever for urging the latter to said rest position thereof; and pawl means turnably carried by said lever and engaging said movable lock means for moving said locking portion thereof out of engagement with said stationary lock member to release said movable lock means and said elongated member to the influence of said first spring to move the elongated member from the second to the first position thereof, so that said lever is moved in only one direction during movement of the elongated member between the two positions thereof.

12. A mechanism as defined in claim 11 and wherein said stationary lock member includes a transverse portion substantially parallel to said base plate means and defining part of said opening in said stationary lock member and said locking portion of said movable lock means being integral with the latter and formed with a cutout in which said transverse portion of said stationary lock member is located when said movable lock means is in said locked position thereof.

13. A mechanism as defined in claim 1 and wherein said movable lock means is in the form of a plate having a pin fixed thereto and located in the path of movement of said crank portion of said elongated member, said plate being formed in an edge portion thereof with a cutout in which said pawl means extends to engage said plate for moving the latter from said locked position thereof.

14. A mechanism as defined in claim 1 and wherein said manually operable lever has a U-shaped cross section and is provided with opposite side walls between which said pawl means is located.

15. A mechanism as defined in claim 1 and wherein

said movable lock means is in the form of a pair of plates turnably carried by said base plate means and engaged by said manually operable lever for movement into said locked position of said movable lock means, said locking portion of said movable lock means being in the form of a hook member pivotally carried by at least one of said plates, and said movable lock means also including a pin fixed to at least one of said plates and located in the path of movement of said crank portion of said elongated member.

16. A mechanism as defined in claim 15 and wherein said second spring engages said hook member to urge the same into locking engagement with said stationary lock member, said hook member having an edge portion engaged by said pawl means when said movable lock means is in said locked position thereof so that upon movement of said lever against the action of said second spring said pawl means moves said hook member out of engagement with said stationary lock member.

17. A mechanism as defined in claim 1 and wherein said movable lock means is in the form of a pair of plates turnably carried by said base plate means and engaged by said manually operable lever for movement into said locked position of said movable lock means, said locking portion of said movable lock means being in the form of a hook member pivotally carried by and located between said plates, and said movable lock means also including a pin fixed to at least one of said plates and located in the path of movement of said crank portion of said elongated member, said lever extending between and being pivotally connected to said plates.

18. A mechanism as defined in claim 1, said base plate means including an ear integral therewith and said movable lock means being in the form of a pair of plates turnably carried by said ear and engaged by said manually of said movable lock means, said locking portion of said movable lock means being in the form of a hook member pivotally carried by at least one of said plates, and said movable lock means also including a pin fixed to at least one of said plates and located in the path of movement of said crank portion of said elongated member, at least one of said plates having a stop portion engaging said ear to limit the extent of movement of said movable pin portions from said stationary pin portions.

19. A mechanism as defined in claim 1 and wherein said movable lock means is in the form of a pair of plates turnably carried by said base plate means and engaged by said manually operable level for movement into said locked position of said movable lock means, said locking portion of said movable lock means being in the form of a hook member pivotally carried by and located between said plates, and said movable lock means also including a pin fixed to at least one of said plates and located in the path of movement of said crank portion of said elongated member, said lever extending between and being pivotally connected to said plates, and said lever being formed with an opening, one of said plates having a tongue extending into said opening of said lever to limit movement of the latter with respect to said plates.

20. A mechanism as defined in claim 1 and wherein said movable lock means is in the form of a pair of plates turnably carried by said base plate means and engaged by said manually operable level for movement into said locked position of said movable lock means, said locking portion of said movable lock means being in the form of a hook member pivotally carried by at least one of said plates, and said movable lock means also including a pin fixed to at least one of said plates and located in the path of movement of said crank portion of said alongated member, said second spring being substantially U-shaped and having a pair of legs one of which engages said lever to urge the latter to said rest position thereof and the other of which engages said hook member to urge the latter into locking engagement with said stationary lock member.

References Cited in the file of this patent

UNITED STATES PATENTS

394,249	Clifford	Dec. 11, 1888
778,910	Sonnecken	Jan. 3, 1905
1,618,963	Knaak	Feb. 22, 1927
2,494,898	Rea	Jan. 17, 1950
2,519,932	Rostoker	Aug. 22, 1950
2,789,561	Bonn	Apr. 23, 1957

FOREIGN PATENTS

981,365	France	Jan. 10, 1951