

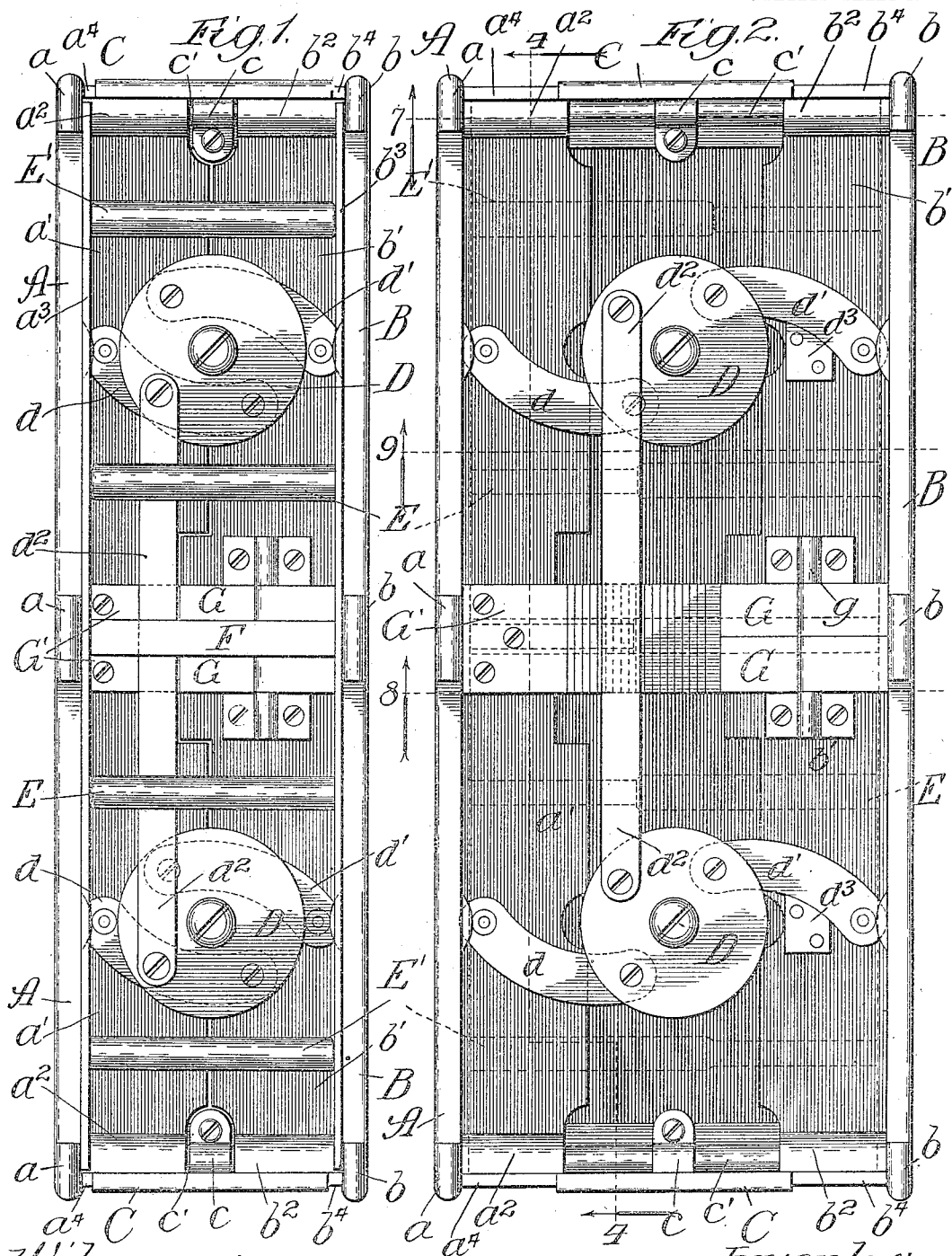
E. C. HOLLAND.
BINDER AND LEAVES.

APPLICATION FILED MAY 31, 1905.

949,959.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.



Witnesses:
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Chas. H. Buell

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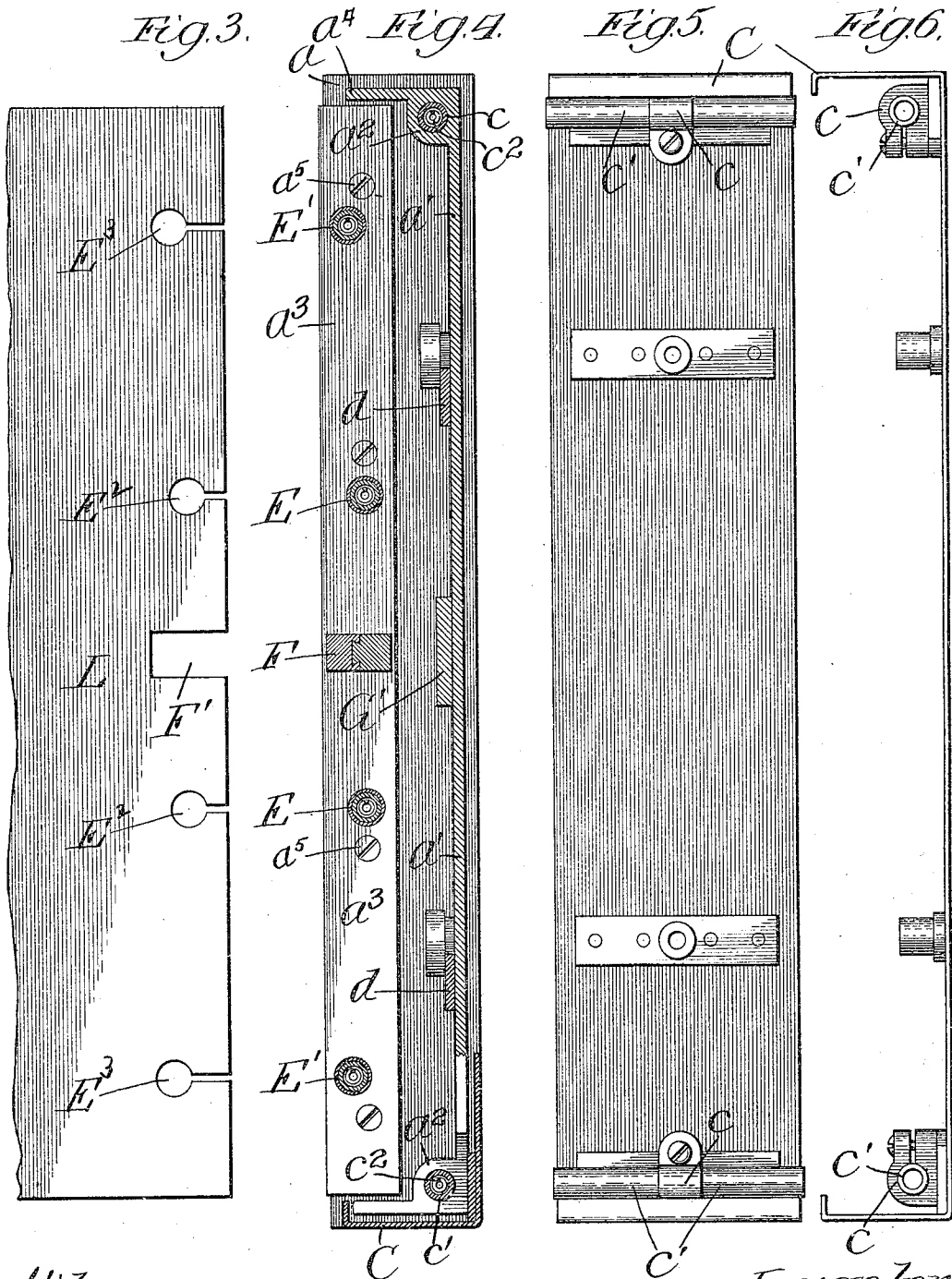
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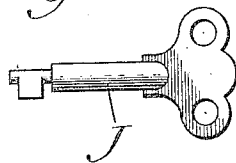
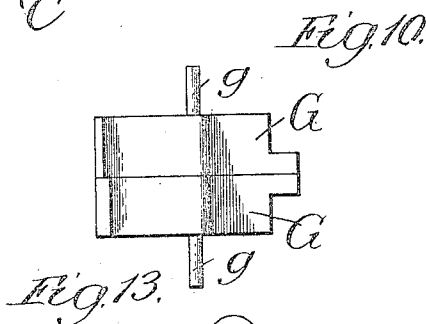
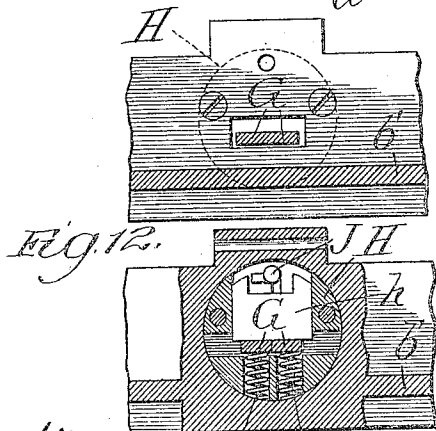
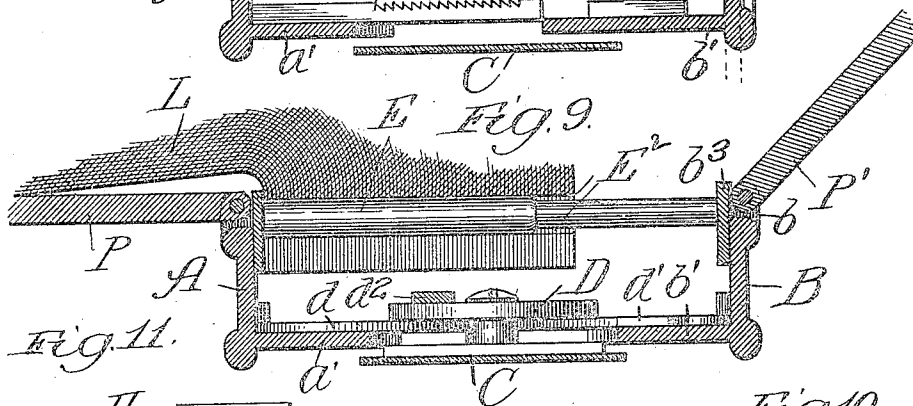
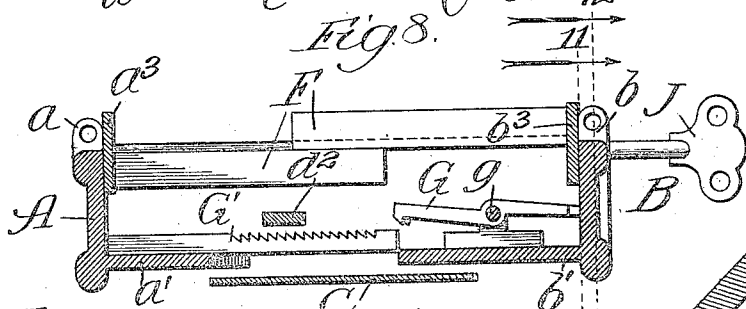
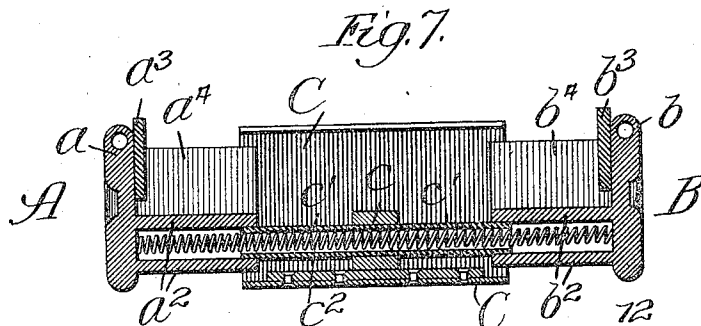
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949,959.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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BINDER AND LEAVES.

949,959.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed May 31, 1905. Serial No. 263,013.

To all whom it may concern:

Be it known that I, ELIAS C. HOLLAND, of the city of Benton Harbor, county of Berrien, and State of Michigan, have invented certain new and useful Improvements in Binders and Leaves; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings.

My invention relates to that class of binders and leaves in which all the binding parts are included between two clamping bars, and the leaves may be inserted and withdrawn without removing either of the covers, and resides in the various novel devices and combinations of the same herein illustrated and described, together with their mechanical equivalents, and which are pointed out with more particularity in the claims appended hereto.

In the drawings Figure 1 represents a front elevation of my binder, with the leaves removed, in a locked or closed position. Fig. 2 represents a front elevation of the same in an open or expanded position. Fig. 3 is a detail of one of my leaves, showing the peculiar perforation for binding. Fig. 4 is a sectional view taken through the line 4—4 of Fig. 2. Fig. 5 is a detail of the middle back of my binder and Fig. 6 is a plan view of Fig. 5. Figs. 7, 8 and 9 are sectional views of my binder taken respectively through the lines 7—7, 8—8 and 9—9 of Fig. 2. Fig. 10 is a detail of the pawls of my binder lock. Figs. 11, 12 and 13, are details of my locking mechanism.

More particularly described, A and B represent the binding members of my binder and consists of *a* and *b* the binding bars, *a'* and *b'* the back flanges of the same, *a⁴* and *b⁴* the end flanges of the same and *a²* and *b²*, tubular sockets secured to the bars *a* and *b* at their juncture with the back flanges *a'* and *b'* and the end flanges *a⁴* and *b⁴*, and secured oppositely to each other. These parts *a*, *a'* and *a²* and *b*, *b'* and *b²* of each binding member A. and B, are preferably made of one casting or if of more than one piece are secured rigidly together. The covers P and P' are hinged respectively to the members A and B.

C represents the middle back of my binder and consists of a strip of rigid material lying back of and parallel with the said binding members A and B, and overlap-

ping the flanges *a'* and *b'*. In the process of opening and closing or expanding and contracting the parts of my binder the members A and B, are designed to move from and toward each other, thereby alternately increasing and diminishing the distance between the flanges *a'* and *b'*. Inasmuch as the flanges *a'* and *b'* together with the back C are intended to cover and protect the back ends of the leaves, the back C must be so constructed that when the flanges *a'* and *b'* are drawn apart in the expansion of the device, the back C will at all times cover the space between the said flanges, thereby effectually protecting the back end of the leaves. I provide, therefore, means whereby the back C is held at all times in the same relative position to the members A and B. This means I describe as follows:—A series of disks or pitman cranks D D, I secure pivotally to the inner face of the back C. To these disks or pitman cranks D, D, I secure pivotally one end of the pitmen *d d*, the other end of which are secured by like pivotal engagement to the inner face of the flange *a'*. Opposed to the pitmen *d d*, I also secure pivotally to the cranks D, D, one end of the pitmen *d' d'*, and the other end of them also pivotally to the inner face of the flange *b'*. In the expansion and contraction of the binder, see Figs. 1 and 2 of the drawing, the flanges *a'* and *b'* move toward and from each other and, carrying with them the pitmen *d* and *d'*, the cranks D D are caused to rotate. The pitmen *d* and *d'* operating in exact relation with each other, the pivotal connections of the cranks D D with the back C are held in a fixed position thereby retaining the back C in its middle position as designed.

As it is desirable to insure the members A and B in operation to move toward and from each other uniformly throughout their length, I provide means for effecting this end: The cranks D D and their accompanying pitmen *d* and *d'* forming respectively connections between the flanges *a'* and *b'* at different points, I secure the cranks D D together by the connecting rod *d²*, pivotally connected at its ends to the cranks D D respectively. This connecting rod *d²* insures exact relation in the rotation of the cranks D D and through them maintains the same relation between the binding members A and

B. To prevent the rotation of the cranks D D and the consequent separation of the members A and B farther than is desirable, I provide stops in the form of blocks d^3 d^3 secured to one of the flanges a' or b' and against which the pitmen d or d' strike in the expanding operation.

I provide spring posts in my device as follows: To the inner face of the back C and opposite the sockets a^2 b^2 of the members A and B, I secure clamps c c . Within the clamps c c I secure tubes c' c' engaging at their opposite ends the sockets a^2 a^2 and b^2 b^2 respectively. These tubes c' c' are of such size and length that in the operation of the binder they will telescope into the said sockets a^2 b^2 and at no point in the expansion of the binder will they disengage from said sockets. Within the said tubes c' c' and the engaging sockets a^2 a^2 and b^2 b^2 , I place expansion springs c^2 c^2 which force the members A and B apart when released from a locked position.

The construction of the binding posts in my device is inconsequential so far as it relates to the style and shape of them. Any desirable shape and any desirable style of extensible post may be used. I prefer, however, to use the telescoping posts E, E, E', E'. These posts may be secured to the respective binding bars a , b , or preferably to the metal strips a^3 and b^3 , which are removably attached to the inner face of said bars a and b by means of screws a^5 a^5 . Screws a^5 are shown at Fig. 4. Like screws b^5 , not shown, attach the metal strip b^3 to the bar b . The relation of the said metal strips to the said bars is shown at Figs. 7, 8, and 9. I have conceived the idea of placing these binding posts E E E' E' in different positions relative to the side edges of the metal plates a^3 and b^3 for the following reasons:—

1st. A great difficulty experienced in the matter of binders of this class is in attempting to secure sufficient strength without making the device too heavy to handle. By placing the binding posts in the different positions which I have just mentioned, I divide the strain upon the binder over a larger area than were the posts attached in a line. When the binder is filled with leaves fitting closely to the posts, the posts are held rigid against lateral tension, and being disposed over a larger area of the binder front and back, add material strength to the device in resisting the strain caused by the violent opening of the binder book.

2nd. Leaves punched to fit upon binder posts, will, after having been used for some time, wear at the openings and when the binder is expanded and the leaves are being moved back and forth along the posts, they are inclined to shift from side to side, and the binder being again closed, the leaves are apt to be out of alinement and not easily fin-

gered. By placing the posts at different positions in relation to the side edges of the metal strips a^3 and b^3 , as mentioned, part of the posts project farther forward from the binder than the others. Therefore, in punching the leaves to fit upon the posts, it is necessary to locate the apertures at different distances from the binding edge of the leaf. By this construction I afford bearings upon the leaf punched sufficiently far from its edge to gain the best support of the body of the paper and at the same time have sufficient number of perforations near the edge of this sheet to enable one to easily insert and remove the same from the binder, the sheets being slit from the perforations to the edge to enable the sheets to be placed around the posts without passing them over the end thereof.

I prefer to place my posts in series, each series being located at a different distance from the front edge of the binder, and each series having two or more posts, the purpose of this being that when the leaves are transferred into another binder having only two posts any one of the series may be used to engage the leaves which correspond with the gage of the other binder.

If the posts E, E' are determined to be insufficient to properly maintain the alinement of the leaves, there may be added the post F which is rectangular in cross section, and presents a greater binding area to the leaves than do the posts E, E'. This post F, I would secure to the bars a and b or the strips a^3 and b^3 as are the posts E, E'. This post F may be constructed to any suitable extensible style. I prefer to construct it of two pieces of solid material having lateral sliding engagement with each other, effected by means of a loose dovetail connection as shown in Fig. 4. The use of this post F has also the effect to secure a higher degree of rigidity and strength to the binder.

My leaves L L are especially adapted to engage the posts E E' of my binder. They are perforated E^2 E^2 E^3 E^3 as shown at Fig. 3. Part of said perforations E^2 E^2 are placed nearer to the back edge of the leaf L than the others E^3 E^3 and correspond in number and position with the posts E and E' respectively. The leaf L is slit opposite the perforations E^2 E^3 in order to allow the removal of the leaves from the binding without lifting them off the ends of the posts E E'. In case it is found desirable to use the post F an additional perforation or a slot F' in the leaves will have to be provided to receive said post F.

My locking mechanism is described as follows:—To the inner face of the flange a' I fix a pin g . Upon this pin through suitable apertures I swing a series of pawls, G G. These pawls G G are designed to engage with a pawl rack G' oppositely at-

tached to the flange b' . The pawls G G are as to their point of contact with the rack G' of unequal length or staggered. The purpose of this construction is to increase the number of locking positions of the binder and the effect is that only a part of the whole number of pawls engage the rack G at the same time. The number of these staggered pawls may be increased or decreased and the width of the rack G' , be varied as may seem desirable, or expedient.

The pawls G G are of such length as to project through a suitable aperture in the bar a . Upon said bar a I place an escutcheon H , and within it a sliding block h engaging the projecting ends of the pawls G G . Within said escutcheon and opposite to said sliding block h I provide in suitable recesses expansion springs h' h' which engage the said projecting ends of the pawls G G , and hold them normally in engagement with the rack G' . I provide a key J which is inserted through a suitable key hole in the escutcheon plate and engages the said block h to drive it against the pawls G G and disengage them from the rack G' .

What I claim as my invention is,

1. In a binder, the combination of expansible binding members and a lock therefor with an expansible post frame removably attached to the said binding members and lock.

2. In a binder the combination with binding members of a plurality of series of extensible posts, each of said series adapted to pass through a series of apertures in a sheet of paper located at a different distance from the edge of said sheet of paper than a similar aperture or apertures engaging the other series of said binding posts.

3. In a binder the combination with binding members of a plurality of series of extensible posts, said series being adapted respectively to pass through apertures in a sheet of paper located at different distances from the edge of said sheet of paper.

4. In a binder the combination with binding members and a plurality of series of extensible posts, of a plurality of sheets of paper, each sheet being provided with two or more series of apertures located respectively at different distances from the edge of said sheet, and having engagement respectively with the said series of extensible posts.

5. In a binder the combination with flanged binding members, a binder back, extensible posts and removable leaves, of a spring post consisting of a tube attached to said binder back and extending at right angles toward

said flanged binding members, and an expansion spring passing through said tube and being seated at its ends respectively against the said binding members.

6. In a binder the combination with flanged binding members, a binder back, extensible posts and removable leaves of a spring post consisting of opposing sockets fixed to said flanged binding members, a tube fixed to said binder back and telescoping into said sockets and an expansion spring seated within said sockets and passing through said tube, substantially as described.

7. In a binder the combination with binding members, spring posts, binding posts and removable leaves, of a lock consisting of a rack attached to one of said binding members, a plurality of pawls rotatably attached to a shaft fixed to said other binding member, and having staggered engagement with said rack, whereby only a part of said pawls engage said rack at any one time, and means of actuating said pawls, consisting of a sliding block engaged with one of said binding members and opposed to the said pawls, to be driven by means of a key against said pawls and disengage them from said rack, and springs adapted to force said pawls into engagement with said rack, when said sliding block is released.

8. In a binder the combination with binding members and a lock consisting of a rack attached to one of said members, and a plurality of pawls attached to said other member and having staggered engagement with said rack, and means for actuating said pawls, of a plurality of series of extensible posts removably attached to said binding members and adapted to engage leaves perforated at different distances from the edge thereof, and leaves provided with series of perforations at different distances from the edge thereof, and corresponding in number, size and position to said multiple of series of extensible posts.

9. In a binder, the combination with binding members of a plurality of series of binding posts, of a plurality of sheets of paper, each sheet being provided with two or more apertures slitted and located at different distances from one edge of the said sheet, and adapted to engage said binding posts.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ELIAS C. HOLLAND.

Witnesses:

LOWELL H. RICE,
GEORGE A. SHOEMAKER.