

K. W. HANKE.
 MEANS FOR BINDING BOOKS.
 APPLICATION FILED MAR. 31, 1913.

1,105,196.

Patented July 28, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

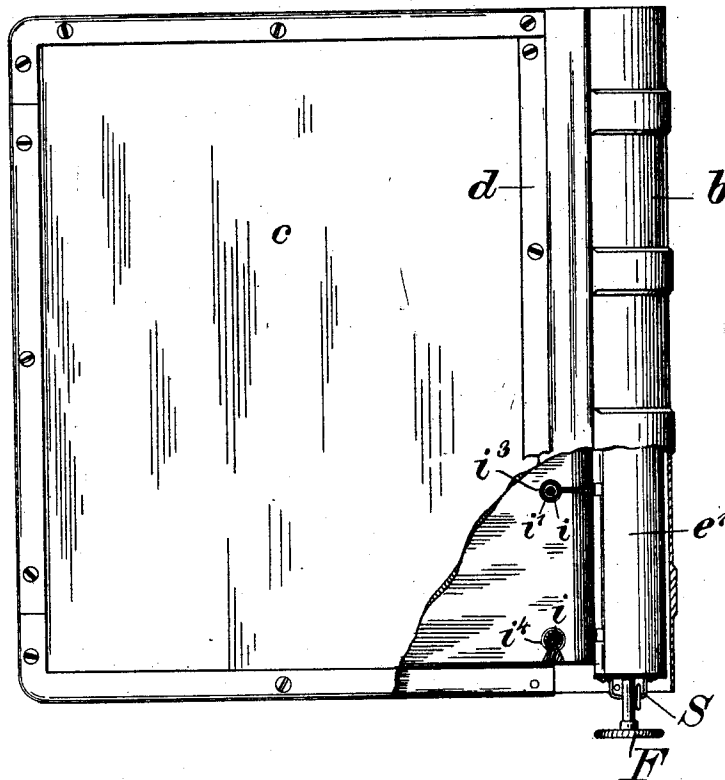


Fig. 4.

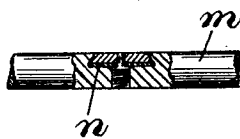
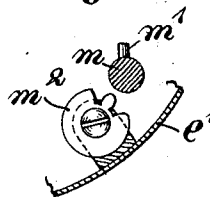


Fig. 5.



Witnesses:

Paul Jacoby
Wm. Zimmerman

Inventor:

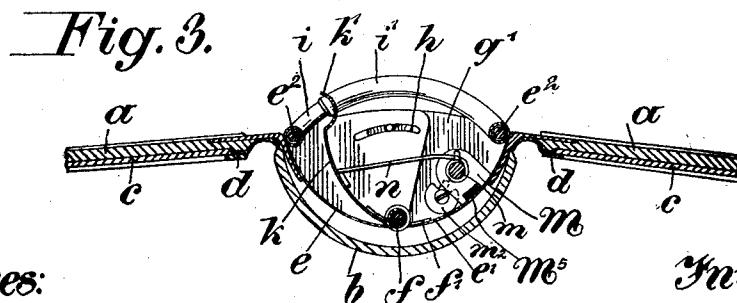
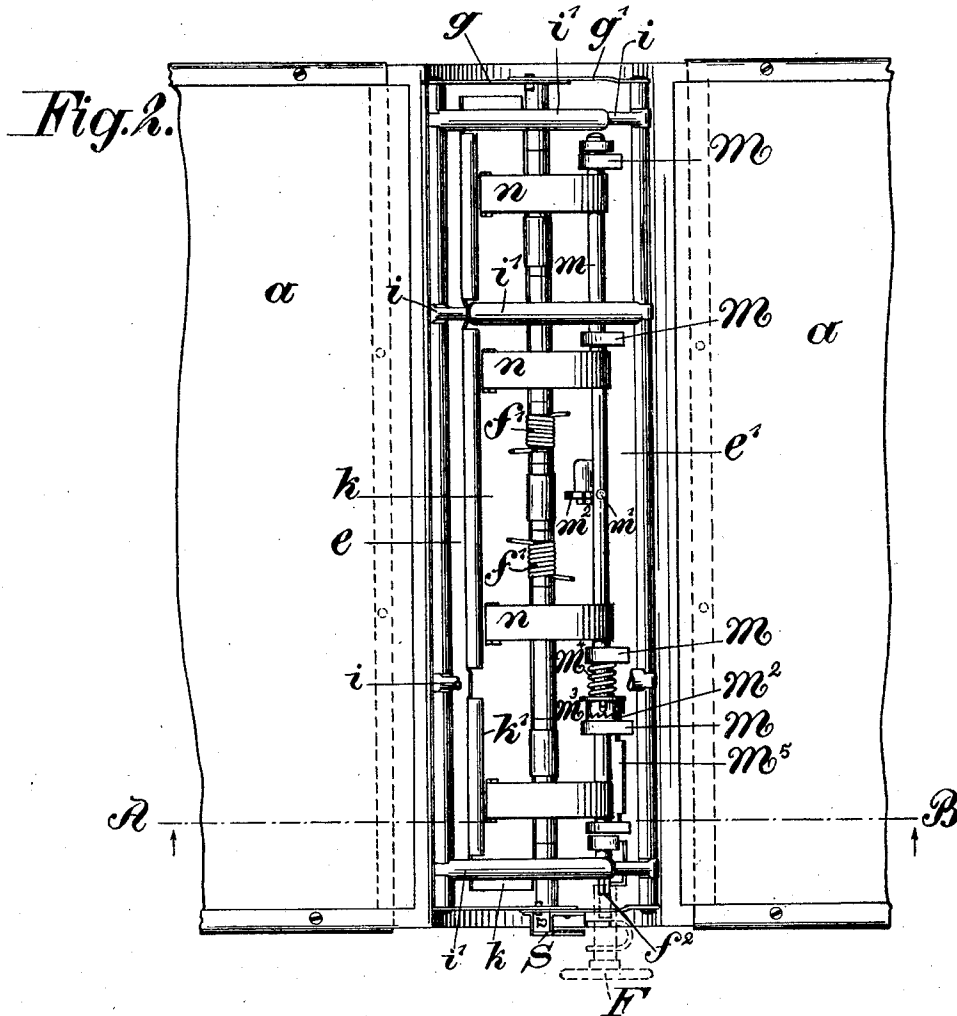
Karl Wilhelm Hanke

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2 SHEETS—SHEET 2.



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Wm. J. Zimmerman

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UNITED STATES PATENT OFFICE.

KARL WILHELM HANKE, OF BERLIN, GERMANY.

MEANS FOR BINDING BOOKS.

1,105,196.

Specification of Letters Patent.

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Application filed March 31, 1913. Serial No. 757,918.

To all whom it may concern:

Be it known that I, KARL WILHELM HANKE, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented certain new and useful Improvements in Means for Binding Books, of which the following is a specification.

My invention relates to improved means for binding books, and more particularly to means of that class, by which the leaves of the book are bound in a manner to be singly removed or exchanged, said means consisting, broadly, of tubular pins traversing the leaves from one side and corresponding pins engaging said hollow pins from the opposite side. Means of such kind for removably or exchangeably binding leaves or sheets into a book, are well known; the improvements of my invention are particularly adapted to hold the leaves or sheets firmly clasped against each other through the medium of a cheek arranged to turn on a shaft within the back of the book, said cheek being controlled by the pressure of a spring or springs and means being provided to temporarily counteract the pressure of said spring or springs.

To make my invention perfectly understood, I have illustrated the same in the accompanying drawings, in which:

Figure 1 is a plan of a closed book containing the binding means according to this invention; the cover of the book being partly broken away. Fig. 2 is a plan view of an open book provided with the improved mechanism of my invention; the covers of the book being partly broken away. Fig. 3 is a cross-section drawn on line A—B of Fig. 2. Figs. 4 and 5 serve to explain details of construction, drawn to a larger scale.

The two covers *a* of the book are flexibly connected to the outer back *b* of the book and preferably provided with a suitable lining *c* of linoleum or similar material, secured by a frame of ledges *d* or the like.

Within the outer back *b* of the book an inner back of metal is provided, said inner back being composed of two curved metal sheets *e*, and *e*¹, so combined to form with each other a semi-circular trough. The said curved sheets *e*, and *e*¹, are hinged to a shaft *f* centrally lodged within the back of the book in its longitudinal direction. The top and bottom of said semi-circular trough are formed by sheet metal sides *g* and *g*¹, integral with or secured to the curved sheets *e*

and *e*¹, and connected to each other by a slot *h*, and pin engaging said slot. By this means the said curved sheets *e*, and *e*¹, are adapted to move against each other, but limited in their path toward and from each other. The free edges of the two curved sheets *e* and *e*¹, are rolled up to form tubular bearings for receiving, each, a longitudinal rod *e*², one of which two rods carrying the solid pins *i*, and the other rod the hollow pins *i*¹ to be engaged by the said solid pins, as shown in Figs. 2 and 3.

The several leaves or sheets to be bound into the book are provided, each, with a number of holes *i*³, corresponding to the pins *i*, and *i*¹, to be traversed through said holes, and from said holes *i*³, slots extend to the edge of the sheets, as fully shown in Fig. 1. The slot extending from the uppermost and from the lowermost hole *i*⁴ of each sheet increases in width from the said hole to the edge of the sheet, as fully shown in Fig. 1. This facilitates the introduction of the pins into the sheets. The said central rod *f* extending through the length of the back of the book and to which the two curved sheets *e*, and *e*¹, are hinged, also carries a cheek *k*, capable of turning on said rod *f*. Raised on the inside surface of the curved metal sheet *e*¹ are a number of bearings *M*, serving to receive a longitudinal shaft *m*, to which a number of traction members such as steel blades *n*, are secured. The mode of securing said blades *n*, to the shaft *m*, may preferably be accomplished as shown in Fig. 4. The shaft is provided with dovetail slots in the cross direction each adapted for the reception of a corresponding trapezoidal plate and the end of a blade inserted between said shaft and blade and clamped thereto by means of a suitable set screw traversing the shaft. Spiral springs *f*¹, *f*¹, are wound up to the central rod *f*, each of said springs having one of its free projecting ends bearing against the inside surface of the curved metal sheet *e*¹, and its other free projecting end against the said cheek *k*, as fully shown in Figs. 2 and 3. Owing to said springs *f*¹ the said cheek *k* will permanently be pressed to the left as much as possible so as to allow leaves to be fully exchanged.

A square portion *f*² is formed to one end of the shaft *m*, and said square portion is adapted to receive a key *F*, for turning said shaft *m*. It will be readily seen that by turning said key to the right of Fig. 3, the

blades n will be wound up to the shaft m , and that, thereby, the cheek k will be drawn to the right, against the tension of the springs f^1 . The upper, free longitudinal edge of said cheek k has a slight curve k^1 toward the inside, and as said cheek is being turned or drawn to the right of Fig. 3, the said edge k^1 will forcibly, but resiliently be made to bear against the leaves or sheets of paper filed up to the pins i, i^1 . The utmost throw of the edge k^1 of cheek k to the right will be that, in which it would bear against the right-hand rod e^2 at the base point of the curved metal sheet e^1 , and thus it will be easily understood, that, even if but a very few leaves or sheets of paper are put on file on the pins i, i^1 , they will be firmly held and securely engaged by the pressure of said cheek k . To prevent the said cheek k from returning to the left under the pressure of the springs f^1 , one of the bearings M carries formed or secured to it a coupling member M^2 , into which engages a corresponding coupling member M^3 adapted to slide upon the shaft m , but prevented from turning on said shaft. A coiled spring M^4 on said shaft m permanently tends to keep the said coupling piece M^3 engaged into the fixed coupling member M^2 . Secured to the said sliding member M^3 is a rod or bar M^5 extending along the shaft m up to the square portion f^2 of said shaft. On forcing the key F to the inside, its forward end will act against said bar M^5 and drive the member M^3 out of engagement with the member M^2 , the spring M^4 being compressed by the inward pressure of the key F . On releasing the said coupling members M^2 and M^3 the springs f^1 will be able to return the cheek k to the left and the pins may be opened for removing or exchanging any single sheet or sheets filed on to the pins i, i^1 .

It will be readily understood, that, for clamping the leaves or sheets of the book against each other and for holding the same tightly clamped, the key F need only be put to the square portion f^2 of shaft m and turned to the right, while, for releasing the clamped state, the said key is equally shifted onto the said square f^2 and pressed inward.

To prevent the curved metal sheet e from being excessively turned to the left by the springs f^1 , the shaft m may be provided with a projecting pin m^1 , as shown in Fig. 5. Juxtaposed to said pin is a small wheel m^2 carried by a stud in a post or bracket of the curved metal sheet e^1 , as fully shown in Figs. 3 and 5. The said wheel m^2 has but a few indentations to be engaged by the said pin m^1 , and it will be seen, that, when the said pin m^1 , has passed over the said

indentations of the wheel m^2 , it will bear against the full circumferential portion of said wheel and stop any further rotatory motion of shaft m . No injury can be occasioned, then, if the operator accidentally or inadvertently turns the key forcibly to the left. The aperture provided for introducing the key may be normally kept locked by a guard S .

I claim as my invention:

1. In a book having a back and covers flexibly connected to said back, mechanism for removably binding sheets into the back of said book, said mechanism comprising curved metal sheets adapted to turn with their adjacent longitudinal edges around a common shaft, pins carried by one of said curved sheets and hollow pins carried by said other curved metal sheet, the two sets of pins being placed opposite to and adapted to engage each other, a cheek carried by and turning on said common shaft, coiled springs mounted to said common shaft to normally force apart the said cheek and one of the curved metal sheets on the common shaft, a second shaft carried by the said spring-actuated curved metal sheet, flexible means for connecting said second shaft with the said cheek, means for turning said second shaft, and other means for retaining the said second shaft locked in any desired position, substantially as and for the purpose set forth.

2. In a book having a back and covers flexibly connected thereto, mechanism for removably binding sheets into the said back, said mechanism comprising curved metal sheets turning about a common shaft, pins carried by one of said curved metal sheets and hollow pins carried by the opposite curved metal sheet, a cheek carried by and turning on said common shaft, springs mounted to said common shaft, the free ends of said springs acting to force apart the said cheek and one of the curved metal sheets on the common shaft, a second shaft carried in bearings of the said spring-actuated curved metal sheet, flexible means connecting the said second shaft to the said cheek, means for turning the said second shaft, means for locking said second shaft in any desired position, and means for preventing the said second shaft from being excessively turned by its operating key, substantially as and for the purpose set forth.

In testimony whereof, I affix my signature in the presence of two witnesses.

KARL WILHELM HANKE.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.