

1,309,731.

3 SHEETS—SHEET 1.

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

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FIG. 6

FIG. 5

FIG. 7

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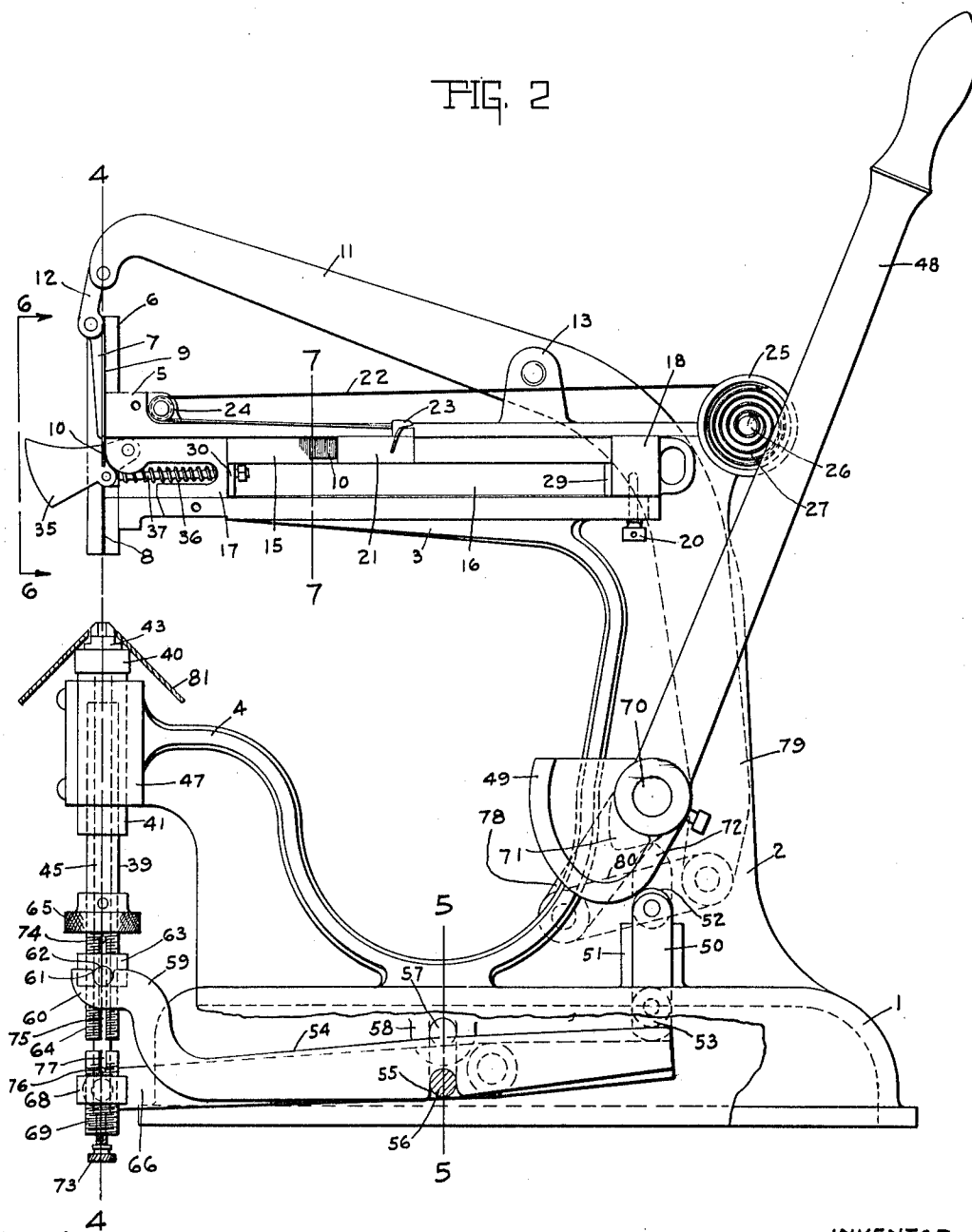
Lockwood & Lockwood
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J. W. HAWKINS.
STAPLE BINDER.
APPLICATION FILED MAY 11, 1918.

1,309,731.

Patented July 15, 1919.
3 SHEETS—SHEET 2.

FIG. 2



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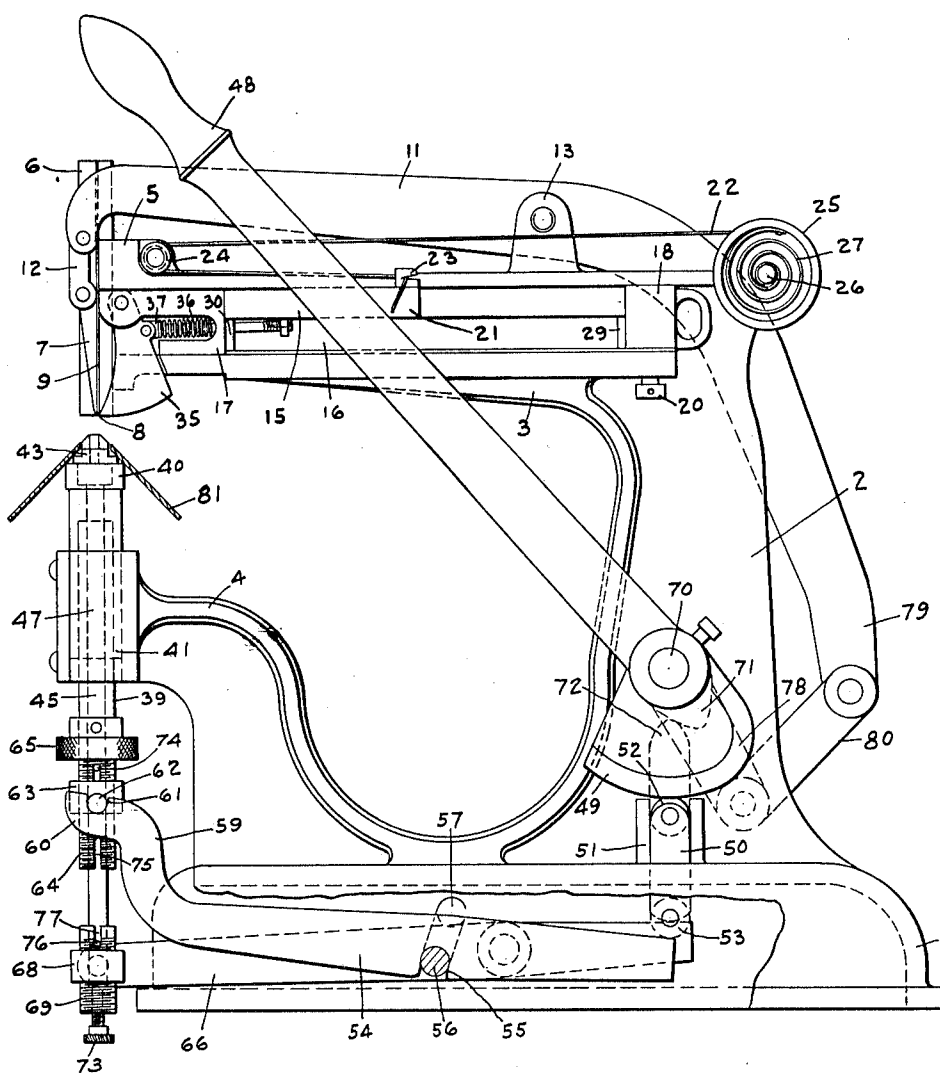
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3 SHEETS—SHEET 3.

FIG. 3



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UNITED STATES PATENT OFFICE.

JOHN WILLIAM HAWKINS, OF KOKOMO, INDIANA.

STAPLE-BINDER.

1,309,731.

Specification of Letters Patent.

Patented July 15, 1919.

Application filed May 11, 1918. Serial No. 233,922.

To all whom it may concern:

Be it known that I, JOHN WILLIAM HAWKINS, a citizen of the United States, and a resident of Kokomo, county of Howard, and State of Indiana, have invented a certain new and useful Staple-Binder; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

This invention relates to staple binders and the prime feature of the invention is the provision of means for driving staples through the folded parts of books, pads and other articles for holding the same in assembled formation.

A further feature of the invention is the provision of means for feeding the staples one at a time from a core or support, into the path of a driving hammer and always maintaining the same in an upright position for driving purposes.

A further feature of the invention is the provision of means for clenching the ends of the staple after it has been applied to use. A further feature of the invention is in the provision of adjusting means for adjusting the work supporting table toward or from the staple receiving head and likewise means for adjusting the clenching mechanism.

A further feature of the invention is the provision of interchangeable parts employed for carrying the driving hammer and also interchangeable parts for guiding the staples in their passage from the core to the point to be engaged by the driving hammer, the requirement for the interchangeable parts being to accommodate staples of varying lengths and widths.

A further feature of the invention is the provision of an operating mechanism for simultaneously elevating the supporting table and lowering the driving hammer, and likewise operating the clenching mechanism, which mechanism may be operated either manually or otherwise.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:—

In the drawings, Figure 1 is a perspective view of the staple binder ready for operation. Fig. 2 is an enlarged side elevation thereof showing parts removed and parts broken away. Fig. 3 is a similar view show-

ing the parts in operative position. Fig. 4 is a vertical sectional view as seen on line 4—4 of Fig. 2. Fig. 5 is a sectional view as seen on line 5—5 of Fig. 2. Fig. 6 is a front elevation of the hammer carrying head as seen from the dotted line and arrows in Fig. 2, and Fig. 7 is a sectional view as seen on line 7—7 of Fig. 2.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the base of a staple driver, extending upwardly from which is a frame 2, one end of the frame having a forwardly extending horizontal section 3, which terminates over an arm 4 at the opposite end of the frame. The forward end of the horizontal section 3 is provided with a head 5, said head having guide bars 6 removably secured therein and between said guide bars is positioned the driving hammer 7.

The inner faces of the guide bars 6 are provided with longitudinally extending channels 8 in which travel the wings 9 of the driving hammer, said channel also receiving and guiding staples 10, while they are being driven by the hammer.

The driving hammer 7 is pivotally attached to one end of a rocking arm 11 by means of a link 12 and as said rocking arm is pivoted between its ends to an ear 13 extending upwardly from the horizontal section 3 of the frame member, so that the hammer 7 will be raised and lowered as the rocking arm is swung on its pivot. The guide bars 6 are held in engagement with the head 5 by means of screws 14 which extend transversely through the bars 6 from the front face thereof and thread into the head 5, so that said guide bars can be quickly removed and interchanged when staples of different sizes are to be used. The front face of the head 5 is provided with a vertically extending channel or recess in which the guide bars 6 are placed, one at each edge thereof, so that the rear face and one edge of the guide bar 6 will rest against the side walls of the recess in the head.

The staples 10 are carried on a horizontally disposed core 15 which enters a slot 16 extending longitudinally of the horizontal section 3, the core being held in position by means of a guide block 17 at the forward end of the core and a lock block 18 at the rear end of the core, the guide block being fixed in the slot 16 by means of screws 19,

while the locking block 18 is held in position by means of a screw 20. The staples 10 are fed into the channels 8, one at a time, by introducing a substantially inverted U-shaped follower 21 over the core 15 at the rear end of the core, said follower being forced against the staples by attaching one end of a cable 22 to an arm 23 extending upwardly from the follower. The cable extends around a sheave 24 adjacent the forward end of the section 3 and then rearwardly into engagement with a winding drum 25, rotatably mounted on a stud 26 at the rear end of the horizontal section 3, the drum 25 being rotated to wind the cable thereon through the medium of a helical spring 27 one end thereof being attached to the stud and the other end to the winding drum.

The core 15, which is channel shaped, is held in place by means of a cover plate 28, fitting over the channel in the horizontal section 3, and by introducing the ends of the core over shoulders 29 and 30 on the blocks 18 and 17 respectively. In removing the core 15, the cover plate 28 is removed and the screw 20 then removed which releases the locking block 18 and by moving said block rearwardly the core 15 can be released from the shoulder 30 on the guide block 17. The core is then removed from the slot 16 and a new core containing a new supply of staples introduced into position, which is accomplished by engaging one end thereof with the shoulder 30 and then moving the locking block 18 into position, and securing it with the screw 20. The follower 21 is then moved to the rear end of the core 15 and introduced thereover, and by returning the cover plate 28 to position the stapling device is ready for use.

In order to permit the staples to pass forwardly into alinement with the channels 8 of the guide bars 6, mandrels 31 are introduced through openings 32 in the head 5 and guide bars 6, said mandrels having ways 33 cut therein which permit the staples to move forwardly until they strike the outer walls of the channels 8, and as staples of different lengths are to be used, the mandrels 31 are interchangeable so that when longer staples are being used, mandrels having longer ways 33 therein are to be introduced into the openings 32, the mandrels being removably held in position by means of screws 34.

The staples are prevented from casually dropping down through the channels 8 by pivotally attaching a guide arm 35 to the forward end of the guide block 7, said guide arm being normally held in horizontal position by means of a spring 36 which extends around a rod 37, said rod being pivoted at its forward end to the guide arm 35 and having its opposite end extended through

the guide block 17, the upper face of the guide arm being preferably curved or concave so that when the staple is forced downwardly by the driving hammer 7, the guide arm 35 will be forced downwardly as the hammer descends, thus permitting the staple to leave the guide arm and pass on through the channels 8.

The staples, as they leave the channels 8, are forced through the articles to be stapled, (not shown), which may be in the shape of books, newspapers, pads, or other forms of devices which are supported upon a platform 38, which platform is carried by a tubular rod 39, said platform resting upon a support 40 having a sleeve 41 thereon which fits over the upper end of the tubular rod 39. The free ends of the staples after they are driven through the article being stapled, are upset or clenched by means of anvils 42 which are pivoted at their outer ends in a retaining member 43 mounted upon the support 40, the inner ends of said anvils having shanks 44 thereon which limit the downward swing movement of the inner ends of the anvils, said anvils being so constructed that they normally rest at a downward inclination, the incline being from the outer to the inner ends of the anvils, whereby when the staples pass through the object being stapled the free ends of the staples will be gradually turned inward toward each other.

The ends of the staple are completely clenched by forcing the inner ends of the anvils 42 upwardly thereby pressing the ends of the staple in close engagement with the lower face of the article being stapled. The anvils 42 are forced upwardly by extending a shaft 45 through the tubular rod 39 and the sleeve 41, the upper end of the shaft having an enlarged head 46 which engages the shanks 44 of the anvil, thus forcing the inner ends of the anvils upwardly when the shaft 45 is elevated.

The sleeve 41 is vertically movable through a bearing 47 attached to the end of the arm 4 so that the sleeve 41 and parts carried thereby may be moved upwardly to properly position the article to be stapled adjacent the lower ends of the guide bars 6.

The tubular rod 39 and the shaft 45 are elevated through the medium of a lever 48 which is operated by hand and is pivotally attached to the vertical portion of the frame 2, although it is to be understood that the device can be operated by foot power, or by motor if desired. The tubular rod 39 is operated by means of a cam 49 which depresses a plunger 50 slidably mounted in a guide-way 51, the upper end of the plunger having a friction roller 52 for engagement with the cam 49, while the lower end thereof is provided with a friction roller 53 for engagement with one end of a rocking lever 54.

The rocking lever 54 is provided with a notch 55 in its lower edge between its ends, said notch fitting over a crank portion 56 of a pivot 57, the ends of the pivot being rotatably mounted in ears 58 depending from the base 1 and by suspending the rocking lever 54 in this manner it may be swung endwise when one end thereof is depressed to elevate the opposite end, thus permitting the elevated end to travel in a substantially vertical line.

The forward end of the rocking lever 54 is provided with an upwardly curved portion 59 and a horizontally extending portion 60, the horizontally extending portion being bifurcated, which bifurcated portions are provided with notches 61 which engage pins 62 carried by a collar 63, said collar being internally threaded for engagement with the external threads 64 on the tubular rod 39.

By threading the collar 63 on to the tubular rod 39, the tubular rod may be adjusted to raise or lower the support 40 with respect to the collar and to more readily accomplish the rotation of the tubular rod a milled disk 65 is fixed to the tubular rod 39.

The shaft 45 is likewise moved upwardly to operate the clenching anvils 42 through the medium of a rocking lever 66, which is pivoted to ears 67 also depending from the base member 1, said lever being pivoted at its outer end to a collar 68 which is threaded on to a sleeve 69, into which the lower end of the shaft 49 extends. The rocking lever 66 is also operated from the lever 48 by extending the pivot pin 70, to which the lever 48 is attached, entirely through the frame 2 and secured to the pivot pin on the opposite side of the frame is a cam 71 which coöperates with the vertically extending plunger 72, likewise slidably mounted through the base 1, the lower end of said plunger resting upon the inner end of the rocking lever 66.

The shaft 45 and the tubular rod 39 may be simultaneously elevated by extending an adjusting screw 73 through the lower end of the sleeve 69, or the shaft 45 may be adjusted independently of the adjusting screw 73 by rotating the sleeve 69. The tubular rod 39 and the shaft 45 are held against independent rotation of each other by extending a pin 74 through the shaft 45 and having one end thereof entering a slot 75 in the tubular shaft 39, while the shaft 45 is held against independent rotation of the sleeve 69 by means of a pin 76 which extends through the shaft 45 and has one end entering a slot 77 in the sleeve 69. By providing the adjusting means as shown for the tubular rod 39, the platform may be adjusted to accommodate articles of various thicknesses and by providing an adjustment for the shaft 45, the degree of bend of the clenched portions of the staple may be regulated.

Simultaneous with the elevating of the platform 38, the rocking arm 11 is operated to lower the driving hammer 7, this being accomplished by attaching a shank 78 to the pivot pin 70 and connecting the opposite end of the shank to the depending end 79 of the rocking arm 11 through the medium of a link 80.

In operation, the article to be stapled is placed upon the platform 38, or if the work to be stapled is in the nature of a book, or article having pages to be turned and opened, that form of platform 81, shown in Figs. 2 and 3 is used, and when so placed the lever 48 is swung from the position shown in Fig. 2 to the position shown in Fig. 3. The forward movement of the lever 48 causes the cam 49 to lower the plunger 50 and consequently operate the rocking lever 54 to elevate the supporting table and parts carrying the same, thereby forcing the article to be stapled against the lower ends of the guide bars 6. During this movement of the lever, the rocking arm 11 is operated to lower the driving hammer 7 which forces the staple 10 downwardly and through the article to be stapled. The lever 48 is then swung rearwardly to its initial position, this operation causing the cam 71 to operate on the plunger 72 and thus force the shaft 45 upwardly through the medium of the rocking lever 66 and causing the anvils 42 to clench the projecting ends of the staple, this operation being performed before the cam 49 has reached a position to release the rocking lever 54.

As soon as the lever 48 has returned to its initial position, the rocking levers 54 and 66 are released, thus permitting the shaft 45 and the parts carrying the work supporting platform to descend and at the same time the rocking arm 11 is operated to elevate the driving hammer 7, whereupon the next succeeding staple will be entered into the channel 8 and in position to be engaged by the driving hammer when it is again lowered. A new article to be stapled may then be placed upon the platform and the previously described operation repeated.

By constructing the device in this manner all of the parts are very compact and at the same time rendered strong and durable and occupy but a small amount of space when positioned ready for use. It will likewise be seen that by forming the guide bars 6 interchangeable with the head 5 and by providing the interchangeable mandrels the same machine may be employed for using staples of various lengths and widths, the driving hammer 7 likewise being interchangeable so as to accommodate the same to the various widths of staples used.

The invention claimed is:—

1. In a staple binder, the combination with a staple carrying frame, and means to feed

- the staples one at a time, of a hammer for driving said staples, guide bars having channels therein to receive said staples and parts of the driving hammer, means to removably attach the guide bars to the frame, mandrels having ways therein for guiding the staples and means for removably attaching the mandrels to the frame and guide bars.
2. In a staple binder, the combination with guide bars, a head for supporting the guide bars, and a staple driving hammer cooperating with said guide bars, of mandrels, and means to removably attach the mandrels to the head and guide bars, said mandrels having ways thereon for guiding the staples.
3. In a staple binder, the combination with a head, of guide bars having longitudinally extending channels, means to removably attach the guide bars to the head, and a staple driving hammer for cooperation with said guide bars to drive the staple entering said channels.
4. In a staple binder, the combination with a frame having a horizontal section and a longitudinal slot in said horizontal section, of a staple carrying core adapted to be entered in said slot, a guide block removably attached in said slot, a shoulder on said guide block for receiving one end of the core, a locking block at the opposite end of said slot, means to removably attach the locking block in the slot, and a shoulder on the locking block for receiving the opposite end of said core.
5. In a staple binder, the combination with a staple driving hammer, and guide bars therefor, of a support, a tubular rod carrying said support, means to vertically adjust said rod and support, clenching anvils carried by said support, means for moving the support and the article being stapled in juxtaposition to the guide bars, means to force the clenching anvils upwardly to clench the ends of the staple, and means to simultaneously force the driving hammer downwardly.
6. In a staple binder, the combination with a frame, guide bars attached thereto, and a staple driving hammer, of an article receiving platform, a support for said platform, a tubular rod rotatably attached to said support, means for vertically adjusting said tubular rod and support, a pair of clenching anvils carried by the support, a shaft extending through the support and tubular rod, means to adjust the shaft vertically, means to elevate said tubular rod and parts carried thereby to position the article to be stapled adjacent the guide bars, and means to elevate said shaft for operating the clenching anvils.
7. In a staple binder, the combination with a frame and a staple driving hammer carried thereby, of an article supporting platform, a support for said platform, a tubular rod rotatably attached to said support, clenching anvils carried by the support, a shaft extending through said tubular rod, and a support for operating the clenching anvils, means to move said tubular rod and support and article supporting platform upwardly, means to simultaneously lower the driving hammer, and means for moving said shaft upwardly to operate the clenching anvils.
8. In a staple binder, the combination with a frame, guide bars carried by the frame, and a staple driving hammer carried by the guide bars, of a support movably mounted on said frame, a tubular rod rotatably attached to said support, means to rotate said tubular rod to adjust the same vertically, a shaft extending through said tubular rod and support, a thimble at the lower end of said shaft, means carried by the thimble for adjusting said shaft, means to hold said shaft and tubular rod against rotation independently of each other but permitting vertical movement independently of each other, clenching anvils carried by said support, means to move the tubular rod and support upwardly, and additional means to elevate the shaft for operating the clenching anvils.
9. In a staple binder, the combination with a support, and a rod carrying the support, of a rocking lever, one end of which is pivotally connected with said rod, a swinging pivot supporting said rocking lever between its ends, and means to depress the other end of said rocking lever for elevating the opposite end thereof and raising the tubular rod and support carried thereby, the upwardly moving end of said lever traveling in a substantially straight line.
10. In a staple binder the combination with a frame having a horizontally slotted section, of a staple containing core entered in the slot of said horizontal section, a guide block at the forward end of said core, a guide arm pivoted to said guide block, adapted to prevent the casual downward movement of the staple when entered over said guide arm, a rod pivoted to said guide arm, and a spring surrounding said rod between the guide arm and guide block for normally holding the guide arm in horizontal position.
11. In a staple binder, the combination with a frame, a base supporting the frame, a staple driving hammer movable through parts of the frame, and a rocking arm pivoted between its ends to said frame and at one end to said staple driving hammer, of a supporting member, a tubular rod connected with the supporting member, clenching anvils pivoted to the support, a shaft for operating said anvils, a pivot pin extending transversely through said frame, a

lever fixed to said pivot pin, a cam carried by said lever, a pivotally mounted longitudinally movable rocking lever having one of its ends in connection with said tubular rod, 5 a plunger between the opposite end of said rocking lever and the cam for depressing the rocking lever when the cam is rotated, a second cam on said pivot pin at the opposite side of said frame, a second pivotally 10 mounted rocking lever, means to pivotally connect one end of said second rocking lever to the anvil operating shaft, a plunger cooperating with the second cam for depressing the free end of the second rocking 15 lever, and means to pivotally connect the rocking arm to said pivot pin, whereby when the cam operating lever is moved to operate the cam, the rocking arm will be simultaneously operated to lower the staple 20 driving hammer.

12. In a staple binder, the combination with a frame having a horizontally disposed slotted section, of a staple carrying core adapted to enter said section, a guide block 25 at one end of said slot, a shoulder on said

guide block for engagement with one end of said core, a locking block, a shoulder thereon for engagement with the opposite end of said core, and means to removably 30 secure the locking block in position whereby the core will be held within said slot.

13. In a staple binder, the combination with a frame having a horizontally disposed slotted extension, of a guide block at the forward end of said slot, a shoulder on 35 said guide block, a locking block at the opposite end of said slot, a shoulder on said locking block, means to removably secure the locking block in position, and a channel 40 shaped staple carrying core adapted to enter said slot and having its ends engaged with said shoulders.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

JOHN WILLIAM HAWKINS.

Witnesses:

M. E. LOUTH,
W. R. HURLEY.