

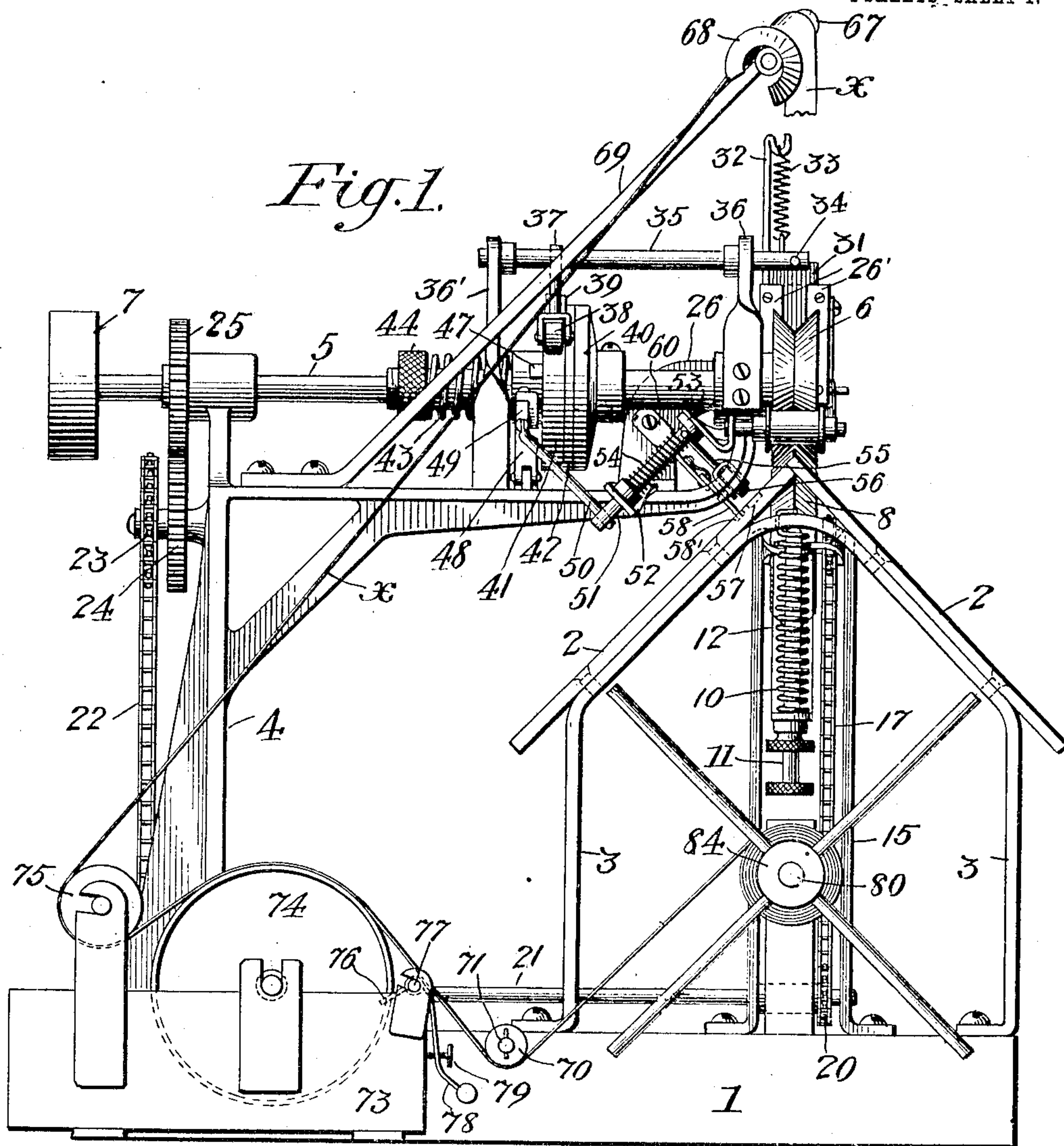
No. 871,821.

PATENTED NOV. 26, 1907.

W. H. REISNER, S. C. SWARTZ & W. T. HAMILTON.  
MACHINE FOR APPLYING BINDING STRIPS TO BOOKS.

APPLICATION FILED JAN. 18, 1907.

4 SHEETS—SHEET 1.



Witnesses

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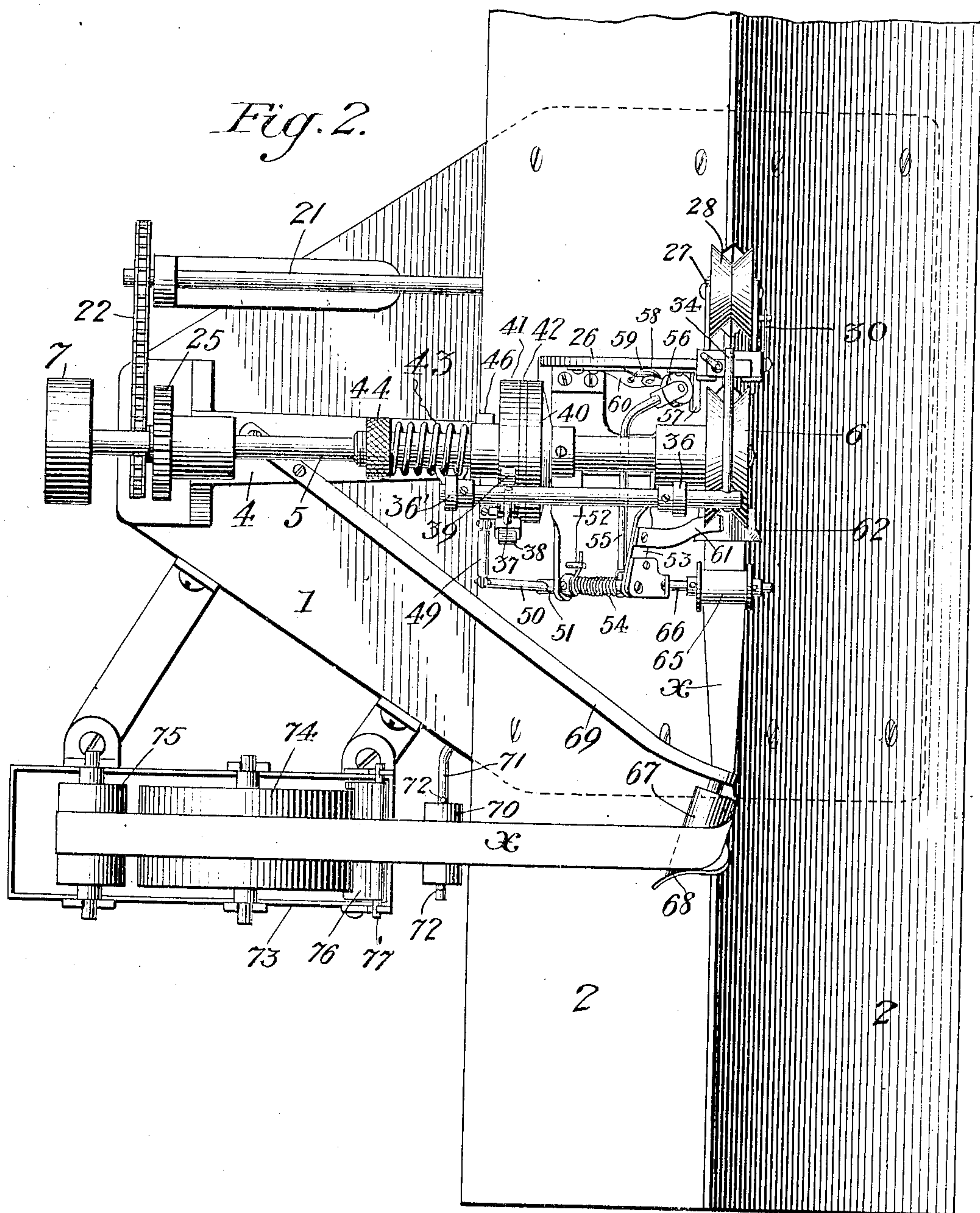
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4 SHEETS—SHEET 2.



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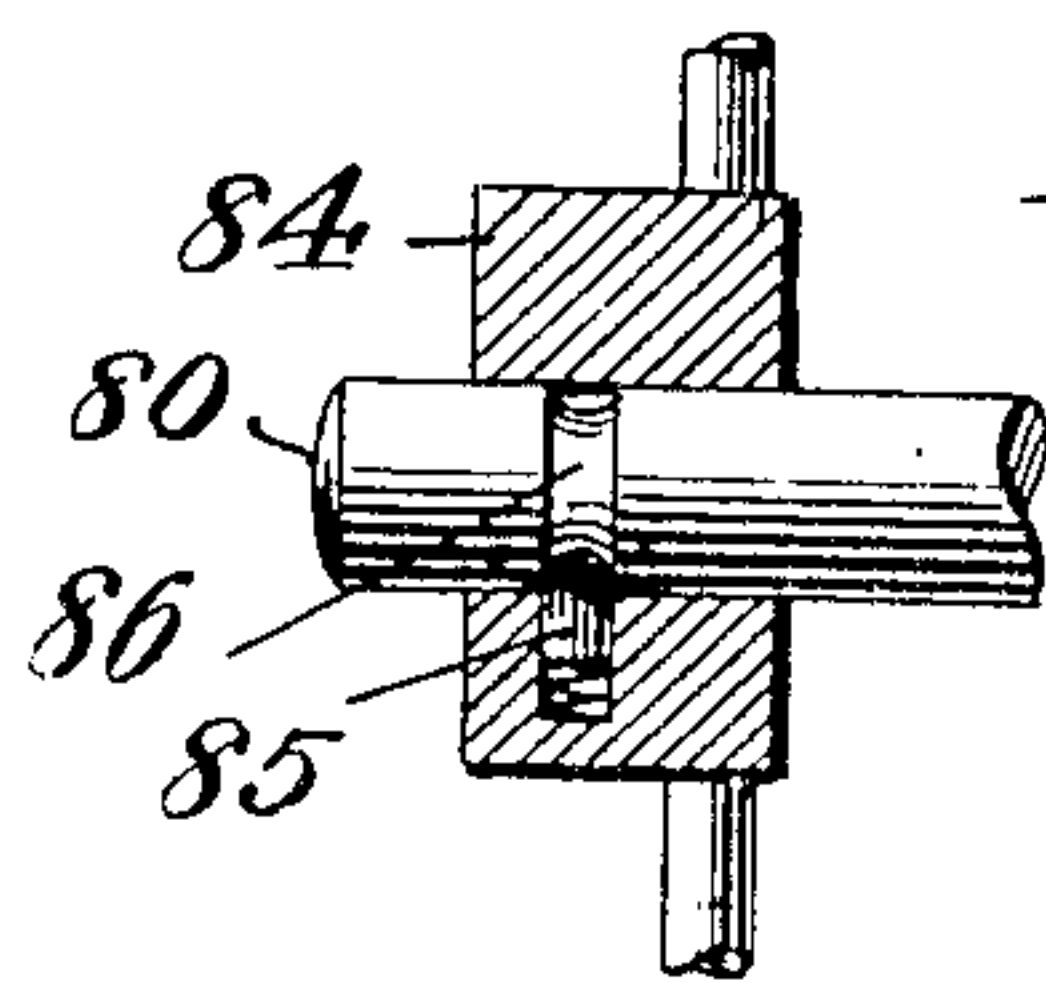
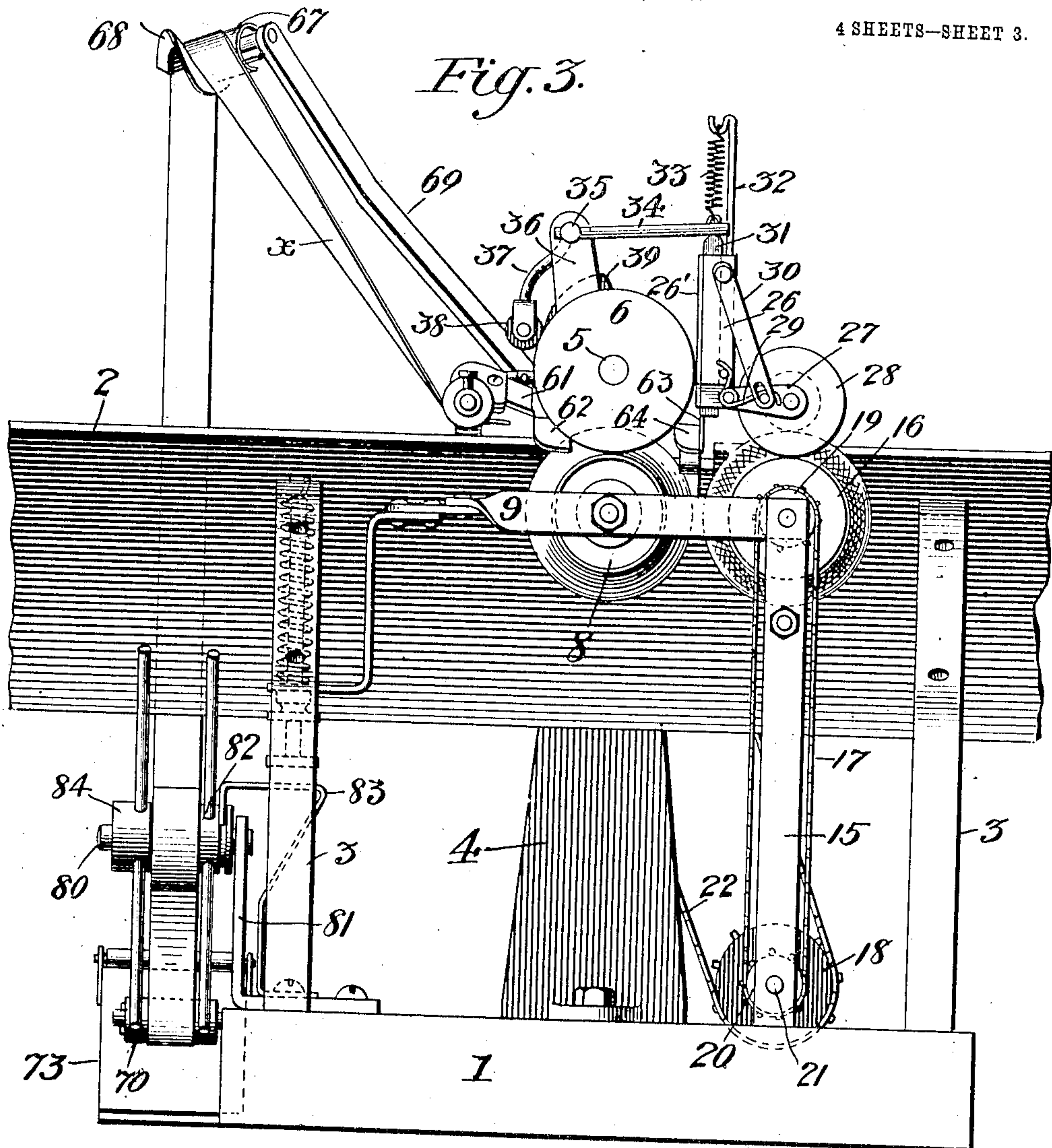
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4 SHEETS—SHEET 3.



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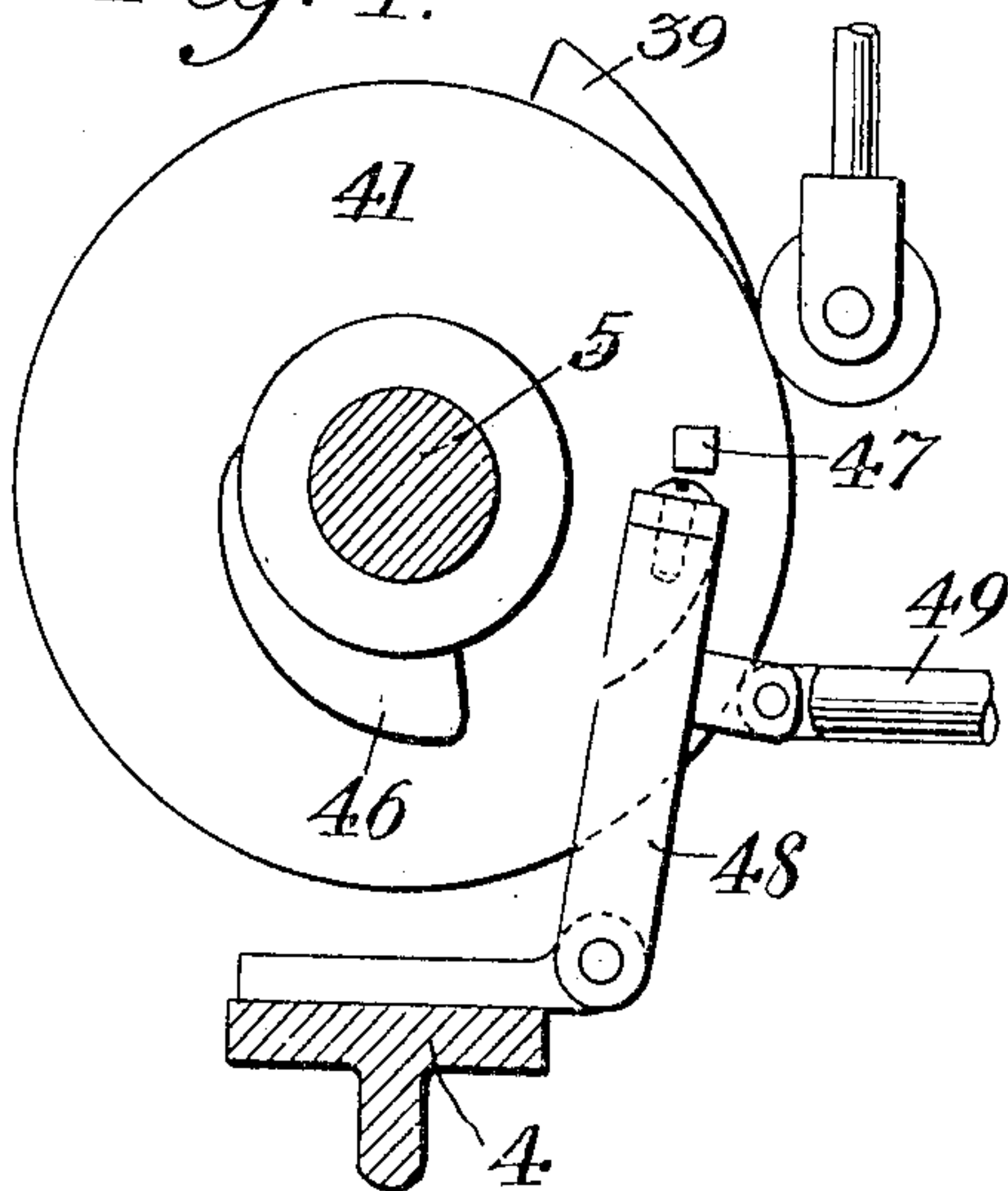
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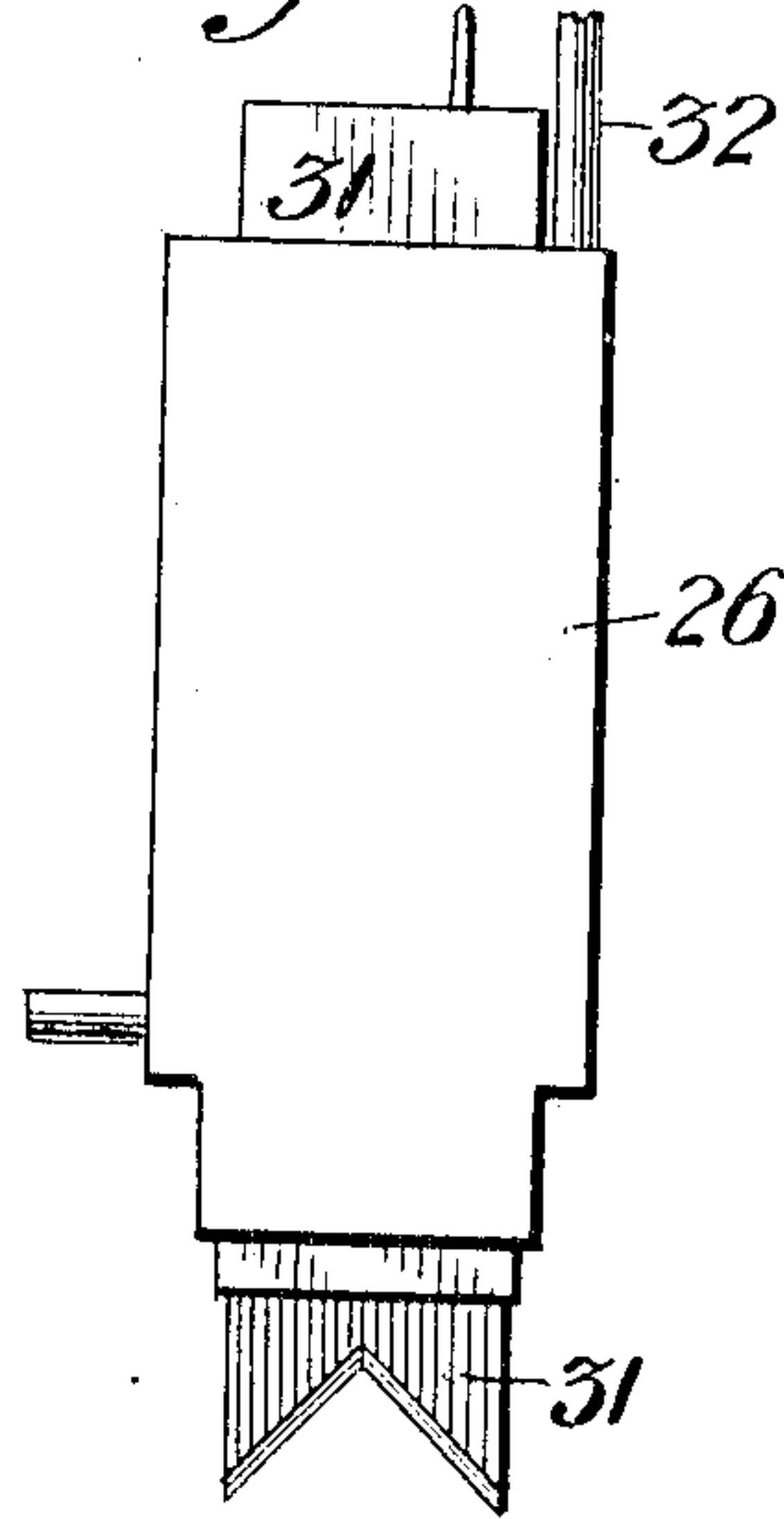
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4 SHEETS—SHEET 4.

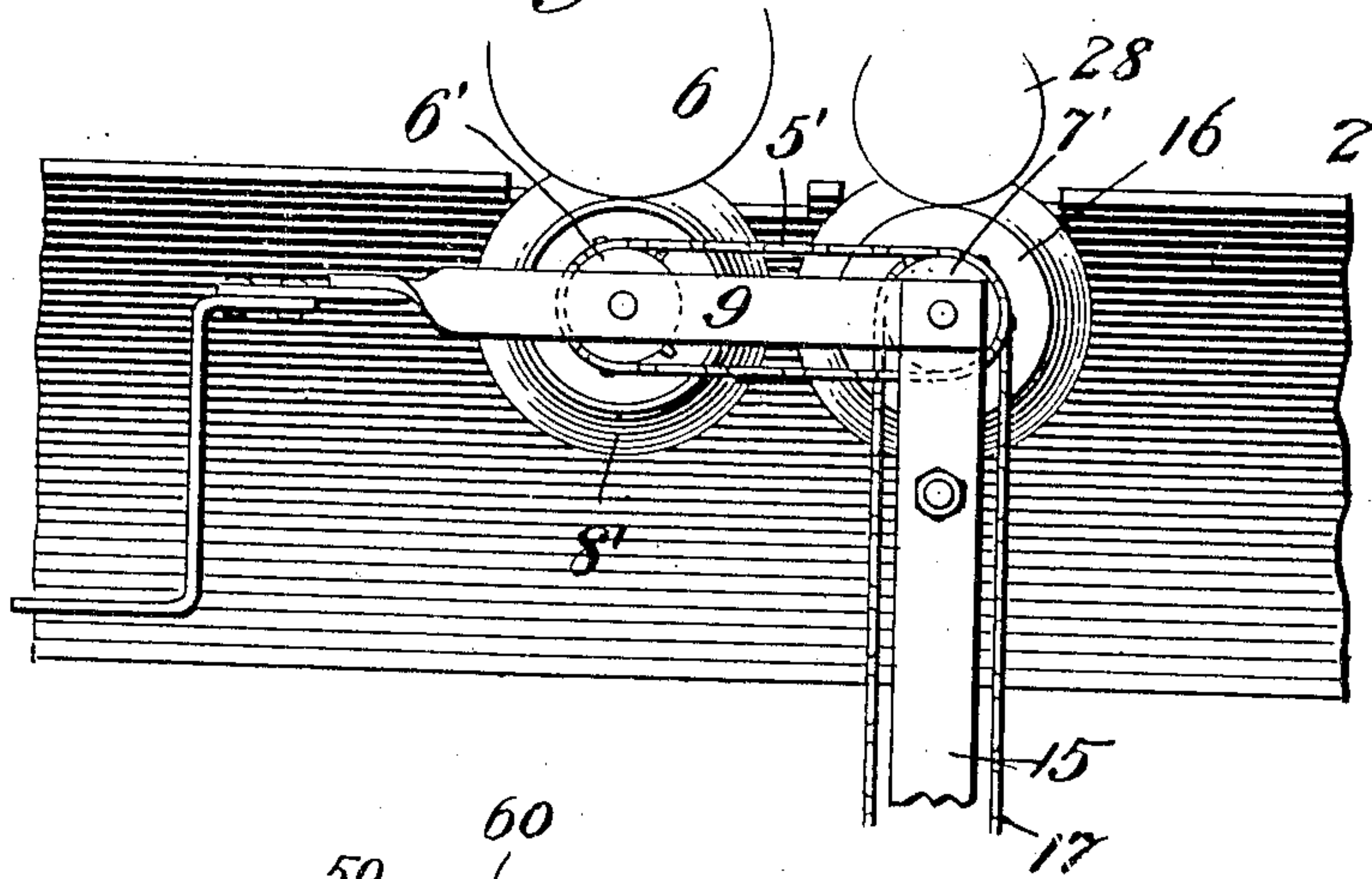
*Fig. 4.*



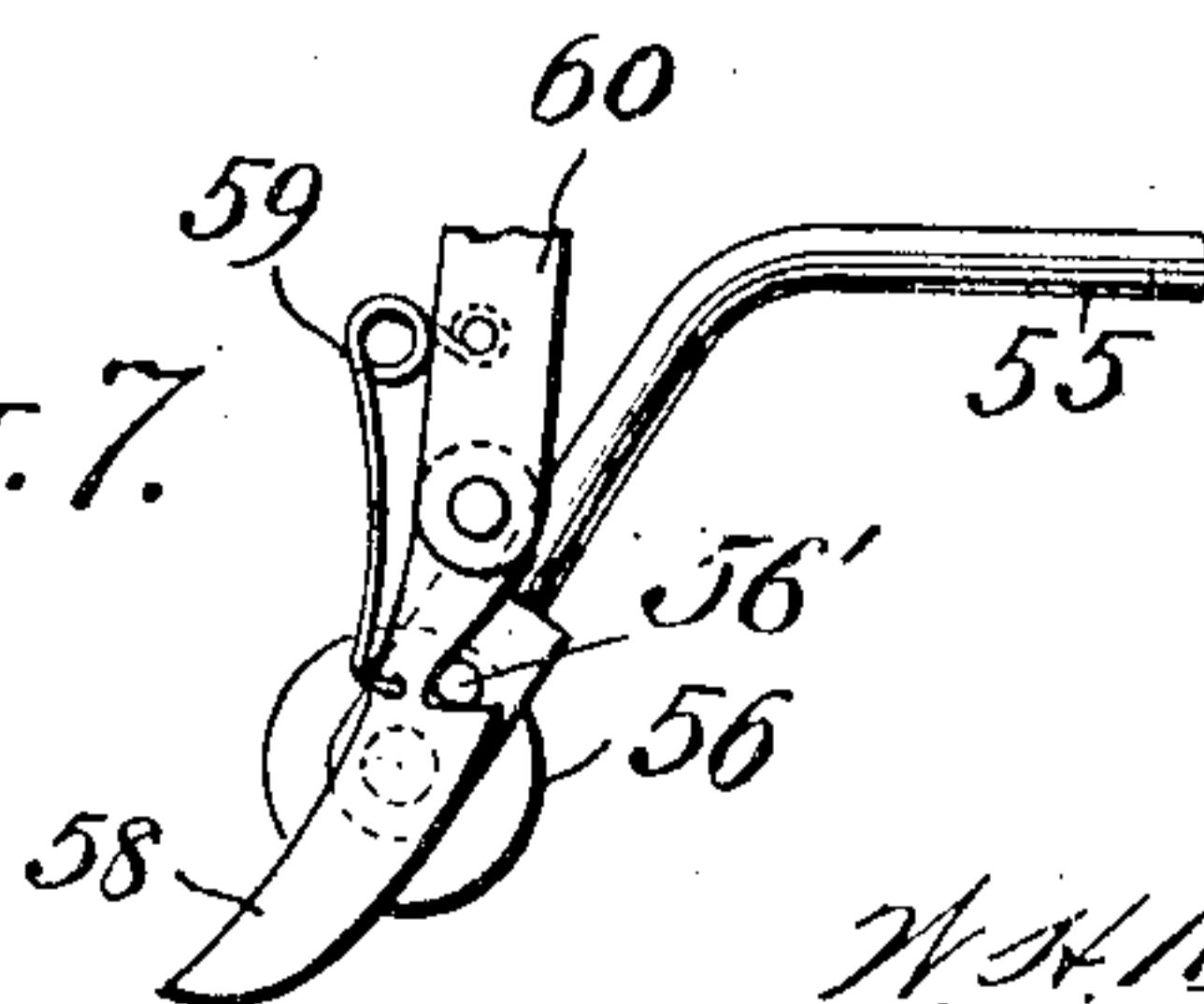
*Fig. 5.*



*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

WILLIAM H. REISNER, SEWELL C. SWARTZ, AND WILLIAM T. HAMILTON, OF HAGERSTOWN,  
MARYLAND.

## MACHINE FOR APPLYING BINDING-STRIPS TO BOOKS.

No. 871,821.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed January 18, 1907. Serial No. 352,946.

*To all whom it may concern:*

Be it known that we, WILLIAM H. REISNER, SEWELL C. SWARTZ, and WILLIAM T. HAMILTON, citizens of the United States, residing at Hagerstown, county of Washington, and State of Maryland, have invented certain new and useful Improvements in Machines for Applying Binding-Strips to Books; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for applying or affixing binding strips, of paper, muslin or the like, to the backs of books or similar articles and has for its object to provide a greatly simplified and highly efficient mechanism for accomplishing the object aforesaid.

To this end the invention comprises means for supporting and feeding the books to be bound, in partly opened position while the strip of paper, muslin or the like, which has been coated with adhesive is applied and secured to the backs of the books, as said books, together with the strip are passed through coacting feed rollers, one of which is provided with a convex periphery engaging the inner side of the book at the fold and the other having a concave periphery engaging the back of the book and serving to fold and force the pasted strip into contact with the book back. For the purpose of accurately severing the binding strip at the rear edge of the book the mechanism is provided with a strip-cutting knife, operated from the driving mechanism, but held inoperative, at all times, except when a book is just leaving the feed rollers. These, and other novel features of the invention, will be more particularly set forth in the following specification and claims, and are illustrated in the accompanying drawings in which—

Figure 1 is an end elevation of a complete machine; Fig. 2 is a plan view thereof; Fig. 3 is a side elevation with one-half of the book-supporting table removed, to show the relative arrangement of the operating mechanism; Fig. 4 is a detail view of the knife actuating cam and stop mechanism; Fig. 5 is an enlarged elevation of the strip-cutting knife and its housing; Fig. 6 is a view, corresponding generally to Fig. 3, showing a

modified form of drive for the feed rollers; 55 Fig. 7 is an enlarged detail view of the trip for controlling the operation of the knife; Fig. 8 is a detail showing the mode of securing one member of the strip carrying roll in position.

Referring to the drawings, 1 indicates the base of the machine which may be of any suitable shape or size and is illustrated merely conventionally in the present instance. Supported by suitable standards 3, on said base is a table or frame upon which the books are placed, and over which they are moved during the operation of applying the strips to the backs thereof. It has been found that if the books are only partially opened so as to present the backs thereof as an inverted V to the mechanism for applying the binding strip to the back, the mechanism for effecting the operation may be greatly simplified and the operation itself materially expedited. To this end the table or support consists of two transversely inclined plates 2—2, preferably of metal having the form of an inverted V, to support the book in partly opened relation and present the back thereof to the strip affixing feed wheels.

Mounted adjacent to the apex of the inverted V-shaped table are the main feed rollers 6 and 8 which serve not only to pass the books through the machine but, also, to suitably crease or fold the adhesive strip and apply the same to the back of the partially opened book. The feed roller 8 which is mounted below the table projects slightly above the apex of the table, through a suitable opening therein and the periphery of said feed roller is convexed or tapered to conform generally to the contour of the table sides 2—2. The periphery of roller 6 is provided with a corresponding V-shaped cavity, so that the peripheries of the two rollers normally engage and cooperate with each other in the operation of feeding the books and applying the strip to the backs thereof.

Roller 6 is mounted upon a counter-shaft 5 which is journaled in suitable bearings on a bracket or standard 4, secured to the base of the machine and said shaft is conveniently provided with a drive pulley 7, by means of which power is applied to the machine.

The roller 8 is journaled in a swinging bracket 9, one end of which is pivoted in ver-



tical standards 15, secured to the base 1 and the other end is attached to a helical spring 10, connected at its upper end to one of the standards 3. Said spring 10 therefore tends to throw roller 8 into close engagement with roller 6, but permits the said roller to move downward when a book is passed between the two rollers 6 and 8. In order to adjust the tension on the roller 8, the set screw 11 is tapped through the angular end of the bracket 9 and engages with its upper end a stationary abutment, such, for example, as the under side of standard 3, so that by adjusting said screw the tension of the spring and, consequently, the bearing contact between the feed rollers 6 and 8 may be nicely adjusted. Mounted upon the axis of the swinging bracket 9 is a second feed roller 16 provided with a generally convex periphery of the same character as that of roller 8, and, if desired, the convex surface of said rollers may be knurled or roughened to increase the driving friction and insure an even steady feed of the books. Roller 16 is positively driven by means of a sprocket wheel 19, fixed to the axis thereof, which is engaged by a sprocket chain 17, cooperating with a driving sprocket wheel 20, mounted upon a counter-shaft 21, which, in turn, is driven through sprocket wheel 18, chain 22, sprocket wheel 23, pinion 24, and gear 25, the latter being fixed to the shaft 5.

Cooperating with the roller 16, which projects through a suitable opening in the apex of the table, is a feed roller 28, having a convex periphery of the same general character as that of roller 6, and said rollers 16 and 28 cooperate to continue the feeding and pasting operation with respect to the books, as the latter are delivered from the main feed rollers 6 and 8. The upper auxiliary feed roller 28 is mounted in swinging links 27 which are pivoted to a bracket 26 forming a lateral extension from the main bracket or standard 4. In order to hold roller 28 in firm, yet yielding, contact with roller 16, springs 29 mounted upon the bracket 26 bear with their free ends upon the swinging links 27—27. In order to prevent the roller 28 from swinging too far downward, a fixed link 30, attached to the bracket 26, has a pin and slot engagement, at its lower end with one of the swinging links 27, which permits the roller 28 to move up and down within the limits defined by the slot in said link 30.

Mounted immediately in the rear of the feed rollers 6 and 8 is a strip-cutting knife 31 having a lower cutting edge notched to conform to the angular relation of the table sides 2—2. The knife 31 is mounted in a guide head forming the end of bracket 25 and is held in position by means of removable face plates 26'. Normally the knife is held in retracted position by a spring 33 secured to the hooked end of the rod 32 mounted on the

head of bracket 26. It is intended that knife 31 shall be operated to sever the binding strip close up to the rear edge of the book as the latter leaves the feed rollers 6 and 8 and to accomplish this purpose there is mounted upon shaft 5 a cam 39 which engages roller 38 connected to a rock shaft 35 mounted in brackets 36' secured to main bracket 4, said rock shaft 35 having an arm 34 projecting therefrom and engaging the top of the knife to force the latter downward as cam 39 moves rock shaft 35. It is essential, of course, that the knife be not operated to sever the strip until the book passes out of engagement with feed rollers 6 and 8 and means are therefore provided for holding the knife actuating means inoperative until passage of the book from between said rollers 6 and 8 permits the knife operating cam to exercise its function. To effect this the cam 39 is mounted upon a disk 41 loosely mounted upon shaft 5, but adapted to be rotated with shaft 45, except when positively restrained, by means of a friction disk 42, preferably of leather or the like, which engages the face of cam disk 41, and is positively attached to the corresponding face of a drive disk 40, keyed to and positively driven from shaft 5. Said disks 40 and 41 with the interposed friction member 42 constitute an effective friction clutch when said disk 41 is held in contact with the intermediate friction member 42 by means of helical spring 43, surrounding the shaft 5 and bearing between the hub of disk 41 and an adjustable collar 44 screwed upon shaft 5. The pressure exerted by spring 43 between cam disk 41 and the friction member 42 of disk 40 may be regulated by the adjustable collar 44. Unless disk 41 is positively restrained, the frictional engagement between the same and disk 40 will cause said disk 41 to rotate so that cam 39 will actuate rock shaft 35 and reciprocate knife 31 once for each rotation of shaft 5. To prevent cam disk 41 being rotated except at the proper time, it is provided on one face with a pin 47 adapted to engage a detent or stop 48 which is pivoted to the bracket 4. Said detent 48 is connected by a short link 49 with an arm 50 projecting from the end of a short rock shaft 51 mounted in brackets 52, 53, secured to the standard 4. Secured to the rock shaft 51 is an arm 55 carrying at its end a roller 56 which normally occupies a slight depression 57 in the table 2, a spiral spring 54 surrounding shaft 51 and engaging arm 55 and bracket 52, respectively, normally tending to force said trip arm 55 toward the table and simultaneously to move said stop or detent 48 out of the path of movement of pin 47. When, however, a book is passed between the rollers 6 and 8, roller 56 engaging one of the covers of the book will be lifted, thereby moving said rock shaft 51 against the tension of spring 54, and



swinging detent 48 outward until its upper end lies directly in the path of movement of pin 47 on disk 41 which arrests the rotatory movement of said disk 41 and prevents cam 31 further operating the knife actuating mechanism. This relation of the parts is maintained as long as the book lies under roller 56, but, as soon as the book passes out of engagements with said roller, the latter drops, under tension of spring 54, and detent 48 moves out of engagement with pin 47, and rotatory motion is again imparted to disk 41, thereby causing cam 39 to actuate knife 31 to sever the strip.

During the intervals between the successive books, to which the strip is to be applied, it will, of course, be desirable to prevent the knife being operated for the reason that, if it were operated, it would necessarily cut off short lengths of the strip which would be wasted. To hold the knife inoperative, therefore, when no book is between rollers 6 and 8 and under roller 56, there is provided on the hub of disk 41 a cam 46 which engages the side of stop or detent 48 moving the same outward, rocking shaft 51 and elevating trip arm 55. As said arm 55 is elevated by this means, a pin 56' projecting laterally from the end of said rod, adjacent the roller 56, engages a hook or latch 58, which is pivoted to an arm 60 rigidly secured to bracket 26, which hook supports the trip arm and prevents its return into engagement with the table. The pivoted hook 58 is engaged by a spring 59, secured to arm 60 which normally tends to move the lower end of said hook into engagement with a slight groove or depression in the table 2 and also tends to force the hook into engagement with pin 56 when said hook is lifted by the elevation of trip arm 55. When said hook 58 is engaged by the pin 56' to support the trip arm 55, its lower end lies substantially in the plane of table-top 2 and when a book is passed between rollers 6 and 8 it strikes the lower end of hook 58 and swings said hook to disengage it from pin 56, thereby permitting trip lever 55 to fall until the roller 56 engages the side or cover of the book. It will thus be seen that the knife is actuated but once for each book that is passed through the machine and then only when the book passes out of engagement with roller 56 on trip arm 55, which permits the latter to fall and move detent 48 out of the path of movement of pin 47 to permit cam disk 41 to operate the rock shaft 35 which actuates knife 31. Immediately after the knife has been actuated, cam 46 moves detent 48 outward to throw trip arm 55 upward and lock the same in this position by means of hook or latch 58.

The strip is fed from a roll mounted upon a suitable reel journaled upon a pintle 80 mounted in a standard 81 secured to the base 1. The reel consists of a main hub

82 provided with cross-arms, and an auxiliary hub 84. The main hub is held in position on the pintle 80 by means of a brake spring 83 which engages a peripheral groove in one end of the hub. The removable hub 84 with its cross arms is detachably secured to the pintle by means of spring-pressed pin 85 located in the hub and adapted to engage a circumferential groove 86 near the end of the pintle. By exercising a slight pull axially on said hub 84 the pin 85 is forced outwardly and said hub may be slipped off, and, conversely, by forcing the hub 84 in the opposite direction the pin 85 will be retracted until it comes into registry with grooves 86 when it will lock the hub in position. It will be apparent that the ready removability of the hub 84 makes it easy to renew a roll of binding strip.

From the reel the strip is led over a guide roll 70 mounted upon a pintle 71 secured to the base 1 and confined in position by cross pins 72. Thence the strip passes over a paste roll 74 which is journaled in a paste box 73; from 74 the strip passes under a second guide roll 75, thence upward to a stationary guide, comprising a generally cylindrical sleeve 67 mounted upon a bracket arm 69 and provided at its outer end with a generally helical guide flange 68 which directs the strip downward and also gives it the necessary twist to produce complete reversal of the strip to bring the pasted side downward as it passes under the final guide roll 65 mounted upon a pintle 66 secured to bracket 53. In order to give the strip a preliminary set before it is engaged by the feed rollers 6, a guide 62 of an inverted V-shape is supported by a rigid arm 61, immediately in front of and below feed roller 6. A generally similar guide 64 is located immediately behind the rollers 6 and 8 and just ahead of the knife 31.

In order to secure an even distribution of paste or other adhesive by roll 74, there is provided a scraper 76 pivotally mounted in the forward part of the paste box 73 and provided with a counter-weight 78 which tends to force the scraper against the periphery of roll 74. The proximity of scraper 76 to the periphery of the roll may be nicely adjusted by means of a set screw 79 in the arm of counter-weight 78, which set screw bears against the end of the box.

Power is imparted to the machine by way of pulley 7 which drives shaft 5 and counter-shaft 21 continuously, thereby causing the feed rollers 6 and 8, 16 and 28, to rotate. Normally and until the first book is fed between the rollers 6 and 8 far enough to lift latch 58 and roller 56 away from the table, the knife operating mechanism is held inoperative. The books are partially opened and laid face downward on the inclined table sections, so that the backs lie along the ridge formed by the meeting of the table sections.



The binding strip having been laid over the several guide rolls, the pasting wheel and between the feed rollers 6 and 8, the first book is shoved forward until it engages the forward feed rollers 6 and 8. The latter yields sufficiently to accommodate the thickness of the book, but, nevertheless, exerts sufficient pressure to feed the book forward and, inasmuch as the back of the latter engages the under or gummed side of the binding strip, the latter is also fed forward with the book. The concaved periphery of roller 6 imparts the necessary crease or fold to the strip and forces the strip into firm contact with the back of the book. As the book is advanced by rollers 6 and 8, the feeding operation is taken up by rollers 16 and 28. As the rear edge of the book passes from between rollers 6 and 8 and also passes out of engagement with roller 56, the latter falls into the notch or recess 57 permitting the spring 54 to move stop or detent 48 out of the path of movement of pin 47, thereby permitting disk 41 to be driven by disk 40 and to positively rock the shaft 35 and advance knife 31 to sever the strip immediately at the rear edge of the book. Cam 46 immediately thereafter rocks detent 48 forward and elevates trip arm 55 until the pin 56' engages latch 58 which again locks disk 41 and prevents further actuation of the knife until another book is fed into the machine.

It will be apparent that instead of making feed roller 6 the driving member the lower feed roller 8 may be made the driver. Such an arrangement is illustrated in Fig. 6, wherein the lower feed roller 8' is positively driven by sprocket and chain gearing 5'-6'-7' from the shaft of feed roller 16.

What I claim is:—

1. In a machine for applying binding strips to the backs of books, the combination of an inverted V-shaped table to support a book in partly opened relation, means for feeding the books longitudinally of said table and simultaneously applying the strip to the backs thereof, and means for severing the strip at appropriate intervals.

2. In a machine for applying binding strips to the backs of books, the combination of an inverted V-shaped table to support a book in partly opened relation, coacting feed rollers for advancing the books longitudinally of said table and simultaneously applying the strip to the backs thereof, and means for severing the strip at appropriate intervals.

3. In a machine for applying binding strips to the backs of books, the combination of an inverted V-shaped table to support a book in partly opened relation, coacting concave and convex feed rollers adjacent the intersection of the table sides for advancing the books longitudinally of said table and simultaneously applying the strip to the

backs thereof, and means for severing the strip at appropriate intervals.

4. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip, an inverted V-shaped table, feed rollers located at the apex of said table for advancing the books and applying the strip to the backs thereof, a knife for cutting the strip at the edge of the book, mechanism for actuating said knife, and means controlled by the presence of a book between the feed rolls to render the knife actuating mechanism inoperative.

5. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip, an inverted V-shaped table, two sets of feed rolls located at the apex of said table for advancing the books and applying the strip to the backs thereof, a reciprocating knife between the sets of rolls for cutting the strip at the rear edges of the books, mechanism for actuating said knife and means controlled by the presence of a book between the forward feed rolls to render the knife actuating mechanism inoperative.

6. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip, a support for the books, and means for feeding the books and applying the strip to the backs thereof including a roller having a convex periphery for engaging the inside of a book and a coacting roller having a concave periphery for engaging the back of a book to fold and secure the strip thereto.

7. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip and means for simultaneously feeding a book and an appropriate length of pasted strip to bind the back of said book, said means comprising two rolls having coacting convex and concave peripheries respectively.

8. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip, an inverted V-shaped table, coacting concave and convex feed rollers located adjacent the apex of said table for advancing the books and applying the strip to the backs thereof, a knife for severing the strip, means for actuating said knife as each book leaves the rolls and means for rendering the knife actuating means inoperative at other times.

9. In a machine for applying binding strips to the backs of books, the combination of means for feeding the books and securing the strip to the back thereof, a knife for severing the strip, a cam operated by the feeding mechanism for moving said knife, a trip engaged by a book to prevent the operation of said cam until the book passes the feeding means, means operated by the feed-



ing means to lift the trip after each cutting operation and means for holding the trip in raised position, said latter means being operated by the passage of a book to release the trip.

10. In a machine for applying binding strips to the backs of books, the combination of means for feeding the books and securing the strip to the back thereof, a strip-cutting knife, an actuating cam for said knife operated by the feeding mechanism, a trip engaged by a book to prevent the operation of said cam until the book passes the feeding mechanism, a second cam operated by the feed mechanism to lift the trip after each cutting operation, and a latch for holding the trip in raised position, said latch being thrown by a book to release the trip.

11. In a machine for applying binding strips to the backs of books, the combination of means for supplying the pasted strip,

an inverted V-shaped table, cooperating convex and concave feed rollers adjacent the apex of said table, a strip-cutting knife adjacent said rollers, an actuating cam for said knife operated by the feeding mechanism, a trip engaged by a book to prevent the operation of said cam until the book passes the feeding mechanism, a second cam operated by the feed mechanism to lift the trip after each cutting operation, and a latch for holding the trip in raised position, said latch being thrown by a book to release the trip.

In testimony whereof we affix our signatures, in presence of two witnesses.

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SEWELL C. SWARTZ.  
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