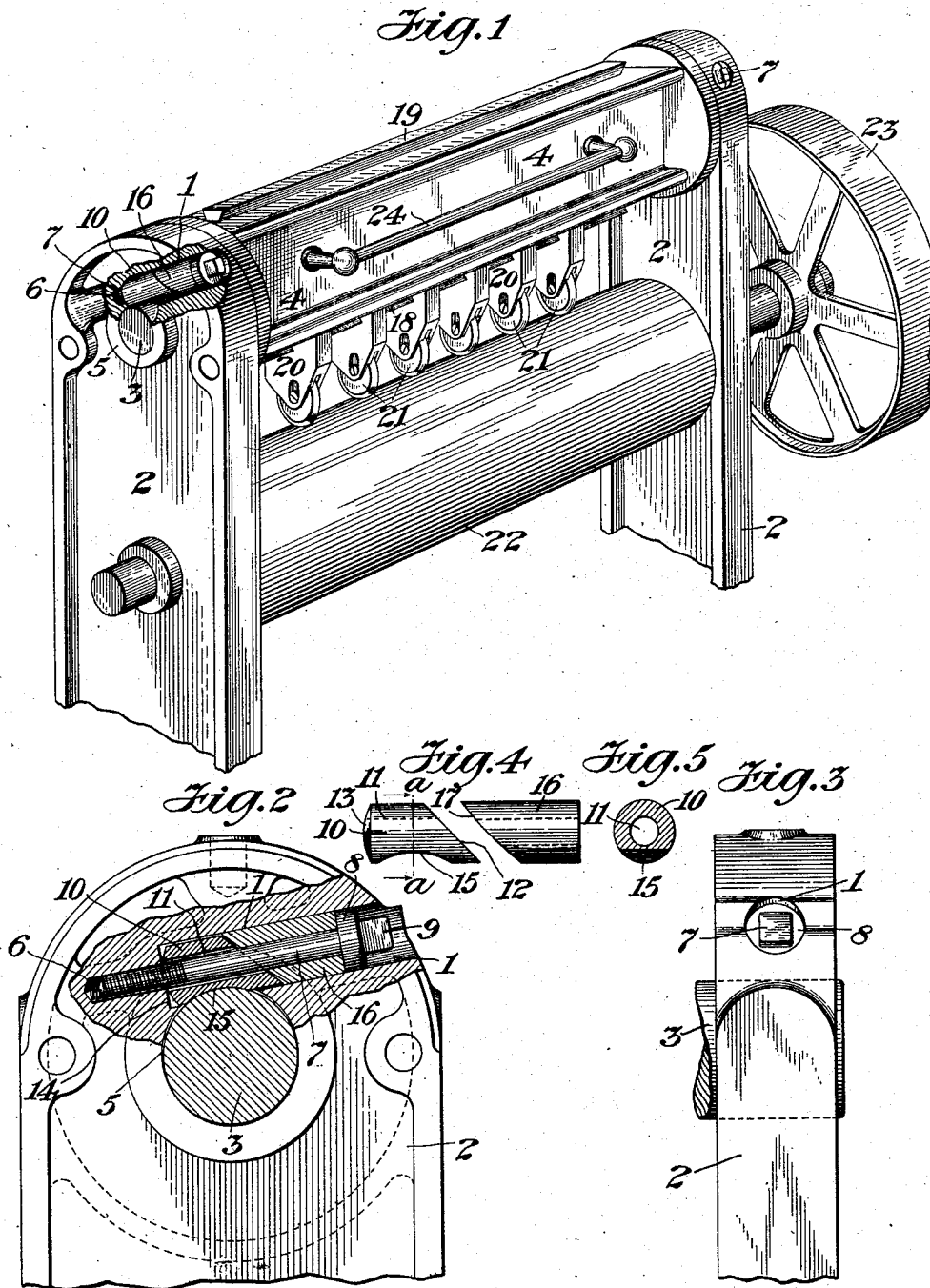


J. G. JONES.
 FRICTIONAL LOCKING DEVICE.
 APPLICATION FILED JULY 19, 1906.

974,156.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 1.



Witnesses
Chas. Claggett
M. E. Stanton

Inventor
J. G. Jones
 By his Attorney
Chas. H. Jones

J. G. JONES.
 FRICTIONAL LOCKING DEVICE.
 APPLICATION FILED JULY 19, 1908.

974,156.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 2.

Fig. 7

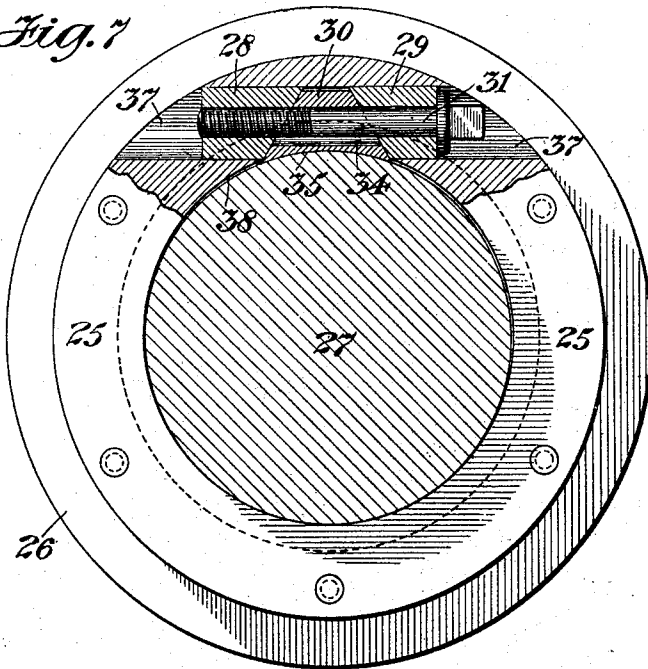


Fig. 8

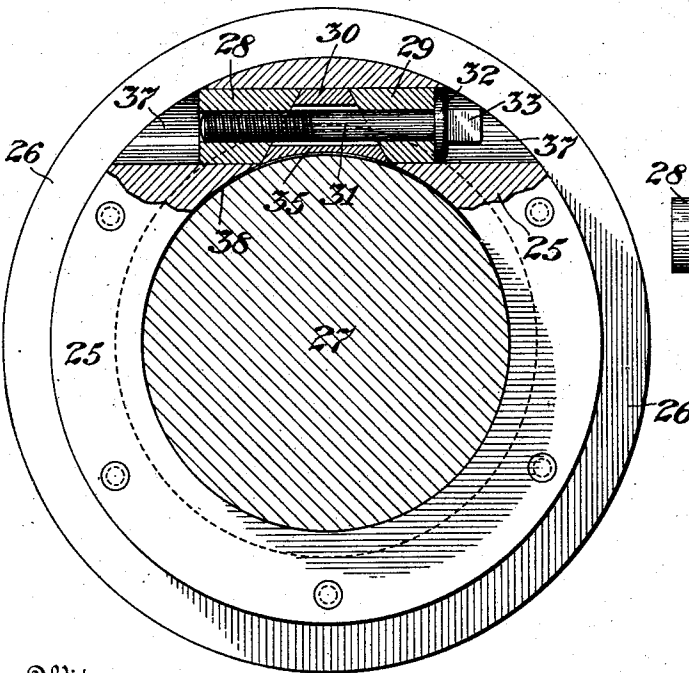


Fig. 6

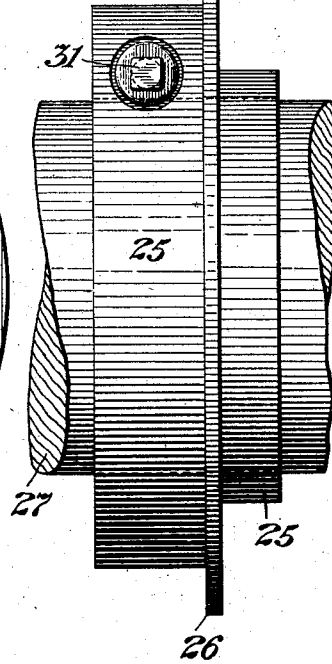


Fig. 9

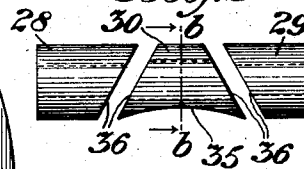
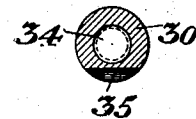


Fig. 10



Witnesses
 Chas. Clagett
 M. C. Stanton

Inventor
 John G. Jones
 By his Attorney
 Chas. M. Darr

UNITED STATES PATENT OFFICE.

JOHN G. JONES, OF ROCHESTER, NEW YORK, ASSIGNOR TO M. D. KNOWLTON COMPANY,
OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

FRICTIONAL LOCKING DEVICE.

974,156.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed July 19, 1906. Serial No. 326,839.

To all whom it may concern:

Be it known that I, JOHN G. JONES, citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Frictional Locking Devices, of which the following is a specification.

This invention relates to a locking device operating frictionally and adapted for fastening an adjustable or other movable part to hold it fixedly relative to another part at any position to which it may be adjusted; and the invention has for its object to provide a simple, inexpensive and reliable locking device of this character.

While a locking device embodying the invention may be adapted for varied uses, I have herein shown and described the same, as illustrative of certain specific and important uses to which it may be adapted, as applied to use for fastening the hand-adjusted reversible cutter-carrying bar of a paper-board scoring machine, and also for fastening the cutters to their carrying shafts in a paper or paper-board slitting machine.

In paper-board scoring machines the scoring cutters are adjustably supported in holders which are attached to a dovetail key projecting from one side of the cutter-bar, and this bar is journaled in a suitable frame in position to permit its supported cutters to cooperate with an opposing power-driven bed or feed roll to score or sever sheets of paper-board carried or fed therebetween. These cutter-bars are often made with two diametrically opposed dovetail keys each adapted to carry a series of cutters, and it is customary to turn the cutter-bar by hand to bring either of the two sets of cutters or scoring knives to operative position. To provide for easy and convenient reversal by hand of this cutter-bar its journals have a slight play or looseness in their bearings and this play, if not wholly taken up before the scoring operation is commenced, interferes with or prevents the cutters maintaining with accuracy their adjusted cutting position relative to the opposing bed-roll. In paper and paper-board slitting machines it is also desirable that the fastening of the opposed laterally adjustable cutters on their parallel shafts should be securely and accurately done in order to assure proper action of the cooperating pair or pairs of cutters.

By my present invention the locking in adjusted position of the scoring machine cutter-bar after its adjustment to bring a set of cutters to operative position, and the locking in adjusted position of the slitting machine cutters after desired adjustment of them on their shafts, is effected by means of a locking device herein shown as comprising a compressing means, preferably in the form of a bolt, carrying a plurality of movable sleeves having opposing cam or inclined end faces which cooperate when forced together under the action of the bolt to move one of said sleeves laterally to locking position; the locking device as a whole being connected with one of the parts between which locking connection is to be effected and the said laterally movable sleeve thereof being movable to and from a position of locking engagement with the other part to be locked, all as hereinafter described in detail.

Referring now to the accompanying drawings forming part of this specification, Figure 1 is a partly broken out front perspective view of portions of a paper-board scoring machine embodying one form of the invention. Fig. 2 is an enlarged broken out partial end view thereof. Fig. 3 is a like scale front detail view of a portion of the frame carrying a locking device. Fig. 4 is a side elevation of the two cooperating sleeves of the locking device shown in Figs. 1 and 2. Fig. 5 is a cross-section through the journal or shaft gripping sleeve, taken on the line *a-a* in Fig. 4. Fig. 6 is a front view of a portion of a slitting machine shaft and a cutter secured thereon by another form of the locking device. Fig. 7 is a partly broken out transverse sectional view of the parts shown in Fig. 6, with the cutter shaft gripped by one of the three cooperating cam or inclined faced sleeve portions of the locking device. Fig. 8 is a similar transverse sectional view showing the locking device inoperatively adjusted. Fig. 9 is a side elevation of the locking sleeves shown in Figs. 6, 7, 8; and Fig. 10 is a transverse section through the central shaft-gripping sleeve, taken on the line *b-b* in Fig. 9.

First referring more particularly to Figs. 1 to 5 of the drawings, the numeral 1 indicates a hole bored in the end frame post 2 of a paper-board scoring machine in direction transverse to the axis of the journal shaft 3 of the cutter-bar 4. This bore 1

opens into the frame bore 5 forming the journal bearing of the shaft 3, as more clearly shown in Fig. 2 of the drawings. From the inner end of the main bore 1 extends a smaller central counterbore 6 which is internally screw-threaded to receive the inner threaded end of a bolt 7 having a thrust-head 8 carrying a wrench receiving stud 9. Around the bolt 7 there is placed loosely an inner metal sleeve 10, the axial bore 11 of which has a larger diameter than that of the bolt to allow lateral play of this sleeve on the bolt. Said sleeve 10 has an inclined outer end 12, and also preferably has a convexed inner end 13 bearing against a shoulder 14 at the base of the frame bore 1, and adapted to rock on said shoulder. This sleeve 10 also preferably has a transverse arc-shaped concave recess 15 corresponding to the curvature of the cutter-bar shaft 3. On the bolt 7 at one side or forward of the sleeve 10 is loosely placed another sleeve 16 in which the bolt may turn and having an inclined forward end 17 preferably rounded or convexed a little to have all necessary rocking play upon the inclined end 12 of the sleeve 10 against which it bears in operation. Fig. 1 of the drawings shows that this frictional locking device is arranged at each end frame post 2 of the scoring machine. The cutter-bar 4 of this machine has diametrically opposite fixed projecting dovetail keys 18, 19 to either of which a series of holders 20 may be secured in well known manner. But one series of scoring cutters 21 are shown in holders 20 fixed to the key 18, but it is usual to secure such a series of holders and cutters to both keys 18, 19. These cutters score or sever paper-board carried under them by a bed or feed roll 22 driven by a pulley 23 on its shaft. The cutter-bar 4 has at each side a suitable hand-grasp 24 permitting the operator to turn the unlocked bar by hand in its journal bearings to bring either of its two series of cutters into operative relation with the feed roll 22. In Fig. 2 of the drawings, the cutter-bar shaft bearings 5 are shown somewhat larger than in practice to more clearly illustrate the operation, which is as follows: Before action on the paper-board of either series of cutters 21 carried by the bar 4, the bolts 7 in the end frame posts 2 are turned in or tightened by applying a key wrench to the bolt studs 9. This forces the outer sleeve 16 against the inner sleeve 10, the lateral play of which on the bolt allows the cooperating inclined faces 17, 12, of the two sleeves to force the concaved face 15 of the sleeve 10 very tightly against the shaft 3 of the cutter-bar 4, to securely lock the bar against movement in its bearings and thereby positively maintain its cutters in adjusted position relatively to the bed-roll and cause them to operate with that uniform cer-

tainty necessary to secure the best results in accurately scoring the paper-board to the required depth. The convexed inner ends 13, 17, of the sleeves 10, 16, and the enlarged bore 11 of the sleeve 10, permit said sleeve 10 to accurately and automatically adjust its gripping face 15 to the shaft 3 under any pressure of the bolt 7, to assure secure hold of the locking device upon the shaft.

In Figs. 6, 7, 8, of the drawings is shown another form of frictional locking device embodying the invention and herein shown as adapted to fasten the holder or hub 25 of the revoluble knife 26 to the shaft 27 of a paper or paper-board slitting machine having two such shafts carrying knives which cooperate in pairs to sever the paper or paper-board in well known manner. In this lock-such shafts carrying knives which cooperate in pairs to sever the paper or paper-board in a well known manner. In this locking device there are three sleeves 28, 29, 30, the one 28 being threaded to the inner end of the bolt 31, which also has a thrust-head 32, and a wrench-receiving stud 33. The outer sleeve 29 loosely fits the bolt 31 next its head, and the central sleeve 30 has a longitudinal bore 34 larger in diameter than the bolt to allow the sleeve necessary lateral play upon the bolt. One side of the sleeve 30 is transversely cut away to form an arc-shaped gripping surface 35. The meeting ends of the three sleeves 28, 29, 30, are inclined at 36, to mutually bear upon each other. The transverse bore 37 in the knife holder 25 receiving this locking device intersects the shaft bearing 38 of the holder, this bearing being somewhat enlarged in Figs. 7 and 8 of the drawings to promote clearer illustration.

It is obvious that when the bolt 31 is turned backward or loosened, the opposite end sleeves 28, 29 will separate and thus release the central sleeve 30 which in turn releases its gripping hold upon the shaft 27. This releases the knife holder 25, as shown in Fig. 8 of the drawings, and permits the knife to be shifted laterally to any required position along the shaft. To again fasten the holder and knife to the shaft 27, it only is necessary to turn the bolt 31 forward or inward to tighten it by a suitable wrench applied to the bolt stud 33. This draws the outer or end sleeves 28, 29 toward each other and by action of their inclined ends on the inclined ends of the central sleeve 30, the latter is forced inward and grips the shaft 27 by its concave face 35, to fasten the holder 25 and its knife securely to the shaft, as shown in Fig. 7 of the drawings, and so that said knife shall work most accurately relatively to another like knife secured to another parallel shaft of the machine.

Having thus set forth my invention in two slightly different forms thereof, it will be understood that the same may be further

and more materially modified, including the substitution of any suitable compressing means for acting on the sleeves other than the bolt shown, without departure from the spirit and scope of the invention.

I claim as my invention:

1. The combination with two parts between which locking connection is to be effected, of a locking device comprising a plurality of sleeves in contact at their ends one of which sleeves is adapted to be moved laterally under endwise pressure of an adjacent sleeve and forced against one of said parts, and the remainder against the other part to lock said parts from individual movement, the co-acting faces of said sleeves being inclined in the same direction, and a compression bolt passing freely through openings in said sleeves, the openings in said movable sleeve being larger than the bolt to permit lateral movement of said sleeve.

2. The combination with two parts between which locking connection is to be effected, one of said parts being provided with two openings in communication with each other, and the other part seated in one of said openings, of a locking device located

wholly within the other opening and comprising a compression bolt, and a plurality of sleeves mounted on said bolt and having co-acting inclined faces, one of said sleeves having an opening larger than said bolt and movable laterally under endwise compression of the bolt to lock said two parts together.

3. The combination with two parts between which locking connection is to be effected, of a locking device comprising a headed compression bolt threaded into one of said parts for endwise adjustment, and a plurality of sleeves loosely supported on said bolt between its head and the part in which it is threaded, said sleeves having their adjacent ends inclined in the same direction to cause one of the same under endwise compression to move laterally into position against one of said parts.

Signed at Rochester, in the county of Monroe and State of New York this 10th day of July A. D. 1906.

JOHN G. JONES.

Witnesses:

N. P. SANFORD,
WM. J. MALONEY.