T. C. DEXTER & G. H. HOLDT.

PAPER CUTTING MACHINE.

APPLICATION FILED AUG. 22, 1911.

1,036,975.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 1.

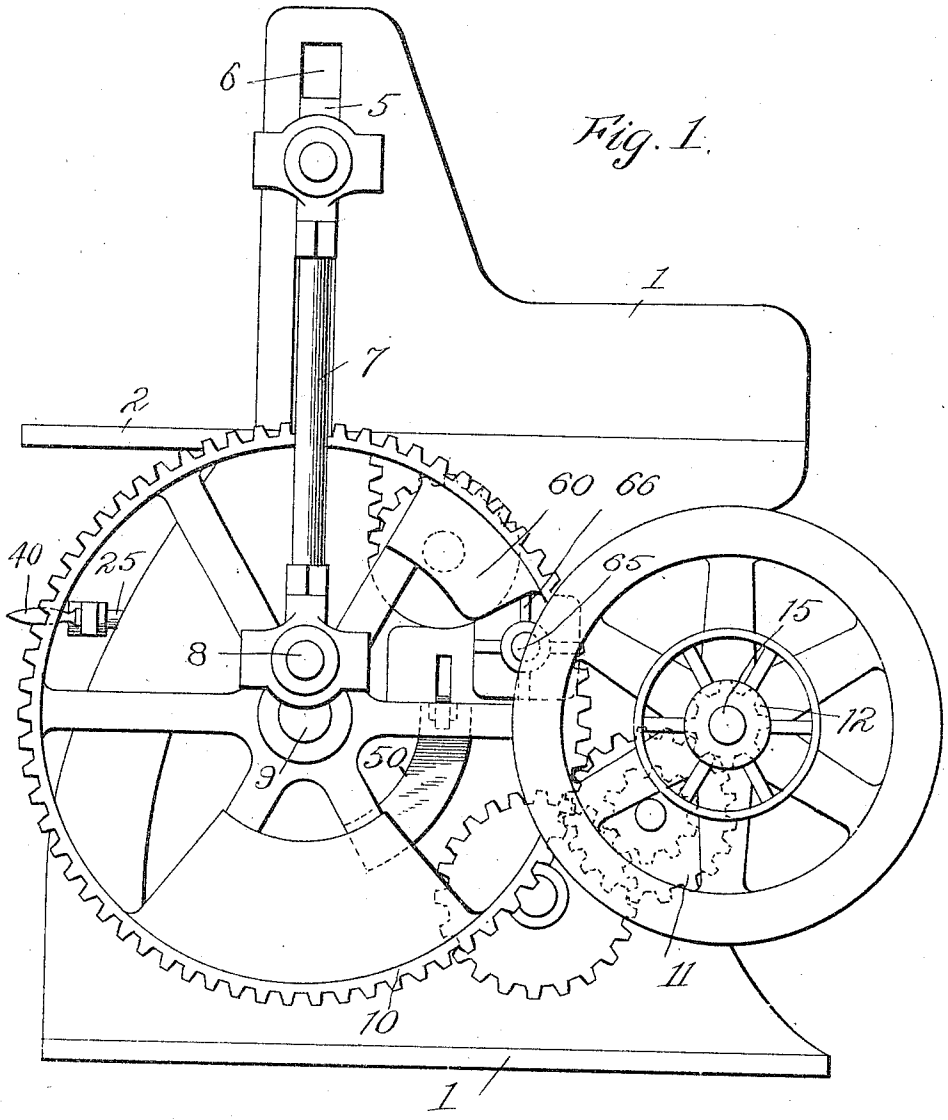


Fig. 1.

Witnesses:
Wm. A. Courtland.
Emanuel M. Fenster.

Talbot C. Dexter
George H. Holdt
Inventors.

By their Attorneys Knight Bros

T. C. DEXTER & G. H. HOLDT.

PAPER CUTTING MACHINE.

APPLICATION FILED AUG. 22, 1911.

1,036,975.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 2.

Fig. 2.

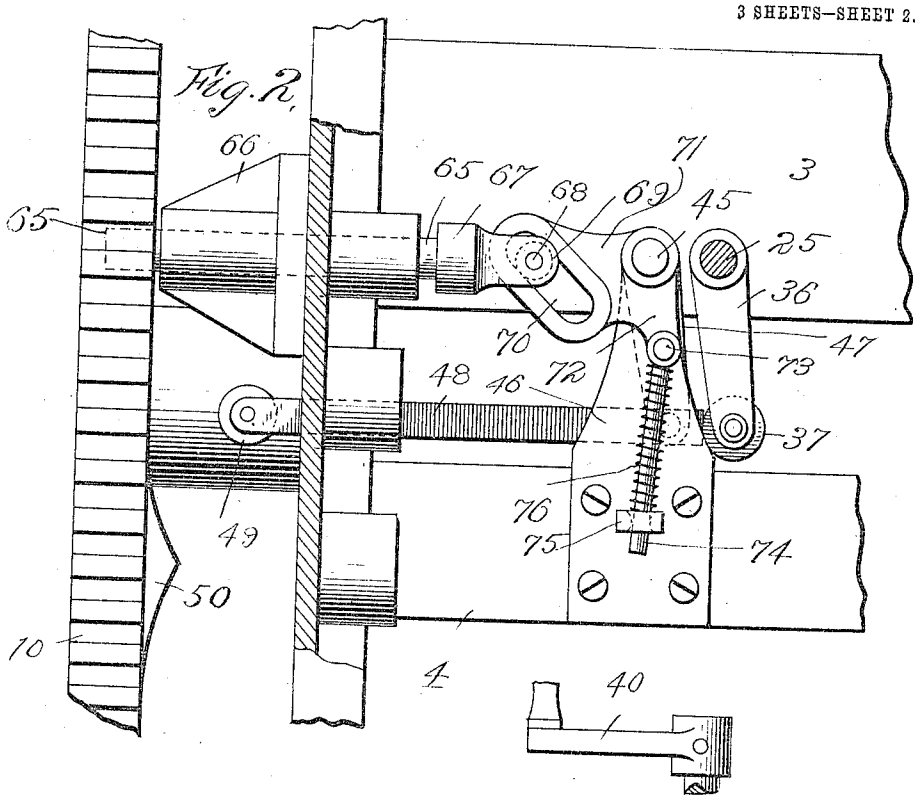
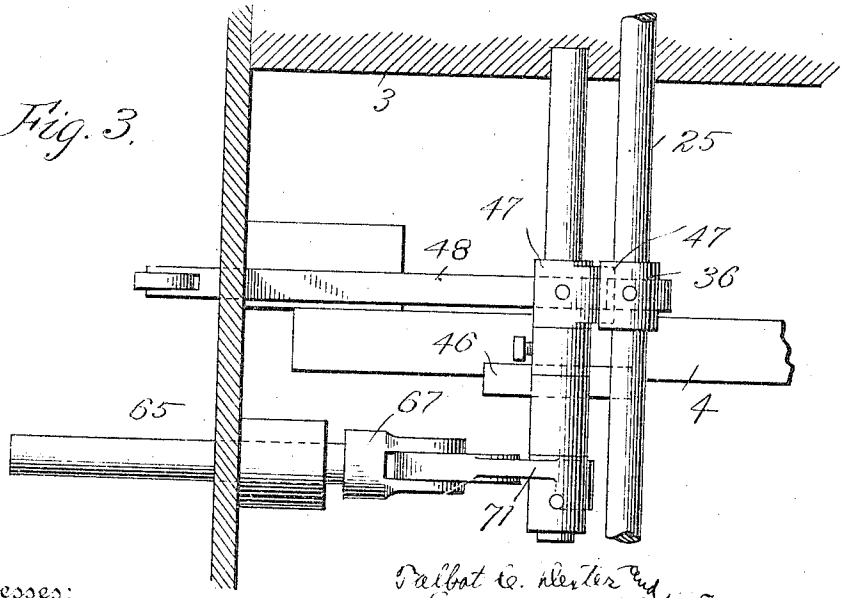


Fig. 3.



Witnesses:
Wm. A. Countland.
Emanuel M. Fenster.

Talbot & Dexter and
George H. Holdt Inventors,
By their Attorneys
Knight Bros.

T. C. DEXTER & G. H. HOLDT.

PAPER CUTTING MACHINE.

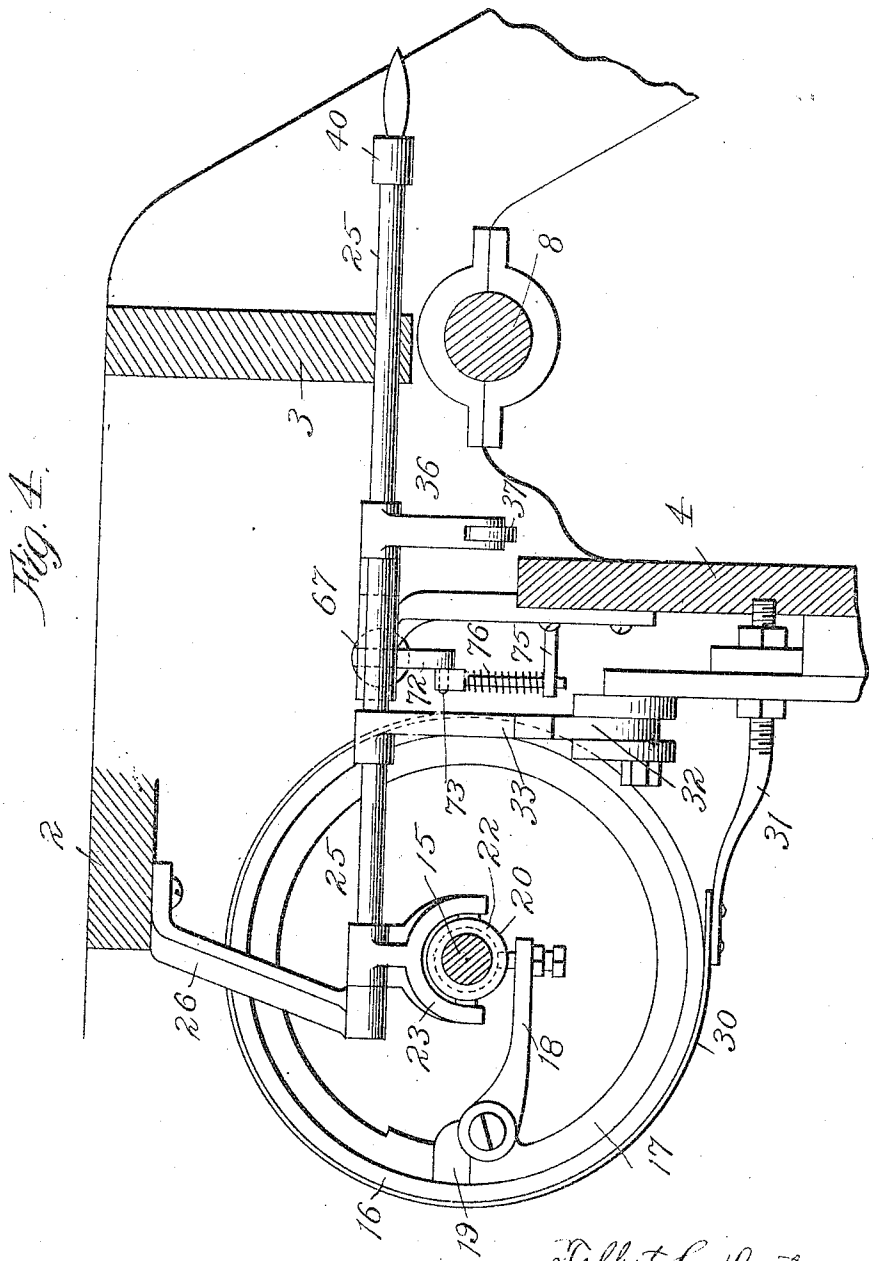
APPLICATION FILED AUG. 22, 1911.

1,036,975.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 3.

Fig. 4.



Witnesses:
Wm. A. Countland
Emanuel M. Fenster.

Talbot C. Dexter and
George H. Holdt
Inventors,

By their Attorneys Knight Bros.

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER AND GEORGE H. HOLDT, OF PEARL RIVER, NEW YORK, ASSIGNORS TO DEXTER FOLDER COMPANY, OF PEARL RIVER, NEW YORK, A CORPORATION OF NEW YORK.

PAPER-CUTTING MACHINE.

1,036,975. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed August 22, 1911. Serial No. 645,434.

To all whom it may concern:

Be it known that we, TALBOT C. DEXTER and GEORGE H. HOLDT, both citizens of the United States, and residents of Pearl River, Rockland county, State of New York, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a specification.

The present invention relates to improvements in safety locking devices for power-operated paper cutting machines of the type set forth in Patent No. 996,469 granted June 27th, 1911, to Irvin H. Dexter and George H. Holdt. In the operation of a paper cutting machine equipped with this Dexter and Holdt mechanism, some difficulty has been experienced when the machine is operated to bring the knife down upon a pile of paper by a series of short jerky strokes, as is necessary in performing certain kinds of work. The difficulty in this operation has been that each short movement of the clutch operating lever has actuated the safety bolt for a relatively short stroke so as to withdraw it only partially from the path of the shoulder of the knife operating gear. When this safety bolt is only partially withdrawn at the start of the cutting operation, there is danger of injury to the mechanism by shearing off the end of the bolt which projects slightly into the path of the stop shoulder. This defect in the Dexter and Holdt mechanism is due to the fact that the safety bolt is positively connected through links and levers with the clutch operating shaft so that a partial movement of said shaft for throwing the clutch in lightly serves only to partially withdraw the safety bolt. The present invention overcomes this difficulty in the mechanism of the Dexter and Holdt patent referred to, by disconnecting the safety bolt mechanism from the clutch operating mechanism and arranging it so that the slightest impulse given to the clutch operating shaft will result in the complete withdrawal of the safety bolt from the path of the stop shoulder upon the knife operating gear. The safety bolt is moved inwardly and outwardly in its bearings by means of a rocking lever pivotally connected with a spring actuated rod so as to form a toggle lock to hold the rocking lever in either of its shifted positions. The rocking lever is moved in one direction by the automatically operated throw-out bar, and in the other direction by a rock arm carried by the clutch operating shaft, and freely engaging (but not positively connected with) the end of the automatic throw-out bar or some other part connected with the bolt actuating rocking lever. With this improved mechanism, the first movement of the clutch operating shaft sufficient to engage the clutch will cause the safety bolt to be completely withdrawn from the path of the stop shoulder upon the knife operating gear, and being disconnected from the clutch operating shaft, it will remain in this withdrawn position until the knife operating gear makes a complete revolution, no matter how many times during the revolution the actuating clutch is thrown into or out of action. At the completion of a revolution of the knife operating gear, the safety bolt is automatically thrown into safety position in readiness to prevent an accidental repeat motion of the knife.

In order that our invention may be fully understood, we will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

In said drawings: Figure 1 is a side elevation of a paper cutting machine having our improvements applied thereto. Fig. 2 is an enlarged detail rear view, partly in section, illustrating the main parts of the invention. Fig. 3 is a detail sectional plan view of the same, and Fig. 4 is an enlarged detail vertical longitudinal sectional view of the same.

The present invention may be applied to any power driven paper cutting machine, but is illustrated as applied to the Dexter type of paper cutter. Such machines include a heavy framework having side frames such as 1, a bed or table such as 2, and the transverse beams or girders such as 3 and 4 for properly bracing the side frames.

5 indicates the reciprocating cross head which carries the cutting knife and is mounted to operate in the usual vertical guideways 6 of the side frames. The knife-carrying head 5 is connected in the usual manner by links 7 with cranks 8 secured to the opposite ends of the shaft 9 journaled in bearings in the side frames. The crank 8 at one end of shaft 9 is formed upon a large gear 10 which is rigidly secured to the shaft 9.

The large driving gear 10 meshes with and is driven by an intermediate gear 11 driven by a pinion 12 loosely journaled upon the main driving shaft 15. The driving pinion 12 has secured to it in any suitable manner a wheel or rim member 16 of a friction clutch, while driving shaft 15 has secured to it the internal fixed member of the friction clutch indicated by the numeral 17 in the form of a split ring.

Journaled at one end of the split ring 17 is an operating finger 18 formed with a heel 19 which rests between the two ends of the split ring, so that when the finger 18 is moved outwardly the ring will be expanded to frictionally engage the interior surface of the clutch rim or wheel 16. The clutch operating finger 18 is operated by the ordinary clutch spool 20 mounted to slide longitudinally upon the power shaft 15 and formed with an annular groove 22 engaged by the yoke 23 secured upon the end of the operating rock shaft 25. The rock shaft 25 is journaled in beam 3 and bracket arm 26 and extends from front to rear beneath the bed or table 2.

30 is the usual band brake encircling the clutch wheel or rim 16 and having one end secured to an adjusting bolt 31 which is fastened to the machine frame, and the other end attached to the usual spring actuated lever 32 pivoted in a suitable bracket upon the machine frame and controlled by a rock arm 33 keyed to the shaft 25. This part of the structure is more fully illustrated in the patent of Talbot C. Dexter, No. 807,730 dated December 19th, 1905.

The clutch operating rock shaft 25 has secured to its forward end a hand lever 40 by which it is actuated.

45 is a rock shaft journaled in bearings formed in the transverse beam 3 and the bracket 46 secured to transverse beam 4. The rock shaft 45 extends parallel with the clutch operating shaft 25. A rock arm 47 is keyed to and depends from the rock shaft 45, and pivotally connected with the lower end of rock arm 47 is a horizontally presented thrust bar 48 which extends through a suitable slot or opening in one of the side frames of the machine and carries in its outer end an anti-friction roller 49 which is normally presented in the path of a kicker cam 50 carried by the main driving gear 10. The clutch operating shaft 25 has secured to it a depending rock arm 36 mounted in the same transverse vertical plane of the machine as the rock arm 47 above referred to. Journaled in the lower end of rock arm 36 is an anti-friction roller 37 which is adapted to engage the inner end of thrust bar 48 so that the manual operation of shaft 25 for throwing in the clutch, will force thrust bar 48 outwardly to place anti-friction roller 49 in the path of the cam 50; and the reverse movement caused by engagement of cam 50 with roller 49 (once in each revolution of gear 10) will cause thrust bar 48 to engage rock arm 36 and rock shaft 25 for throwing the clutch out and applying the brake.

In the normal operation of a paper cutting machine in which the knife is operated and controlled by the mechanism which is described, it will be understood that the clutch will be thrown in for every operation of the knife and will be automatically thrown out at the completion of each operation. If by chance the clutch should fail to throw out at the proper time so that the knife operating gear would continue to rotate, the knife would repeat its action. To prevent this accidental repeating action of the knife, a heavy lug or shoulder, indicated at 60, is provided upon the knife operating gear 10 and a safety bolt 65 mounted in the heavily braced bearing bracket 66 rigidly secured to the outer face of one of the side frames 1. This safety bolt 65 projects entirely through the side frame 1 and carries at its inner end a yoke 67 supporting a transverse pin 68 upon which is journaled an anti-friction roller 69 operating in the inclined cam slot 70 formed in the rock arm or lever 71 rigidly secured to the rocking shaft 45 above referred to. The rock arm or lever 71 is provided with an angular projection 72 to which is pivotally connected at 73 a rod 74 extending downwardly through an enlarged opening in a guide plate 75 secured to the face of the bracket 46. An expansion spring 76 is confined upon the rod 74 between its head and the guide plate 75. It will be observed, particularly with reference to Fig. 2 of the drawings, that the angular extension 72 of lever 71 and spring actuated rod 76 constitute a toggle lock for holding the lever in either of its shifted positions, the pivot 73 being moved to one side or the other of a line drawn from the center of rock shaft 45 and center of guide plate 75 when the lever 71 is moved in either direction. The slotted lever 71 moves with the thrust bar 48 for withdrawing the bolt 65 when thrust bar 48 is projected and for projecting bolt 65 when thrust bar 48 is forced inwardly by cam 50.

From the above description, it will be understood that the operating mechanism for the safety bolt 65 is entirely disconnected from the clutch operating mechanism, but is at the same time dependent thereon for action. When the operator pulls up the hand lever 40 for throwing in the main clutch of the paper cutter, it will be observed that the rock arm 36 acting upon the end of thrust bar 48 will rock shaft 45 carrying the lever 71 and that the moment the pivot 73 passes the line connecting the centers of rock shaft 45 and guide plate 75, the spring 76 will ex-

pand and complete the movement of lever 71 to completely withdraw safety bolt 65 from the path of the shoulder 60 of gear wheel 10. A very slight movement of the clutch operating shaft 25 will cause this withdrawal of the safety bolt, so that the bolt will be surely withdrawn before the clutch can be thrown into action, and the operator can throw on and off the machine by the hand control as often as he wishes, without changing the withdrawn position of the safety bolt. As soon, however, as the cutter operating gear 10 has made a complete revolution, the cam 50, acting upon thrust bar 48, will force the rock shaft 45 in its opposite direction, rocking lever 71 downwardly to bring the bolt 65 in safety position. This movement of the parts again throws the toggle lock into action for holding the safety bolt projected as explained. It will of course be understood that the action of thrust bar 48 also rocks the clutch operating shaft 25 backwardly for throwing out the clutch and applying the brake.

What we claim is:

1. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be projected into engagement with a member of said knife operating mechanism, and means disconnected from, and operated by, said clutch operating mechanism for withdrawing said safety bolt.

2. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable manually controlled clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, automatic means for moving said safety bolt into engaged position, and means disconnected from, and operated by, said clutch operating mechanism for moving said safety bolt into inactive position.

3. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, means independent of said clutch operating mechanism for operating said safety bolt, and means actuated by said clutch operating mechanism for setting said bolt operating means into action.

4. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a spring device for operating said safety bolt, and means actuated by said clutch operating mechanism for throwing said spring device into action.

5. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating machanism, a spring actuated device for operating said safety bolt, automatic means for throwing said spring device into action for moving said safety bolt into engaged position, and means disconnected from, and operated by, said clutch operating mechanism for throwing said spring device into action for withdrawing said safety bolt.

6. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a toggle lock arranged to hold said safety bolt in either of its shifted positions, and means disconnected from said toggle lock and actuated by said clutch operating mechanism for operating said toggle lock to shift said safety bolt.

7. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a toggle lock arranged to hold said safety bolt in either of its shifted positions, automatic clutch throw-out mechanism adapted to actuate said toggle lock for shifting said safety bolt in one direction, and means actuated by said clutch operating mechanism for operating said toggle lock to shift said safety bolt in the other direction.

8. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be projected into engagement with a member of said knife operating mechanism, an actuating lever engaging said safety bolt, a spring actuated rod pivoted to said actuat-

ing lever and means actuated by the clutch operating mechanism for throwing said spring actuated rod into action.

9. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable manually operated clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, an actuating lever engaging said safety bolt, automatic means for operating said lever for moving said bolt in one direction, a spring actuated rod pivoted to said actuating lever for moving said bolt in the other direction and means actuated by the clutch operating mechanism for throwing said spring actuated rod into action.

10. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a rocking actuating lever formed with a cam slot engaging said safety bolt and an angular extension, a spring actuated rod pivotally connected with said angular extension and forming therewith a toggle lock, and means for actuating said toggle lock.

11. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and suitable manually operated clutch operating mechanism, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a rocking actuating lever formed with a cam slot engaging said safety bolt and an angular extension upon said lever, a spring actuated rod pivotally connected with said angular extension and forming therewith a toggle lock, an automatic clutch throw-out acting upon said lever for moving said bolt in one direction, and means disconnected from and acted upon by said clutch operating mechanism for breaking said toggle lock and moving said bolt in the other direction.

12. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and a clutch operating shaft, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a rock shaft, a rock arm depending from said rock shaft, a thrust bar pivotally connected with said rock arm, a throw-out cam carried by a member of the knife operating mechanism, a rocking lever mounted upon said rock shaft and operatively engaging said safety bolt, a spring actuated rod connected with said rocking lever, and a rock arm carried by said clutch operating shaft adapted to engage said thrust bar.

13. In a paper cutting machine, the combination with a knife, a power shaft, knife operating mechanism, a clutch connecting said power shaft with said knife operating mechanism, and a manually operated clutch operating shaft, of a safety bolt adapted to be moved into and out of engagement with a member of said knife operating mechanism, a rock shaft, a rock arm depending from said rock shaft, a thrust bar pivotally connected with said rock arm, a throw-out cam carried by a member of the knife operating mechanism, a rocking lever mounted upon said rock shaft and operatively engaging said safety bolt, a toggle lock connected with said rocking lever, and a rock arm carried by said clutch operating shaft adapted to engage said thrust bar.

TALBOT C. DEXTER.
GEORGE H. HOLDT.

Witnesses:
EUGENE KETCHUM,
CORDES LUCAS.