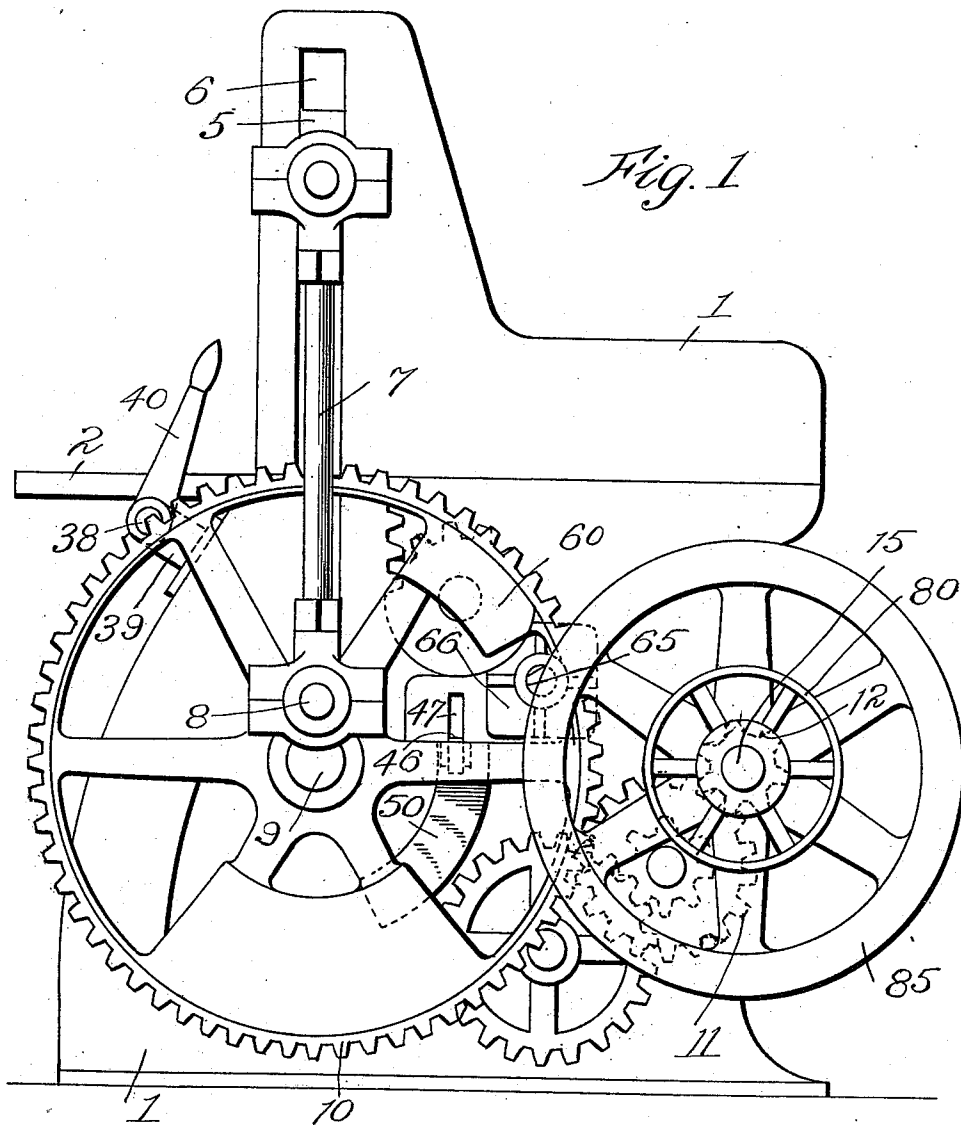


I. H. DEXTER & G. H. HOLDT.
PAPER CUTTING MACHINE.
APPLICATION FILED SEPT. 9, 1910.

996,469.

Patented June 27, 1911.

3 SHEETS—SHEET 1.



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Marion Clifford

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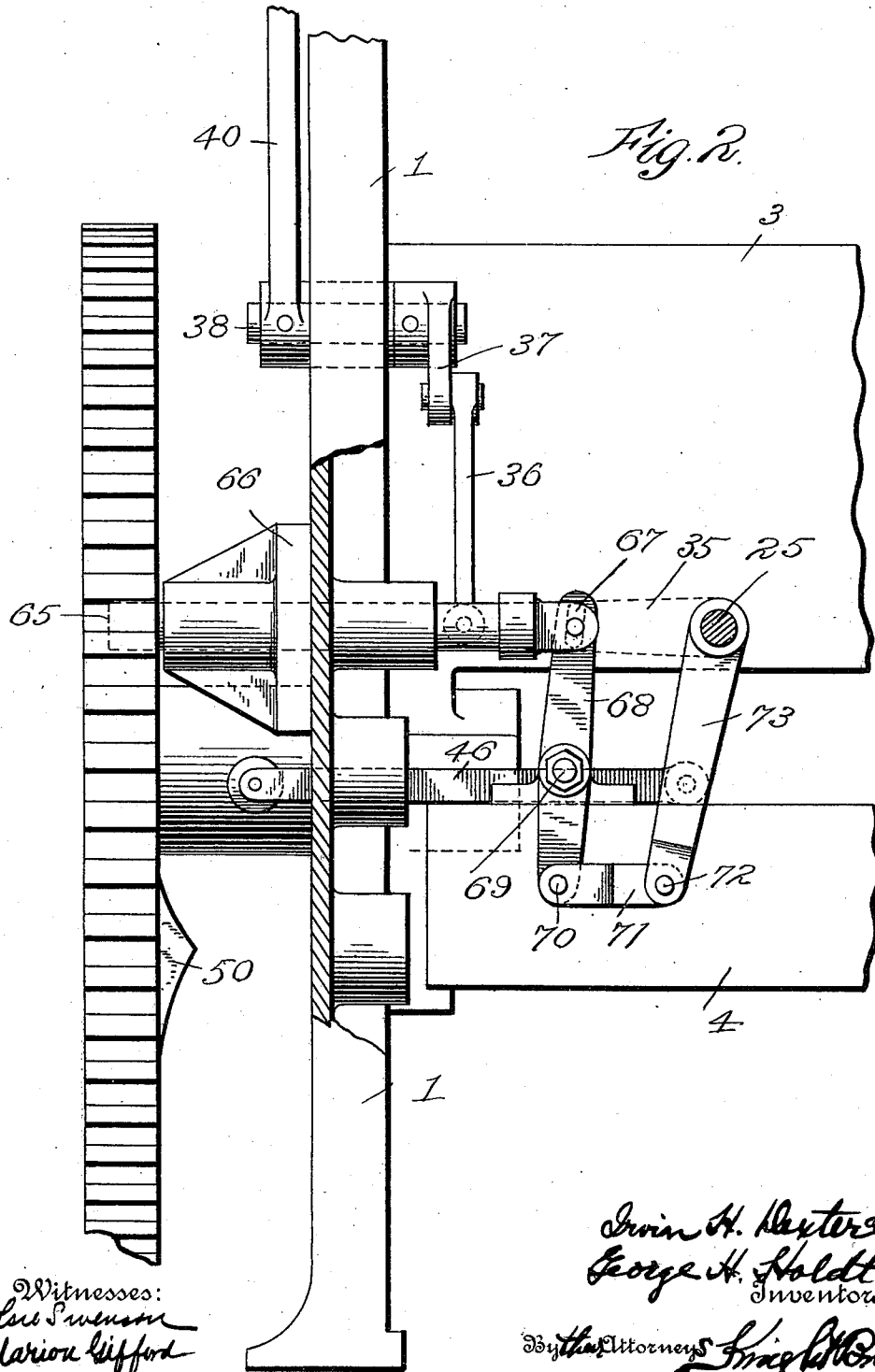
By their Attorneys
F. H. H. H.

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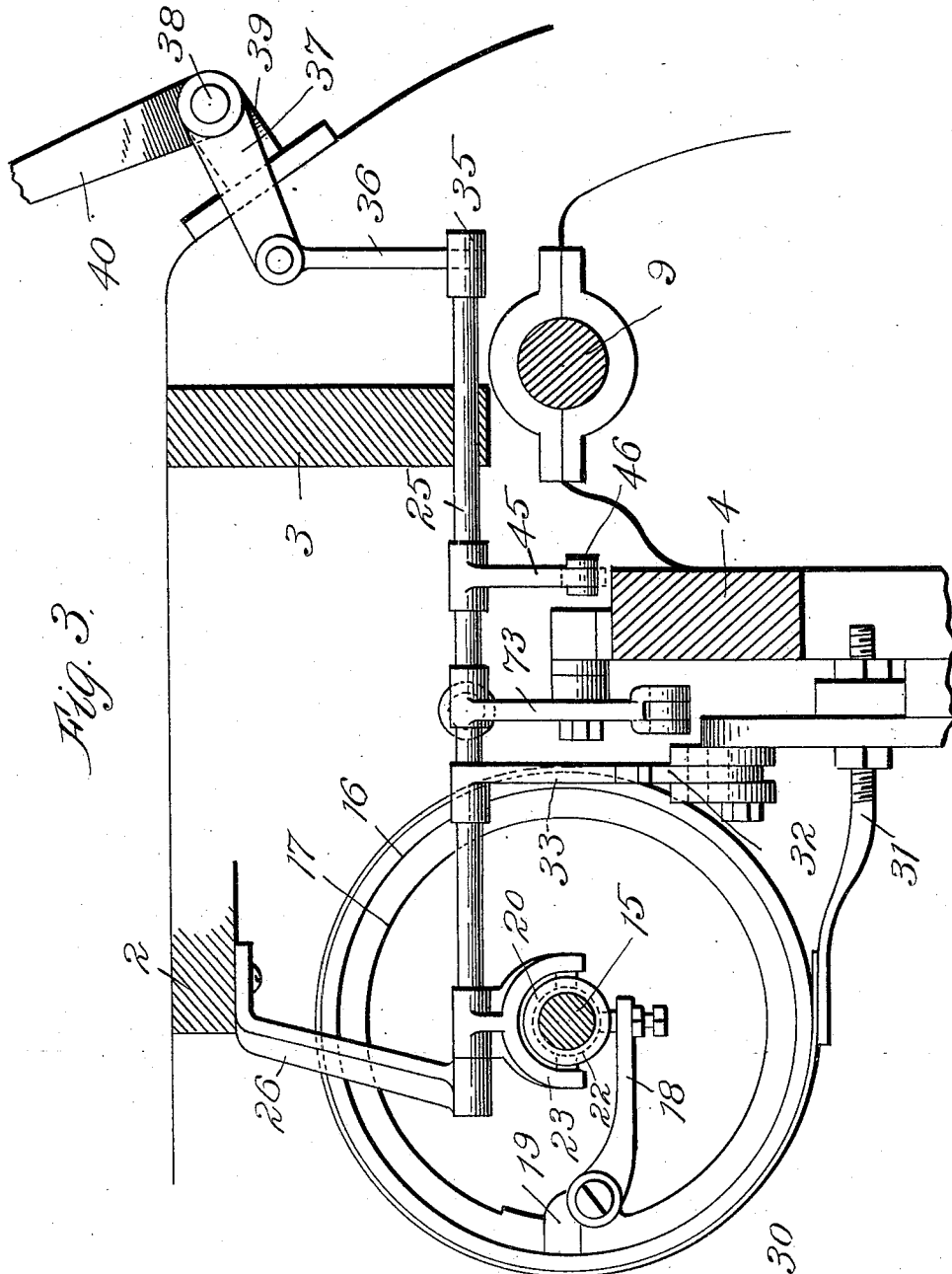


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APPLICATION FILED SEPT. 8, 1910.

996,469.

Patented June 27, 1911.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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

PAPER-CUTTING MACHINE.

996,469.

Specification of Letters Patent. Patented June 27, 1911.

Application filed September 9, 1910. Serial No. 581,180.

To all whom it may concern:

Be it known that we, IRVIN H. DEXTER and GEORGE H. HOLDT, 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.

In the operation of power driven paper cutting machines, as heretofore constructed, many painful accidents have resulted from the failure of the automatic throw-out of the operating clutch by reason of which failure the stroke of the cutting knife repeats. This inaccuracy is a most dangerous feature of such machines since the operator, who becomes very skilful in rapidly arranging bunches of sheets for trimming, is very apt to have his hand beneath the knife when it descends without warning. Many suggestions have been made for correcting this defect in paper cutting machinery, but partly because of their complicated nature and partly because of their liability to get out of order, such proposed safety devices have not been entirely satisfactory.

The object of the present invention is to provide a safety lock for paper cutting machines which will be absolutely reliable in preventing the accidental cutting movement of the knife, whether from the failure of the clutch throw-out mechanism at the completion of a cutting operation, or from any other cause. In accomplishing this object, we provide the machine frame with a heavily braced bearing carrying a stop bolt which is adapted to be automatically projected into the path of a part of one of the operating members of the machine. This locking bolt is preferably designed to engage a strong shoulder or face upon the main driving gear of the cutting knife, so that when the bolt is moved into active position, it will instantly stop the rotation of said driving gear and arrest the descent of the knife. This locking bolt must be automatically actuated by some mechanism which is thrown into operation at the completion of every cutting stroke of the knife. It is customary with power driven cutting machines to operate the knife from a friction clutch mechanism suitably geared to the main gear of the knife and this friction clutch is controlled by a hand lever for starting the cutting operation, and is automatically thrown

out of operation by some clutch tripping device. Our improved safety lock is preferably connected up with this clutch tripping device so that every time the tripping device is actuated for throwing out the clutch, the locking bolt will be projected into active position for insuring the arrest of the knife operating gear. With such an arrangement, the knife will be arrested whether or not the clutch is properly thrown out.

For the purpose of illustrating our invention, we have shown it applied to a paper cutting machine of the type covered by the patents of Talbot C. Dexter, No. 807,730 dated December 19, 1905, and No. 937,514 dated October 19, 1909.

In the accompanying 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 our invention, and Fig. 3 is an enlarged vertical longitudinal sectional view of the same.

The type of power driven paper cutting machine which is illustrated in the above named Dexter patents, includes 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 guide-ways 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

5 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 a 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.

At the forward end of the rock shaft 25 is mounted a long rock arm 35 connected by a link 36 with a rock arm 37 keyed to a short rock shaft 38 which is journaled in the bracket bearing 39 secured to a front portion of one of the side frames 1. A hand lever 40 is keyed to the short rock shaft 38 and by operating said hand lever the shaft 25 can be rocked for throwing in the clutch and releasing the band brake.

The operation of throwing in the clutch for starting the machine is accomplished manually, but it is necessary to provide automatic means for arresting the cutting operation at the completion of a stroke. To accomplish this, the rock shaft 25 is provided with a depending rock arm 45, to the lower end of which is pivoted a horizontally presented thrust bar 46 which extends through a suitable slot or opening 47 in the side frame of the machine and carries in its outer end an anti-friction roller which is normally presented in the path of a kicker cam 50, carried by the main driving gear 10, so that once in each revolution of the gear 10, the cam 50 will force the thrust bar 46 inwardly to rock the shaft 25 for throwing out the clutch and applying the brake.

The mechanism so far as described is substantially the same as covered by the Dexter Patent No. 807,730 above referred to, and it will be better understood by referring to said patent. This mechanism is illustrated and described as showing the preferred application of the present improvements.

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, we have provided a heavy lug or shoulder indicated at 60 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 has a pin and slot connection 67 at its inner end with the upper end of a lever 68 journaled at 69 upon the frame beam 4. The lower end of this lever 68 is pivotally connected at 70 with a link 71 pivoted at 72 to the lower end of a rock arm 73 keyed to and projecting down from the rock shaft 25 above referred to.

By this arrangement it will be observed that when the thrust bar 46 is projected outwardly into the path of the kicker cam 50, the safety bolt 65 is withdrawn into its bearing socket out of the path of the lug or shoulder 60. When the kicker cam operates the thrust bar 46 for releasing the clutch and applying the brake, the induced movement of the shaft 25 immediately projects the safety bolt 65 into the path of the lug or shoulder 60 of the gear wheel 10. This alternative movement between the thrust bar 46 and safety bolt 65 takes place every time the rock shaft 25 is rocked, one position being caused by the manual operation of the hand lever 40, and the other position being caused by the automatic operation of the thrust bar 46 by the kicker cam 50. Normally the operation of the thrust bar throws out the main clutch and applies the brake to the loose clutch member, but if for any reason the clutch is not immediately released, the safety bolt 65 is engaged by the shoulder 60 and instantly arrests the rotation of the gear 10 and prevents the descent of the knife.

A driving belt pulley 80 and a fly wheel 85 are securely keyed to the end of the driving shaft 15 as in the usual construction of Dexter paper cutting machines.

It will be understood from the above description that in the normal operation of a paper cutting machine equipped with our improved safety lock, the automatic release of the driving clutch and application of the brake will arrest the operation of the cutter. In this normal operation the shoulder 60 upon gear 10 does not contact with the safety lock bolt 65 although said bolt is in position for operation every time the cutter is thrown out of action so as to be ready to prevent a repeat movement of the knife in the event of some accidental disarrangement of the clutch by which the clutch fails to release its grip upon the driving train of the knife. When the safety bolt 65 arrests the knife movement, as explained, it will be understood that it engages the rela-

tively slow moving knife operating gear 10. The shock of instantly stopping the gear 10 is absorbed in the gearing between said gear 10 and the power shaft, the friction driving clutch yielding sufficiently to prevent the breakage of any of the parts.

What we claim is:

1. In a paper cutting machine, the combination with a knife, a train of gears for operating said knife, a stop shoulder upon one of said gears, a power shaft, a clutch connecting said power shaft with said train of gears, suitable clutch operating mechanism, a safety bolt adapted to be projected into the path of said stop shoulder, and means connecting said safety bolt with said clutch operating mechanism.

2. In a paper cutting machine, the combination with a knife, a knife operating gear formed with a stop shoulder, a driving shaft, gearing between said shaft and said knife operating gear including a friction clutch, a rock shaft, a clutch operating arm upon said rock shaft, a manually operated lever suitably connected with said rock shaft, a thrust

bar connected with said rock shaft, a cam mounted upon said knife operating gear and adapted to engage and operate said thrust bar, a safety bolt adapted to be projected into the path of said stop shoulder, a braced bearing for said safety bolt and means connecting said safety bolt with said rock shaft.

3. In a paper cutting machine, the combination with a knife, a knife operating gear formed with a stop shoulder, a driving shaft, gearing between said shaft and said knife operating gear including a friction clutch, a rock shaft operatively connected with said clutch, means for operating said rock shaft for throwing said clutch into and out of operation, a safety bolt adapted to be projected into the path of said stop shoulder, and means connecting said safety bolt with said rock shaft.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."