

No. 835,190.

PATENTED NOV. 6, 1906.

B. KARFIOL.  
MACHINERY FOR CUTTING OR DIVIDING PAPER.

APPLICATION FILED JULY 17, 1906.

2 SHEETS—SHEET 1.

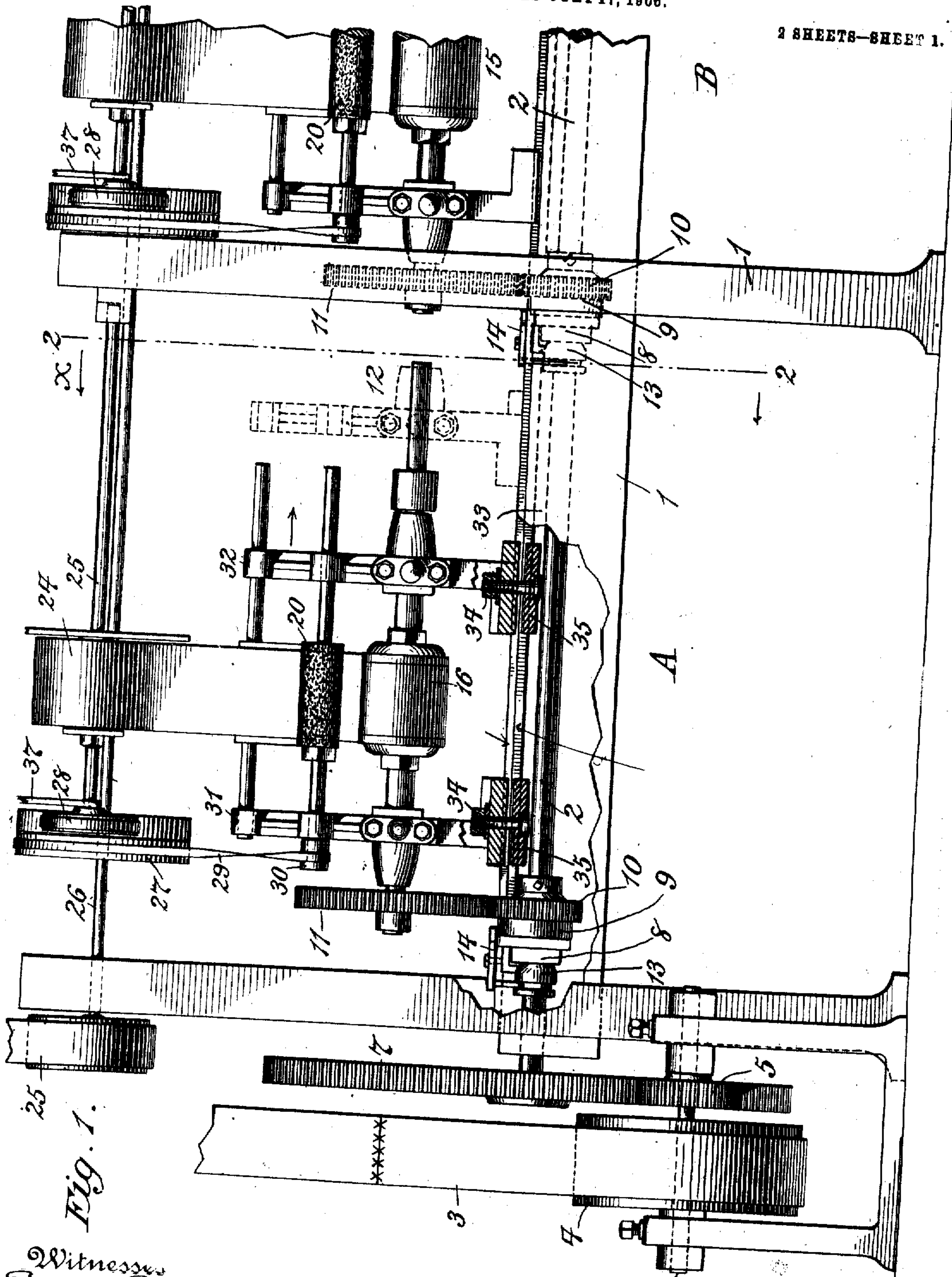


Fig. 1.

Witnesses  
Edward R. Roubert.  
William J. Hoffman.

Inventor  
B. Karfiol  
By his Attorneys  
Stuart & Stuart

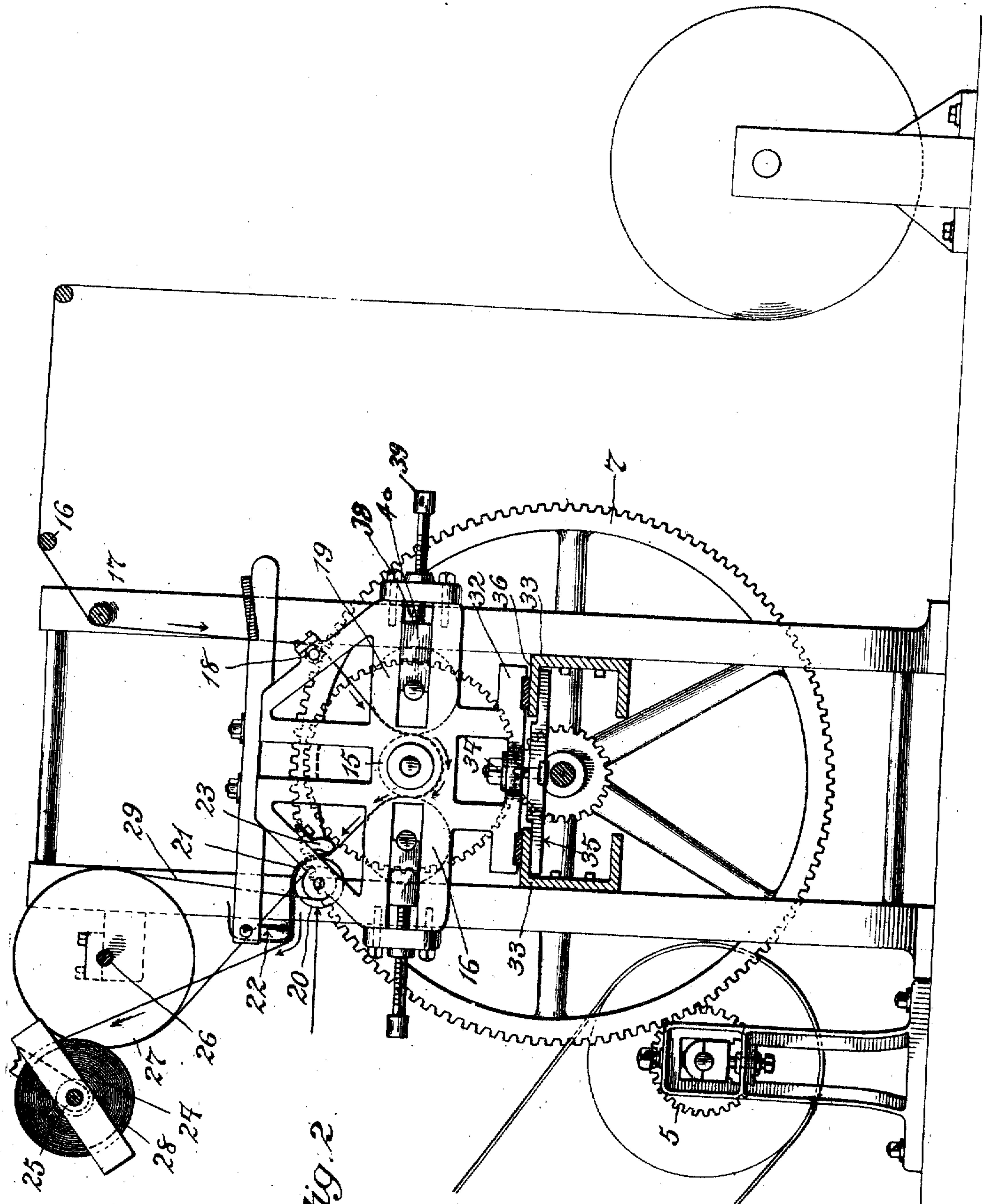
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Witnesses  
Edward Dowland,  
William Jefferson

Inventor  
Benjamin Karfiol  
By his Attorneys Stuart & Stuart



# UNITED STATES PATENT OFFICE.

BENZION KARFIOL, OF NEW YORK, N. Y.

## MACHINERY FOR CUTTING OR DIVIDING PAPER.

No. 835,190.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed July 17, 1906. Serial No. 326,558.

*To all whom it may concern:*

Be it known that I, BENZION KARFIOL, a citizen of the United States of America, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machinery for Cutting or Dividing Paper, of which the following is a specification.

My present invention relates to improvements in perforating or dividing machines, and has particular reference to machines used in the manufacture of lace-paper, although not confined to any such specific class of machine.

The object of my present invention is twofold in its general character, and is, in the first place, to increase the utility and efficiency of a single machine or paper-perforating element by so designing the same as to permit of a simple and ready adjustment and interchangeability of the parts thereof whereby varying widths of paper may be impressed with any desired design or demarcation.

In addition to increasing the utility of the single machine or cutting element my invention has for a second object to so design the single machine that groups of the same may be mounted collectively and driven or otherwise operated from single driving and operating means, and to provide such a collective mounting and operation of the same.

The type of machine heretofore in use in the art has in general been of bulky and complicated structure, whereby substitution of new dies and parts for old and worn ones or the interchanging of dies of one size or type for those of another have not been readily accomplished, as in the present invention. Furthermore, the structure of machine heretofore in use has been such as to make it infeasible or impracticable to operate a number of cutting or impressing elements collectively or in groups, while still providing for ready adjustment and disassembling of the elements thereof.

The objects of my invention I attain in the structure now to be described, reference being had to accompanying drawings, in which—

Figure 1 is a view in elevation, partly sectioned, showing one of my machines in its entirety and another in part and showing my manner of mounting and operating the two. Fig. 2 is a view in end elevation taken on the

line 2 2 of Fig. 1 and looking in the direction of the arrow X.

Referring to the drawings, a single machine or paper-cutting element is shown at A and another at B. These two are mounted on a single standard or frame-piece 1, through which extends a power-shaft 2, common to both and driven from the belt 3 by means of a pulley 4, a pinion 5 on the shaft with pulley 4 and a gear 7 on the power-shaft 2.

On the shaft 2, as shown in Fig. 1 to the left of A and to the left of B, are clutches 8 of any suitable type. Sleeves 9 form part of a member of the clutch loosely mounted upon the shaft 2 and in turn carry the pinions 10, which mesh with gears 11 on counter-shafts 12. Normally the clutch members 9 ride idly upon the shaft 2, but upon sliding the clutch member 13, as by operating any suitable lever 14, the clutch members engage and rotate together with shaft 2, whereby gears 10 and 11 are rotated and shafts 12 rotate with shaft 2.

Shaft 12 I use here as the driving-shaft of a steel die 15, between which and an opposing die or roller 16 the paper in the machine shown is embossed and indented. In this machine the paper is operated upon as described in my copending application, Serial No. 324,834, filed July 5, 1906. The paper is fed from a supply over idlers 16, 17, and 18, and thence down between the die 15 and a roller 19, which latter maintains the paper in close contact with the die 15. In this machine the paper is not actually cut by the roller or die 15, but is merely indented thereby and passes therefrom over a revolving abrading-roller 20. The indentations made in the paper by the die 15 are removed from the surface of the paper by the roll 20 and perforations thereby made to appear in lieu thereof. The paper is shown held in contact with the cutting or dividing roller 20 by means of a resilient strip or spring 21, carried on the supports 22 and 23, which latter are preferably adjustable to vary the pressure of the paper on the roller. From the cutting-roller 20 the paper is drawn to a take-up roll 24.

The elements just described are found in both machines A and B. The take-up rolls 24 of the machines are mounted on individual shafts 25, driven from a single drive-shaft 26 by means of pulley 27 on shaft 26 and pulley 28 on shaft 25, pulleys 27 and 28 being ar-



ranged to have frictional engagement with each other when the rolls 24 are in operation. Abrading-roll 20 is driven from shaft 26 by pulley 27, belt 29, and pulley 30.

5 The die 15 and the rolls 16 and 19 are carried on shafts having bearings at either end in standards 31 and 32. In order that the rolls 15 and 16 may be interchanged for the purpose of impressing the paper with a variety of designs or for the purpose of impressing varying widths of paper, one or both of the standards 31 and 32 are adjustably mounted to be moved on the main standard or frame 1 into and out of engaging position with the roll-shafts.

15 Referring to Fig. 2, there is shown in cross-section on either side of the frame 1 an angle-iron 33, secured to the frame and serving as a guide and support for the standards 31 and 32. Connected to the standards 31 and 32, as by bolts 34, are bearing or locking plates 35. These plates, it will be observed, fit under the upper extension 36 of the angle-irons 33. When the bolts 34, and consequently the plates 35, are loose, the standards 31 and 32 may be moved along the frame; but when the bolts 34 are tightened the plates 35 are brought into unyielding engagement with the extensions 36 of the irons 33, whereby the standards are held rigidly in place.

30 The rolls 16 and 19, between which and the roll 15 the paper passes, are adjustably mounted in slots 38 in the standards 31 and 32. By means of adjusting-screws 39, engaging the bearing-blocks 40 in the slots 38, the pressure of the rolls 16 and 19 on the roll 15 may be regulated at will. Thus in the present structure the roll-bearing adjustments are all directly mounted in the standards 31 and 32 and are carried thereby when the latter are moved on the ways 33. Before moving the bearing-standards the roll-bearings 16 and 19 may be loosened by turning the screws 39. By having the adjustments 39 carried on the standards 31 and 32 I avoid the usual more elaborate arrangement for adjusting the rolls, and besides considerably simplifying the operation of the device I make practicable the accomplishment of the various objects of this invention.

50 The operation of my invention is as follows: Provided certain only of the individual machines or paper-cutting elements are intended to be used, only such of the clutches as control the machines to be used are thrown to bring the proper machines into connection with the power-shaft 2. The power is then transmitted to the driving-shaft of the paper-impressing die 15 from belt 3 through the pulley 4, shaft 6, pinion 5, gear 7, shaft 2, clutch elements 13 and 9, and gears 10 and 11. The revolution of the die-roll 15 causes the rolls 16 and 19 to revolve and the paper to be drawn thereto from its supply. The paper is then drawn from the impression-dies over

the abrading-roller 20, whereby the indentations received at the die are cut off and the paper perforated. The abrading-roller, as stated, is rotated from the shaft 26 by pulley 27, mounted thereon, belt 29, and pulley 30 on shaft with the abrading-roll. From the abrading-roll the paper is drawn to the take-up roll. This roll is mounted upon a shaft 25, which carries at one end thereof a frictional driving-pulley 28. The shaft 25 is journaled in a frame 37, pivoted to bring the pulleys 27 and 28 into and out of engagement when that particular cutting element is to be operated, and the pulley 28 bearing against the pulley 27 receives by frictional engagement therewith the power to rotate the take-up roll.

When it is desired to substitute new dies and rolls or to assemble or dismantle the machine, the screws 39 are loosened and the bolt 34 is unscrewed to loosen the standard 32, whereupon the latter, together with its bearing-plate 35, is slid along the frame 1 to a position such as shown in the dotted lines in Fig. 1. The shafts of the dies and rolls may then be readily withdrawn from their bearing in the standard 31 and lifted out between the standards 31 and 32. New dies and rolls may then be substituted by inserting their bearing-shafts in standard 31 and then moving in and locking the standard 32. The screws 39 are then turned until the proper pressure at the rolls is attained and the device is ready for operation.

I claim—

1. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a guideway on said standard, bearing plates or standards one of which is adjustably mounted to be moved on said guideway, and a paper-impressing roll having a bearing-shaft extending lengthwise of said guideway, said shaft having bearing in said bearing-standards when the latter are in one position on said guideway.

2. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a guideway on said standard, bearing plates or standards one of which is adjustably mounted to be moved on said guideway, means for locking said adjustable bearing-standards in a suitable position on said guideway, and a paper-impressing roll having bearing in said bearing-standards when the latter are in one position on said guideway.

3. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a pair of parallel guideways on said standard, bearing plates or standards one of which is adjustably mounted to be moved on said guideways, a locking-piece for said bearing-standards bridging said guideways and carried by one of said bearing-standards, means for tightening said locking-piece to said guideways to lock said bearing-standards in a



suitable position on said guideways, and a paper-impressing roll having bearing in said bearing-standards when the latter are in one position on said guideways.

5 4. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a pair of parallel guideways on said standard, bearing plates or standards one of which is adjustably mounted to be moved on said  
10 guideways, a locking-piece for said bearing-standards carried by said standards below the guideways and bridging the latter, means for tightening said locking-piece to said guideways to lock said bearing-standards in a  
15 suitable position on said guideways and a paper-impressing roll having bearing on said bearing-standards when the latter are in one position on said guideways.

20 5. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a plurality of cutting elements placed along said standard, a power-shaft carried by said standard, separate driving means for said cutting elements, a guideway on said standard, ad-  
25 justable bearing-plates mounted on said guideway, paper-impressing rolls for said cutting elements having bearing in said bearing-plates when the latter are in certain adjusted positions on said guideway, and a means for  
30 connecting and disconnecting said separate driving means to and from said power-shaft regardless of the position of said bearing-plates on said guideway.

35 6. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a plurality of cutting elements spaced along said standard, a guideway extending along the line of said cutting elements, a paper-impressing roll on each of said cutting ele-  
40 ments, and bearing-plates for said rolls, one bearing-plate of the roll of each cutting element being adjustable on said guideway.

45 7. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a plurality of cutting elements spaced along said standard, a guideway extending along the line of said cutting elements, a paper-impressing roll on each of said cutting elements, bearing-plates for said rolls, one bearing-plate of  
50 the roll of each cutting element being adjustable on said guideway, a take-up roll for each of said cutting elements, and a driving-shaft common to all of said take-up rolls.

55 8. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a power-shaft carried by said standard, a group of paper-cutting elements spaced along

said standard, separate driving means for said cutting elements and clutches for connecting and disconnecting said separate  
60 driving means to and from said power-shaft, a take-up roll for each of said cutting elements a driving-shaft common to all of said take-up rolls, and means for connecting any or all of said take-up rolls to said driving-shaft.

65 9. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a power-shaft carried by said standard, a group of paper-cutting elements placed along said standard, separate driving means for  
70 said cutting elements and clutches for connecting and disconnecting said separate driving means to and from said power-shaft, a take-up roll for each of said cutting elements and a driving-shaft common to a plu-  
75 rality of said take-up rolls having a pivotal mounting such that any or all of said rolls may be thrown into and out of connection with said driving-shaft.

80 10. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a guideway on the same, bearing plates or standards, one of which is adjustably mounted on said guideway, a paper-impressing roll having a bearing in said plates when the lat-  
85 ter are in certain adjusted positions, a roll coacting with said first-named roll, said last-named roll having adjustable bearings in slots or ways in said bearing-plates, whereby the latter roll may be moved to and from the im-  
90 pressing-roll to regulate the pressure on the paper between the rolls.

95 11. Apparatus for cutting or perforating paper, comprising a standard or bed-piece, a guideway on the same, bearing plates or standards, one of which is adjustably mounted on said guideway, a paper-impressing roll having a central bearing in said plates when the latter are in certain adjusted positions, rolls coacting with said first-named roll and  
100 disposed on opposite sides thereof, said last-named rolls having adjustable bearings in slots or ways in said bearing-plates whereby the latter rolls may be moved to and from the central bearing of said impressing-roll to reg-  
105 ulate the pressure on the paper between the rolls.

Signed by me in the city, county, and State of New York this 27th day of June, 1906.

BENZION KARFIOL.

Witnesses:

PAUL BONYNGE,  
WM. L. MORRIS.