No. 680,655. Patented Aug. 13, 1901.

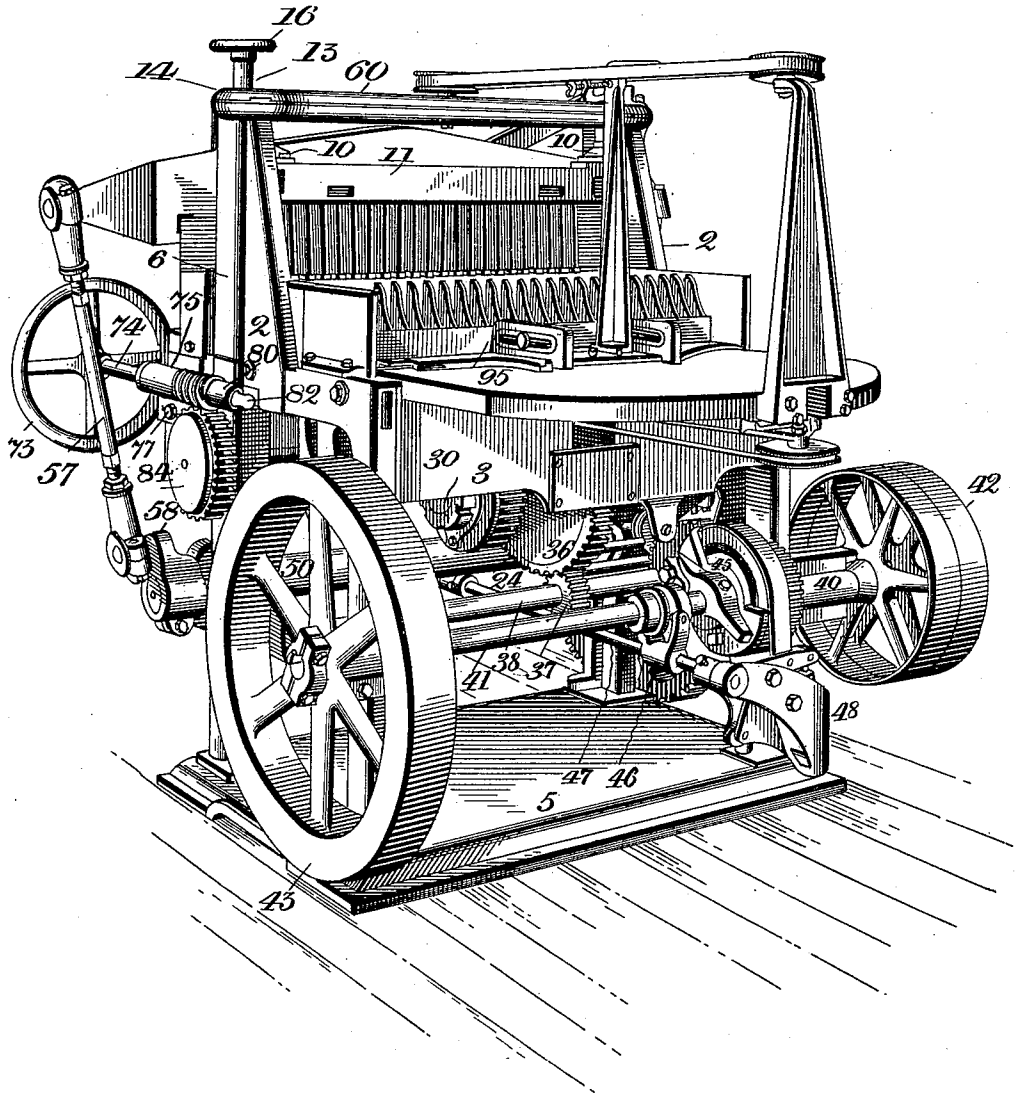
N. GRAY, JR.

PAPER CUTTING MACHINE.

(Application filed May 18, 1900.)

(No Model.) 5 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

L. C. Hills

E. J. Redmond

INVENTOR

Neil Gray Jr.

BY W. A. Redmond Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,655. Patented Aug. 13, 1901.

N. GRAY, JR.

PAPER CUTTING MACHINE.

(Application filed May 18, 1900.)

(No Model.) 5 Sheets—Sheet 2.

Fig. 1.a

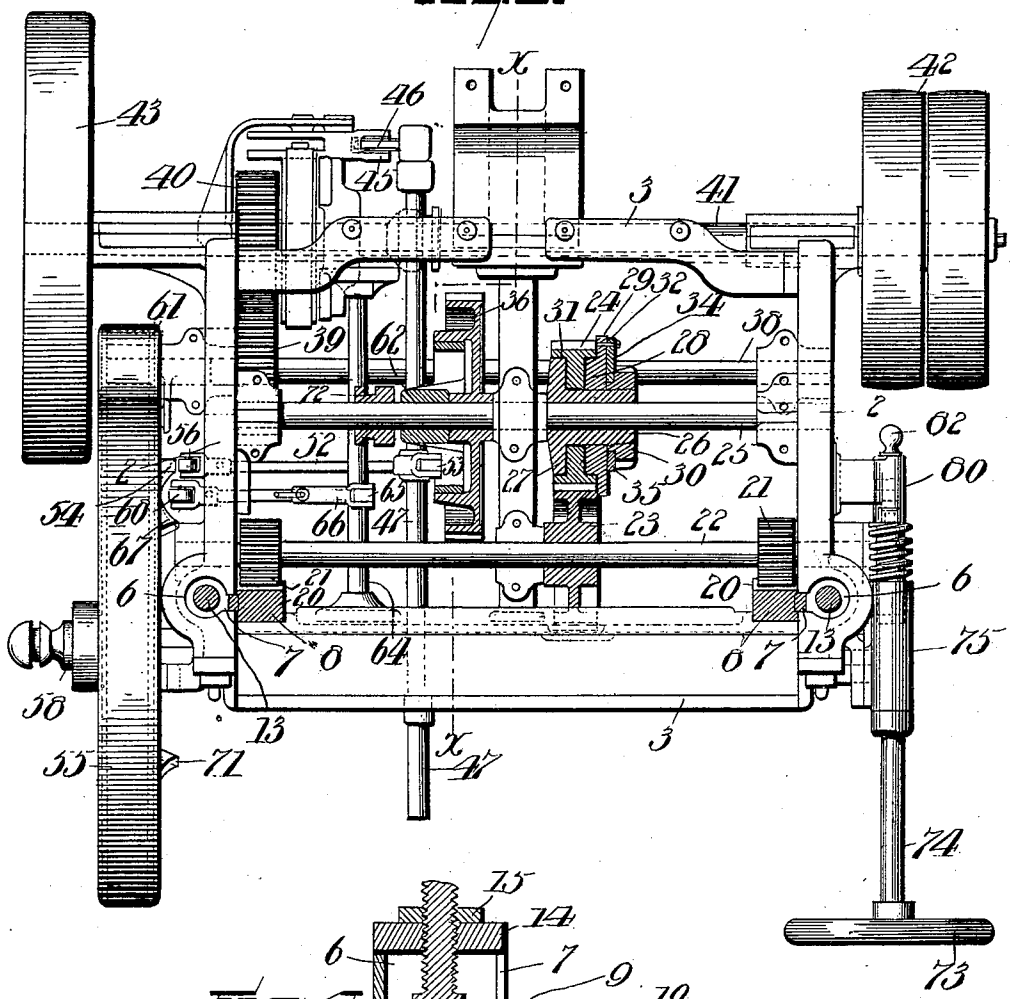
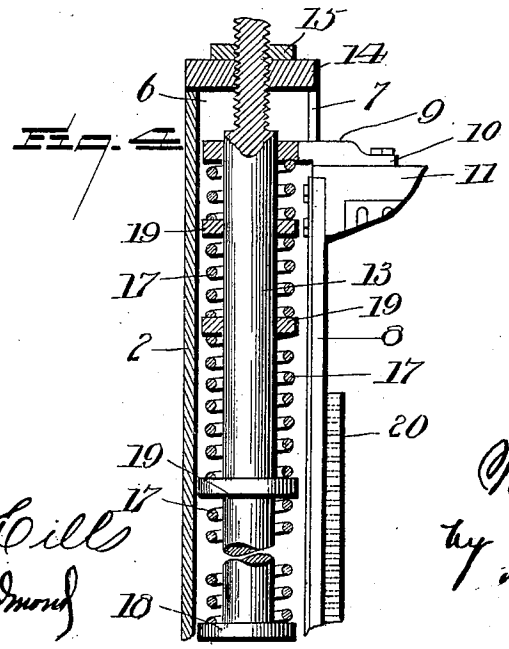


Fig. 2.



Witnesses

L. C. Hill

E. J. Redmond

Inventor.

Niel Gray Jr.

by T. W. Redmond

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,655. Patented Aug. 13, 1901.

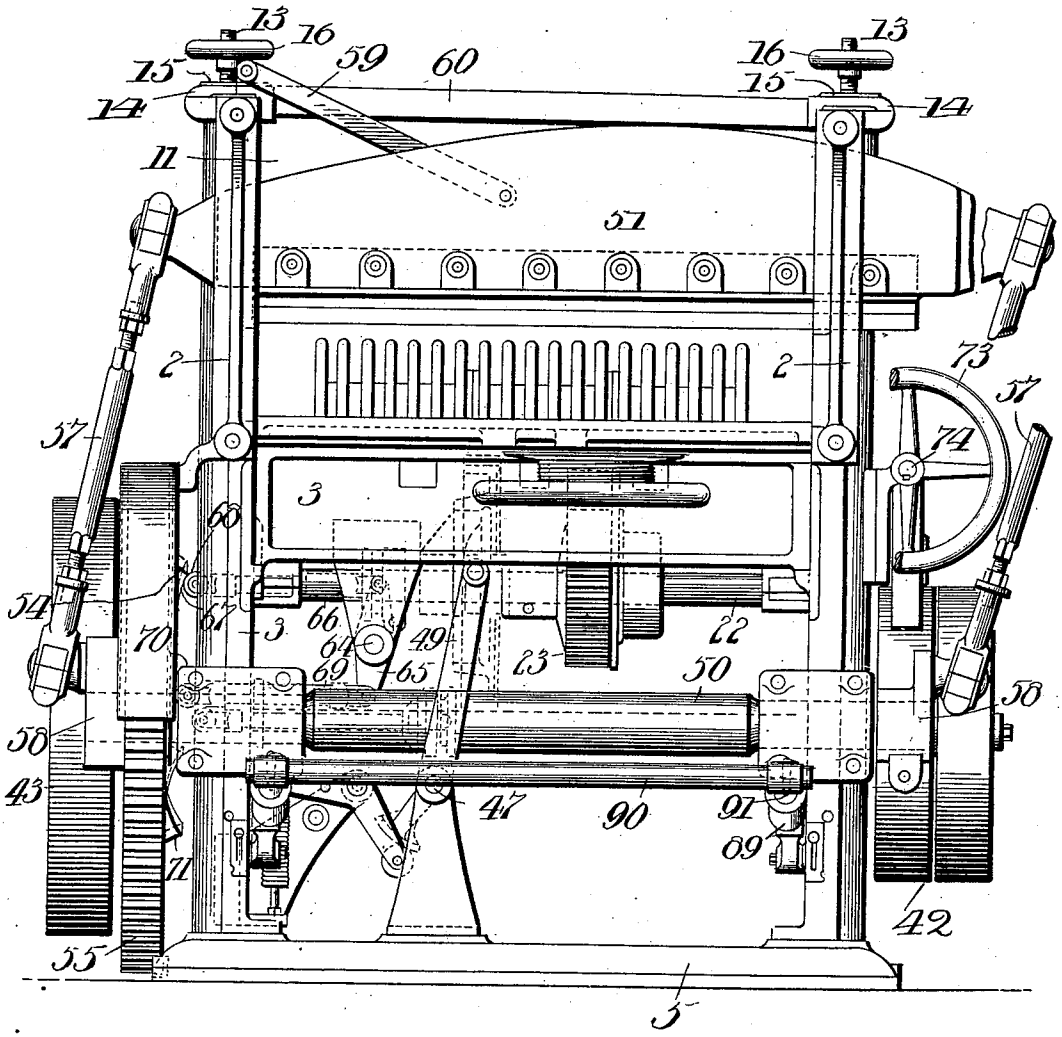
N. GRAY, JR.

PAPER CUTTING MACHINE.

(Application filed May 18, 1900.)

(No Model.) 5 Sheets—Sheet 3.

Fig. 2.



Witnesses:

L. C. Hills

C. J. Redmond

Inventor

Neil Gray Jr.

by W. A. Redmond

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,655. Patented Aug. 13, 1901.

N. GRAY, JR.

PAPER CUTTING MACHINE.

(Application filed May 18, 1900.)

(No Model.) 5 Sheets—Sheet 4.

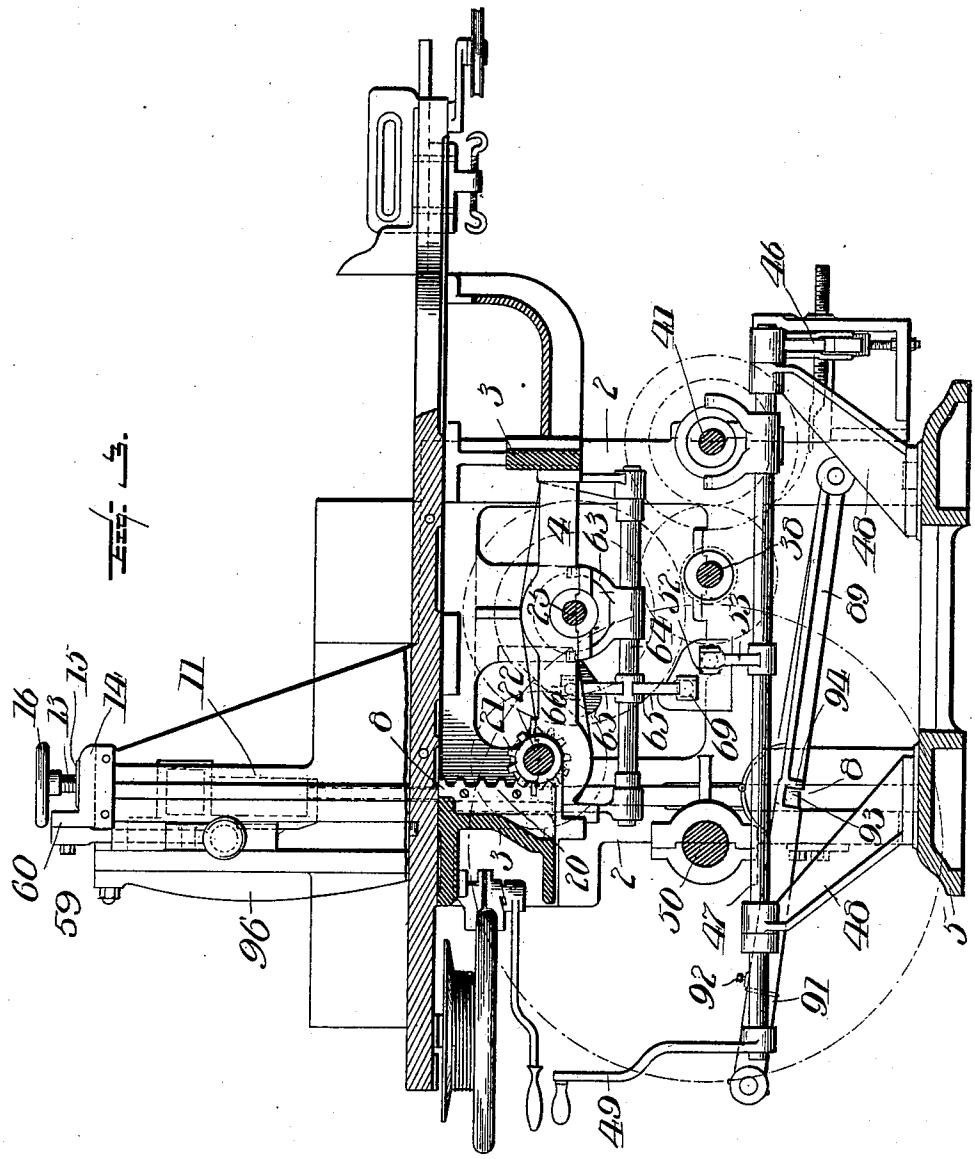


Fig. 4.

Witnesses.
L. C. Hills
E. J. Redmond

Inventor
Mel Gray Jr.
by W. A. Redmond
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 680,655. Patented Aug. 13, 1901.

N. GRAY, JR.

PAPER CUTTING MACHINE.

(Application filed May 18, 1900.)

(No Model.) 5 Sheets—Sheet 5

Fig. 5.

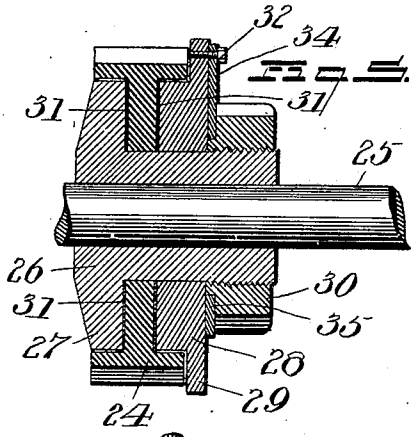


Fig. 6.

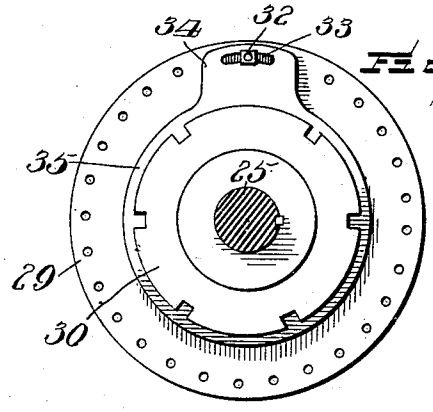


Fig. 7.

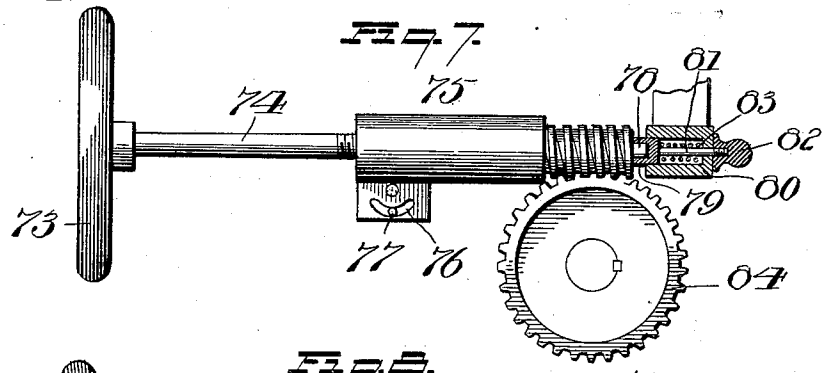


Fig. 8.

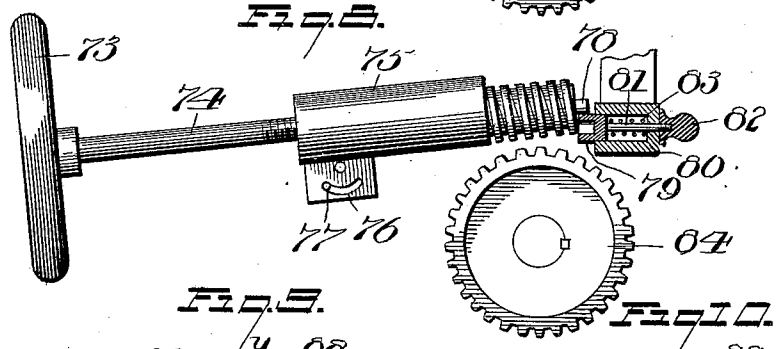


Fig. 9.

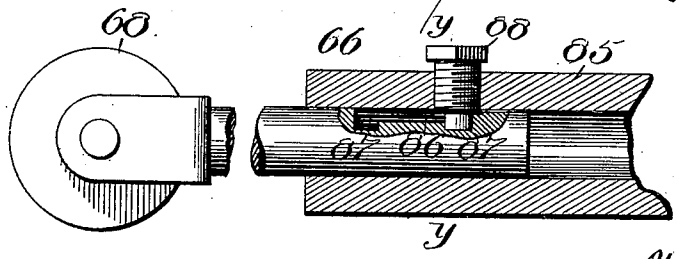
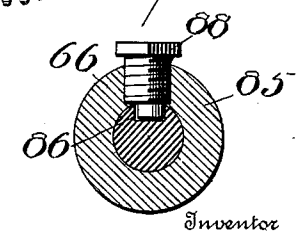


Fig. 10.



Witnesses

L. C. Hills

C. J. Redmond

Inventor

Neil Gray Jr.

by W. A. Redmond

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NIEL GRAY, JR., OF OSWEGO, NEW YORK, ASSIGNOR TO OSWEGO MACHINE WORKS, OF SAME PLACE.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 680,655, dated August 13, 1901.

Application filed May 18, 1900. Serial No. 17,125. (No model.)

To all whom it may concern:

Be it known that I, NIEL GRAY, Jr., a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented certain new and useful Improvements in Paper-Cutting Machines; and I do 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 paper-cutting machines; and it has for its object to provide a machine the working parts of which are simple and durable and adapted to all the different kinds of work to which such machines are applied; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of the rear end of the machine. Fig. 1ª is a plan view of the machine with the bed-plate or table removed and having certain of the working parts in section; Fig. 2, a front elevation; Fig. 3, a vertical section on the line *x x*, Fig. 1ª, showing the bed-plate in position and partly in section, all that part of the machine above said bed-plate being shown in elevation; Fig. 4, an enlarged detail view, in vertical section, of the means for automatically raising the clamp; Fig. 5, a detail vertical section of the friction device for operating the clamp; Fig. 6, a detail front view of said friction device; Fig. 7, a detail side view of the means for operating the clamp by hand; Fig. 8, a similar view of the said means, showing it in its inoperative position; Fig. 9, a detail view of the device for adjusting the means for throwing the machine into operation; and Fig. 10, a vertical section on the line *y y*, Fig. 9.

Similar numerals refer to similar parts throughout all the views.

The frame of my machine consists of the side pieces 2, connected together by the front and rear beams 3, and the centrally-arranged longitudinal beam 4, connecting the said front and rear beams 3, the whole resting on a solidly-cast base-plate 5, which provides for the inequalities of foundations. In the side pieces 2 are formed the vertically-extending pockets 6, said pockets being located at points near the front edge of the side pieces and directly opposite each other, as best shown in Fig. 1ª. The pockets 6 preferably extend the full length or height of the side pieces, and a slot 7 is formed in the contiguous walls thereof, in which the strap-bars 8 work and through which the arms 9 of brackets 10, secured to the top of the clamp 11 at each end thereof, extend. (See Fig. 4.) The ends of the arms 9 are enlarged and perforated to receive the rods 13, arranged in said pockets, and which extend up and through caps 14 and are held in place by nuts 15, screwed onto the reduced threaded ends of said rods. A hand-wheel 16 is provided for each rod, whereby it may be adjusted in order to increase or decrease the tension of the springs 17, surrounding said rods within the pockets. The lower ends of the rods 13 are each provided with a fixed washer 18, on which the lower ends of the springs 17 rest, and where, as is shown, a number of springs 17 are employed, as is the preferred arrangement, they are separated by washers 19, arranged loosely on the rod 13, and the upper end of the top spring of the series bears against the enlarged end of the arm 9 of the bracket.

To the strap-bars 8, which are secured at their upper ends to the ends of the clamp, rack-plates 20 are secured, which engage with pinions 21, keyed to a shaft 22, having its bearings in the side frames, whereby the clamp is brought down upon the paper on the table or bed-plate of the machine when the said shaft is revolved in one direction. On the shaft 22 is keyed a gear-wheel 23, which is engaged by a gear-wheel 24, forming a part of a friction device secured to a shaft 25, having its bearings in the side frames and on the central beam 4 of the frame.

The friction device consists of the hub or sleeve 26, formed with a flange 27, said hub or sleeve being keyed to said shaft 25, the gear-ring 24, fitted on said sleeve, the disk 28, having a flange 29 also fitted on said sleeve, the pressure-adjusting nut 30, screwed onto the end of said sleeve, and the interposed friction-washers 31. (See Figs. 5 and 6.) The nut 30 may be turned by a spanner until the requisite pressure has been produced, and is prevented from working loose by a bolt 32, inserted through a slot 33, formed in a projection

34 from a locking-ring 35, which is secured to the inner face of the nut 30 and entering one of a series of perforations 36, formed in the flange 29 of the disk 28, thereby locking the nut in its adjusted position. The projection 34 also serves as an index of the approximate pressure produced, so that the operator may to a certain extent gage the pressure it is necessary to use on the different kinds of work to which the machine may be applied. The screwing up of the nut carries with it the ring 35, and the degree of pressure is thus approximately ascertained according to the position occupied by the projection 34, and the bolt 32 locks it in its adjusted position.

A gear 36, which forms the outside ring of a friction-clutch 62 (similar to the Edmeston clutch described and illustrated on page 111, Figs. 279 and 280, *Manual of Machine Drawing and Design*, by Low & Bevis) on shaft 25 meshes with a pinion 37 on a shaft 38, and the latter is driven by a gear 39 thereon in mesh with a gear 40, loosely mounted on the main shaft 41, which is connected through the pulleys 42 with the power and its motion steadied by the fly-wheel 43.

A suitable clutch mechanism 45 is arranged on the shaft 41 to engage the gear 40 in order to start the machine, said clutch being thrown in by means of a lever 46, fast on the end of a shaft 47, journaled longitudinally of the machine in the posts 48 at front and rear of the frame, and provided with a crank-handle 49 at the front end, said lever being suitably connected to said clutch, and the machine is automatically stopped after the crank-shaft 50 has made one revolution, and thus brought the knife-bar 51 to its raised position, by means of a shifter-rod 52, connected to a lever 53, secured on the shaft 47, said rod 52 being moved longitudinally by a cam-faced knocker 54, projecting from the side of a gear-wheel 55 on one end of the crank-shaft 50 and engaging a roller 56 on the end of said rod 52. The knife-bar is connected to rods 57 at each end by ball-bearings, and said rods are connected to cranks 58 on the ends of the shaft 50 by ball-bearings, and a shear-cutting movement is imparted to said knife-bar by the bar 59, connected to the top cross-piece 60 and to said knife-bar. The crank-shaft 50 is driven by means of a pinion 61 on shaft 38 meshing with the gear-wheel 55. The gear 36 is thrown into operation by a forked lever 63 on a shaft 64, journaled in bearings in the rear and front beams of the frame, which engage the spool 72 of the clutch 62, said shaft being turned on its axis by the arms 65, projecting from a hub secured to said shaft, and one of which arms projects upwardly and the other downwardly from said shaft. The upper arm is connected to a rod 66, which is moved by a cam-faced knocker 67 on gear-wheel 55, which engages a roller 68, journaled in the end of said arm, and the lower arm 65 is operated by a similar rod 69, carrying a roller 70, which is engaged by a cam-faced knocker 71 on gear-wheel 55. The knockers are so arranged on the gear-wheels 55 that knocker 67 engages rod 66 as soon as said gear-wheel starts and throws in the spool 72 of the clutch for coupling gear 36, which revolves shaft 25 and through gears 24 and 23 imparts motion to shaft 22, thus operating pinions 21 and strap-bars 8 to bring the clamp down upon the work, and as soon as said gear-wheel 55 makes a one-half revolution, the knife then being at the bottom of its stroke, the knocker 71 engages rod 69 and throws out the spool 72, thereby uncoupling gear 36 and stopping and freeing the shafts 25 and 22, and the springs 17 then come into play to raise the clamp instantly to its raised or top position. The clutch 45 is still engaged, however, and continues to drive gear-wheel 55 around until the knocker 54 engages rod 52 and throws the clutch 45 out and stops the machine. The clamp may be brought down by hand, when desired, by means of the hand-wheel 73, secured on the end of a worm-shaft 74, journaled in a bracket 75, pivoted to the side of the frame and formed with an arc-shaped slot 76, through which a guide-stud 77 extends from the frame to limit the movement of the bracket. At the end of the worm-shaft a pin 78 is secured, which is adapted to enter a socket formed in the end of a plunger 79, located in a barrel 80, secured to the frame of the machine, and having a stem 81 projecting through the end of the barrel and provided with a knob 82, whereby said plunger may be moved against the pressure of a spring 83, surrounding said stem within the barrel. The worm-shaft engages a worm-wheel 84, fast on the shaft 22. (See detail views, Figs. 7 and 8.) When it is desired to operate the clamp by hand, the knob 82 is pulled outward, thus drawing the plunger into the barrel and permitting the worm-shaft, which when not in use rests on the end of the plunger, to drop down and into engagement with the worm-wheel 84, in which position it is held by the plunger, which as soon as it is released by the operator is forced over the pin 78, as shown in Fig. 7. To release the worm-shaft, it is only necessary to pull out the knob, when the shaft may be titled, and then upon releasing the plunger the spring throws it out, so that it acts as a support for the end of the worm-shaft. Also in order to prevent knocker 67 engaging rod 66 when the clamp is being hand-operated the said rod is formed of two parts, consisting of a sleeve 85 and a bar 89, whereby it may be shortened, so as to remove the roller 68 out of the path of the said knocker 67.

As best shown in Figs. 9 and 10, the rod or bar 89 is formed with a longitudinal groove 86, terminating in recesses 87 at each end, into which the end of a bolt 88 enters through an opening in the sleeve 85 to lock the bar or rod in its adjusting position, while the groove serves to prevent the rod turning in the sleeve

when the bolt is withdrawn from the recesses by engaging the reduced end of said bolt while adjustment is being made. The clamp may also be brought down by a foot-treadle, consisting of the levers 89, pivoted to the rear end of the frame and connected at the front thereof by a bar 90, said bar being secured to bars or rods 91, which enter sockets formed in the outer ends of the levers 89, so as to be adjustable therein. A bolt 92 serves to hold the bars or rods 91 in their adjusted positions.

The rack-bars 8, as shown in Fig. 3, extend nearly to the bottom of the frame and are provided with pins 93, over which a slot 94 in the levers 89 fit. The treadle may be so balanced as to put less work on the clamp-lifting springs.

To mitigate the violence of the blow which results from the quick return of the clamp to the top by the springs, suitable buffers or stops may be provided. The guide-bars 96, forming the front support for the knife-bar, are removable in order to provide for the wear of the knife-bar or its ways in the frames. The back gage 95 may be adjusted by a cable, as shown, or by a screw-rod or any other preferred means.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a paper-cutting machine of a clamp having brackets at each end thereof, springs arranged to be compressed by the descent of said clamp, and means for lowering said clamp to the paper and to automatically release the pressure thereon, whereby the springs may return the clamp to its raised position.

2. The combination, in a paper-cutting machine, of a clamp, means for lowering said clamp to the paper, brackets projecting from said clamp, and springs arranged in pockets in the frame for returning said clamp to its raised position.

3. The combination, in a paper-cutting machine, of a frame having vertical pockets therein, springs arranged in said pockets, a clamp, brackets projecting from said clamp and engaging said springs, rack-bars secured to said clamp, a shaft, pinions fast on said shaft and engaging said rack-bars, and means for rotating said shaft.

4. The combination, in a paper-cutting machine, of a frame having pockets formed therein, rods arranged in said pockets, springs surrounding said rods, means for adjusting the tension of the springs, a clamp, brackets projecting from said clamp and engaging said springs, and means for lowering said clamp to the paper.

5. The combination, in a paper-cutting machine, of a frame having slotted pockets formed therein, springs arranged in said pockets, a clamp, brackets projecting from said clamp and engaging said springs, rack-bars secured to said clamp, and working in the slots of the pockets, a shaft, pinions fast on said shaft and engaging said rack-bars, and means for automatically connecting said shaft with the driving power.

6. The combination, in a paper-cutting machine, of a hand operating device for lowering the clamp to the paper comprising a pivoted bracket, a worm-shaft having a reduced end journaled to said bracket, a barrel fixed to the frame, and a spring-held plunger having a socket to receive the reduced end of the worm-shaft.

7. The combination, in a paper-cutting machine, of a hand operating device for lowering the clamp to the paper, consisting of a pivoted bracket, means for limiting the movement of the bracket, a worm-shaft journaled in the bracket, and having a reduced end, a barrel fixed to the frame, a socketed plunger having a stem arranged in said barrel, a spring pressing against said plunger, and a knob for said stem.

8. A friction device for exerting pressure on the clamps of paper-cutting machines, consisting of a sleeve having screw-threads at one end and a flange at the other end, a flanged disk having perforations around its periphery, a gear-ring arranged between said disk and the flange of said ring-gear, a tightening-nut run on said sleeve, a locking-ring having a slotted projection secured to the inner face of said nut, and a bolt for locking said nut in its adjusted position.

9. The combination, in a paper-cutting machine, of a clamp, rack-bars connected to said clamp, a shaft, pinions engaging said rack-bars, a gear-wheel on said shaft, a counter-shaft carrying a friction device having a ring-gear engaging said gear-wheel, a clutch for coupling said last-named shaft to the power, a longitudinal shaft, rock levers or arms on said longitudinal shaft, shifter-rods connected to said arms, a gear-wheel and knockers on said wheel for engaging said shifter-rods.

10. The combination, in a paper-cutting machine, of a main shaft, a gear-wheel loosely mounted on said shaft, a clutch arranged on said shaft, a shaft arranged longitudinal of and journaled in bearings on the frame of the machine, means for connecting said shaft and the clutch, a lever or arm projecting from said shaft, a shifter-rod connected at one end to said lever or arm for turning said shaft on its axis, a crank-shaft, and a gear-wheel having a cam-faced knocker fixed on the crank-shaft for imparting a longitudinal movement to the shifter-rod.

11. A shifter-rod consisting of a sleeve, a rod having a longitudinal groove and recesses at the ends of said groove, a bolt for securing said sleeve and rod together, and a roller journaled in the end of said rod.

In testimony whereof I affix my signature in presence of two witnesses.

NIEL GRAY, JR.

Witnesses:
F. E. SWEETLAND,
M. S. HAMMER.