(No Model.)

3 Sheets—Sheet 1.

C. SEYBOLD.

PAPER CUTTING MACHINE.

No. 511,972.

Patented Jan. 2, 1894.

FIG. 1.

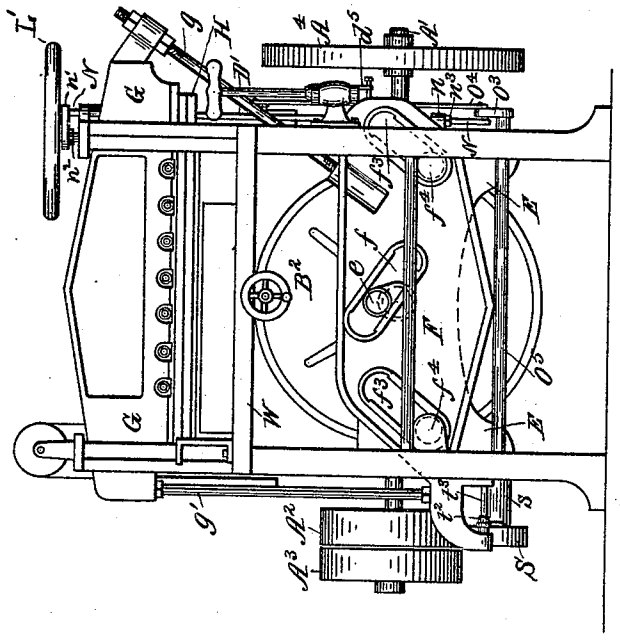
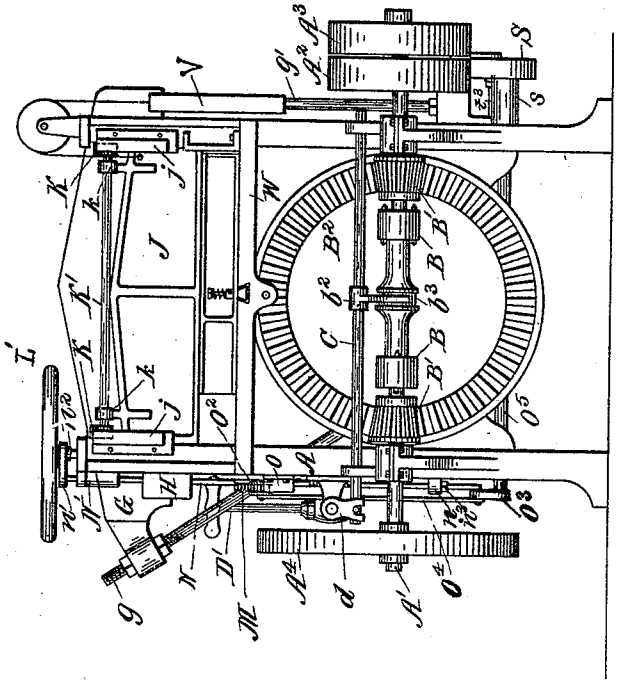


FIG. 2.



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(No Model.) 3 Sheets—Sheet 2.

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FIG. 7.

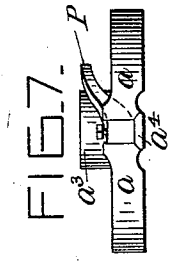


FIG. 8.

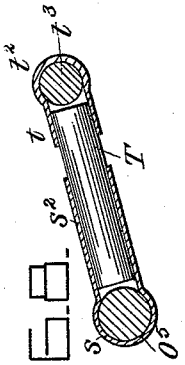


FIG. 6.

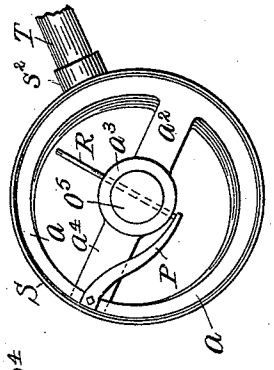
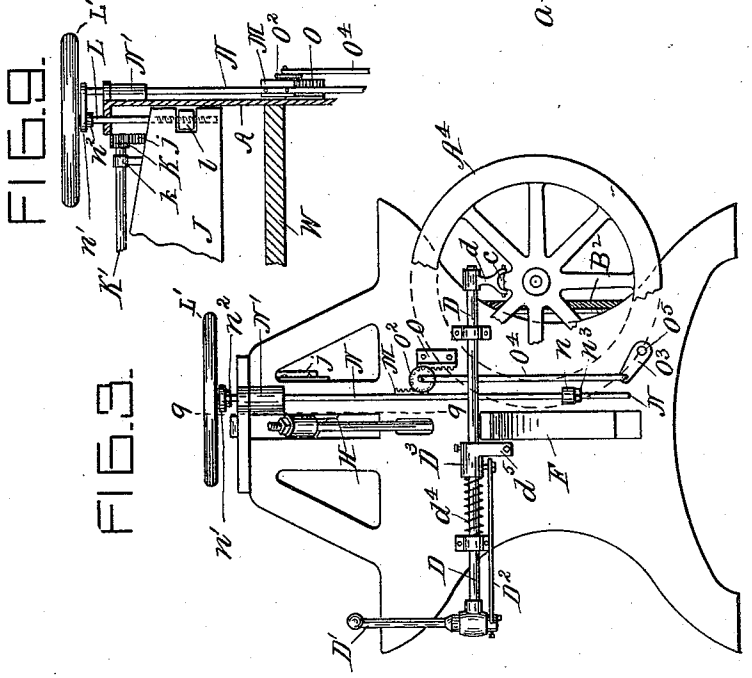


FIG. 9.



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(No Model.) 3 Sheets—Sheet 3.

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FIG 4

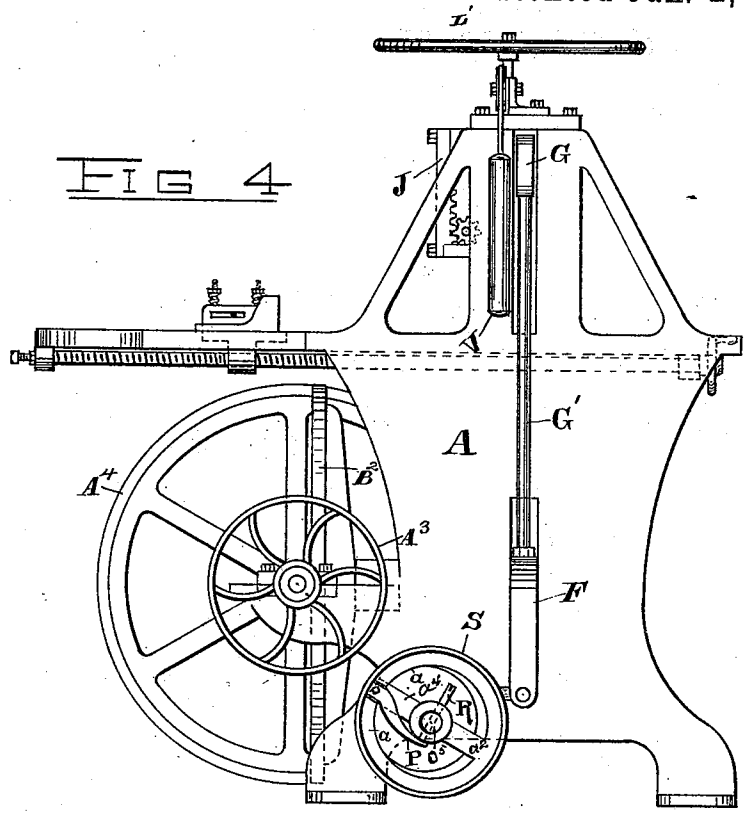


FIG 10

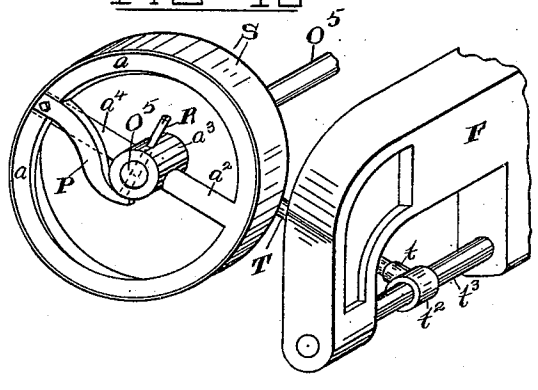
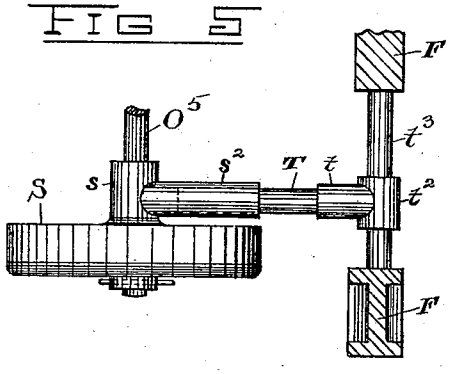


FIG 5



WITNESSES

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CHARLES SEYBOLD, OF DAYTON, OHIO.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 511,972, dated January 2, 1894.

Application filed March 2, 1893. Serial No. 464,359. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, residing at Dayton, Montgomery county, State of Ohio, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention has for its object certain improvements in cutting machines having a clamp-bar for moving down upon the paper and clamping it firmly to place preparatory to being cut, and a knife at one side of said clamp-bar, substantially as set forth in my Letters Patent No. 464,202, dated December 1, 1891, my improvements consisting in the means hereinafter set forth for operating said clamp-bar and stopping it in its downward movement at a certain determinate degree of pressure on the paper to be cut, said downward movement of the clamp-bar being stopped automatically, as hereinafter set forth and claimed.

In the accompanying drawings: Figure 1, is a front elevation of a machine embodying my invention, and Fig. 2, is a rear elevation of same, in which views the knife and clamp-bar are shown elevated. Fig. 3, is an end elevation of the machine shown in Figs. 1 and 2, said view being taken from right hand side of Fig. 1, a portion of the balance wheel being broken away, while the stop-lug D^3 is shown pulled forward away from the end of the drive-bar F, preparatory to starting the machine. Fig. 4 is an end view of the machine taken from left hand of Fig. 1. Fig. 5, is a plan view of the friction device shown in Fig. 4, attached to the driving-bar, the latter being broken away; and Fig. 6, is a front face view of same, said view showing said friction device detached from the drive-bar. Fig. 7, is a top view of the split-band and its expanding device which forms a part of the friction device shown in Fig. 6, said band being detached from its outer shell-band. Fig. 8, is a section on dotted line 8, 8, of Fig. 5, also a section through the sleeve in the end of drive-bar F, showing the connecting rod in position. Fig. 9, is a section on dotted line 9, 9, of Fig. 3, looking toward right hand therein. Fig. 10 is a rear perspective view of one end of the driving-bar and its friction device attached thereto.

A, represents the main end frames; A', the main driving shaft on which is mounted the sliding clutch B, as are also the two pinions B' with which said clutch engages and disengages to stop and start the machine. To the sliding-rod C is rigidly attached a bifurcated lug b^2, the forked portions of which engage within the annular recess b^3 of the clutch. One end of rod C is loosely connected to the operating bar or rod D by means of the bifurcated lug d rigidly connected to said rod D, which latter is provided on its outer end with a handle D'.

A^2, and A^3, represent the usual tight and loose pulleys, and A^4 a balance wheel.

The pinions B' mesh with the large gear wheel B^2 journaled in cross-frame E, one end of said journal having a crank-extension e, the horizontal portion of which projects through an oblique opening f in the driving-bar F, which latter is connected to the knife-head G by means of connecting-rods g and g'. The knife H is adjustably connected to said head in the usual manner. The driving-bar is provided, near each end, with the elongated angular openings f^3, within which the guide-rollers f^4 operate, as set forth in my aforesaid patent. On shaft D is mounted a sliding lug D^3, having angular extensions d^5, said lug being connected to the lower portion of handle D' by means of bar D^2, said lug being retained in its normal position (opposite the opening in one end frame, in which opening one end of drive-bar F ascends in its up-stroke) by means of coiled spring d^4.

To operate the knife by means of the mechanism described, the operator turns the handle D' which draws the lug D^3 forward, at which time he tilts said handle or vibrates it inward, which movement turns the rod D which in turn slides the rod C in one direction, the sliding of which causes one end of clutch B to engage with one of the pinions B', at which time motion is imparted through the latter to the main gear B^2. The rotation of the latter, through the medium of its crank e, causes the driving-bar F and its connected knife-head to descend, thus making a cut. So soon as the machine is started, the operator releases his hold on the handle, at which time the stop-lug D^3 is forced back over the opening in the one end frame; and, after the cut is made, the continued rotation of gear B^2 will cause the drive-bar F to ascend and strike one of the projections d^5 of said lug, which

will partially rotate rod D and thus release the clutch from its pinion through the medium of rod C and bifurcated lug d, thus automatically stopping the machine.

The aforedescribed construction and operation are the same as that set forth and claimed in my aforesaid patent, and are repeated here only for the purpose of setting forth an operative machine.

The clamp-bar, J, is provided with the two bearings k, one near each end thereof, in which the shaft K′ engages, the latter being provided at each end with a pinion K, which latter engages between the rear face of the knife-head and the flanged plates j, the latter having teeth on their inner faces with which said pinions mesh. This construction is the same as that set forth in my aforesaid patent, and provides for moving both ends of the clamp-bar simultaneously.

L, represents the screw-rod which is provided with a hand-wheel L′, said rod passing through an opening in the top of one end flanged plate, and thence passes through the clamp-bar near one end thereof, the latter being chambered, within which is located the rectangular block l, (see Fig. 9,) the latter having a screw-threaded opening within which the screw-rod engages. As the screw-rod is rotated, the nut l travels up or down thereon to adjust the height of the clamp-bar with reference to the table, W.

M, represents a toothed plate, to which is attached a portion of the vertical rod, N. The latter at its lower end portion passes through the bearing lug n on the end frame (see Fig. 3) the top of said rod being rigidly connected to one end of horizontal plate n'. The screw rod passes loosely through the opposite end of plate n',—a set-collar n^2 retaining it to place thereon.

N′, represents a bearing lug at top of the end frame through which the rod N passes. This rod N is provided on its lower end with a set-nut n^3 which is designed to come into contact with lug n, and thus limit the upward movement of the clamp-bar, as will presently appear.

To the end frame is rigidly attached the toothed bracket, O, between which and toothed plate M is interposed a pinion O^2, the journal of which is connected to the crank-lever O^3 by means of a connecting rod O^4, (see Fig. 3) the opposite end of said crank-lever being rigidly connected to one end of the transverse shaft, O^5. To the opposite end of shaft, O^5, is keyed the split-band, which latter consists of the two peripheral portions a a cast or formed in one piece with the spoke a^2, which latter is cast with the hub a^3, the latter having an opposite spoke a^4 the front portion of which projects outward beneath the separated end portions of the peripheral band, as shown in Figs. 6 and 7. To the outer end of spoke a^4 is pivoted one end of lever P, which latter engages between the end portions of the band a—a, as shown. A screw-rod, R, is passed through suitable screw-threaded openings in hub a^3 and also through the shaft, the lower end of said screw-rod impinging against the free end portion of lever P, as shown. To expand or contract this split-band, all that is required is simply to turn the rod R in the proper direction, which will cause the lever P to act upon the portions a a.

A shell-band, S, is placed over the split-band a—a, the former having a sleeve extension s which fits loosely over shaft O^5, the said extension, s, being provided with the angular socket s^2, as shown in Figs. 4 and 5. Within this socket is placed one end of connecting rod, T, the other end of said rod engaging within a socket t, which latter is cast with the bearing t^2 (see Fig. 5) which bearing rotates and slides upon shaft t^3 in the lower chamber formed by the yoke-shaped extension of the driving-bar F, as more clearly shown in Fig. 1. The clamp-bar, J, is also provided with a weight, V, to assist in counterbalancing the weight of the said clamp-bar.

I will now describe the operation of the clamp-bar. When desired to operate said clamp by hand (that is, to apply pressure thereto) the operator loosens the screw-bolt, R, which will permit the split-band a—a to revolve or play freely within its shell-band, S, and then turns the hand-wheel L′ in the proper direction. The rotation of the screw-rod L, through the medium of block l, will cause said clamp to descend and compress the paper to be cut. The clamp is elevated by hand by a reverse rotation of the hand-wheel.

To convert the machine into an automatic power-clamp cutter, all that is required is simply to turn the bolt R in proper direction to apply pressure onto the free end of lever P, and the forcing down of said lever at its free end will cause the band a—a to expand within the shell, S, thus producing friction,—the amount of friction to be produced being governed by the amount of pressure desired to compress the paper before cutting. Having regulated the friction device to produce the required pressure on the clamp-bar, the operator starts the machine, in the manner hereinbefore set forth; and, as the driving-bar, F, descends at an angle, the bearing t^2, (see Fig. 1) will slide on the rod t^3, and, through the medium of sockets t and s^2, rod T, shell S and split-band a—a, the downward movement of bar F will cause the shaft O^5 to describe a partial rotation. The rotation of shaft O^5 will cause the free end of crank O^3 to descend, which in turn will cause the pinion O^2 to descend in a vertical line. The pinion O^2 being located between the stationary toothed rack O and the movable toothed plate M, any downward movement of said pinion will cause the latter to rotate and carry the plate M downward at a speed much greater than what the center of the pinion travels in a vertical line. The downward movement of plate M, through the medium of rod N, plate n' and screw L, will cause the clamp-bar to become

lowered and compress the paper to be cut. So soon as the requisite degree of pressure is applied to the bundle of paper, the split-band *a*—*a* will slip within its band S, thus permitting the drive-bar F and knife H to continue to descend and make a cut. A reverse or upward movement of the driving-bar will cause the clamp-bar to elevate in advance of the knife, through the medium of the friction device and connecting mechanism aforedescribed.

The advantages of my improved cutting machine attachments are apparent. Through the medium of the friction device attached to the driving-bar, I am enabled to drive both the knife and clamp-bar simultaneously; and, by reason of the vertically movable pinion O^2 and toothed plate M, I am enabled to drive said clamp-bar at a much greater speed than what the knife is driven, thus permitting said clamp to descend and compress the bundle of papers before the knife reaches it. The split-band and expanding device mounted within the shell-band, afford an effective friction device for automatically stopping the downward movement of the clamp-bar at a determinate degree of pressure thereon, without interfering with the movement of the knife. The upward movement of the clamp-bar is assisted by reason of the counter-weight, V, and is stopped by means of the set-nut n^3 striking the stud *n* on the end frame. The height to which the clamp-bar may be elevated is regulated by lowering or raising the set-nut n^3 on rod N.

The machine is readily converted into a hand-clamp cutter, by simply loosening the bolt R, in the manner aforestated. It will be seen that my improved machine combines all the advantages of a power or of a hand-clamp cutter, as desired.

While it is preferred to employ the friction device herein specifically set forth, in connection with the driving-bar, for operating the clamp, any other suitable friction deviec may be attached to said driving-bar for a like purpose.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a cutting machine having a vertically movable clamp-bar and knife adapted to be operated by a driving-bar, as F, the transverse shaft O^5 having on one end thereof a friction device attached to one end of said driving-bar, the opposite end of said shaft being connected to one end of the clamp-bar by means of lever O^3, rod O^4, pinion O^2, toothed plates O and M, plate *n'*, screw-rod L and nut *l*, and suitable means for operating said driving-bar.

2. In a cutting machine having a vertically movable clamp-bar and knife adapted to be operated by a driving-bar substantially as set forth, the transverse shaft O^5 having on one end thereof a friction device or wheel attached to one end of the said driving-bar, and suitable mechanism intermediate between the opposite end of said shaft and the said clamp-bar, whereby said clamp-bar is lowered or raised by the partial rotation of said shaft, substantially as set forth.

3. In a cutting machine having a vertically movable clamp-bar, the screw-rod L attached to one end of said clamp-bar substantially as set forth, rod N attached to said screw-rod, toothed plate M attached to rod N, toothed bracket O rigidly attached to end frame, pinion O^2 intermediate between said plate and bracket, rod O^4 attached to the journal of said pinion at one end, the opposite end of said rod being connected to crank O^3, which latter is connected to one end of shaft O^5, and suitable means for partially rotating the latter, substantially as set forth.

4. In a cutting machine having a vertically movable clamp-bar and knife, the screw-rod attached to one end of said clamp-bar, rod N attached to said screw-rod, toothed plate M attached to rod N, toothed bracket O rigidly attached to the frame, and vertically movable pinion O^2 mounted between said plate and bracket, and suitable operative mechanism for raising and lowering said pinion.

5. In a cutting machine having a vertically movable clamp-bar and knife operated by a driving-bar as set forth, the shaft O^5 having loosely connected to one end thereof the shell-band S with a friction split-band *a*—*a* therein, lever P and screw-bolt R for expanding said band, said shell-band being connected to one end of said driving-bar, and suitable connecting mechanism between the opposite end of said shaft and the clamp-bar for raising and lowering the latter when said shaft is partially rotated, as set forth.

6. In a cutting machine having a vertically movable clamp-bar and knife adapted to be operated by a driving-bar as set forth, the friction device attached to shaft O^5 and to one end of said driving-bar, screw-rod L attached to the clamp-bar as set forth, rod N attached to said screw-rod, toothed plate M on rod N, toothed bracket O on the frame, vertically movable pinion O^2 between said plate and bracket, and connecting mechanism between said pinion and the opposite end of the shaft to which the friction device is connected, substantially as set forth.

7. In a cutting machine constructed substantially as set forth, and having a clamp bar the driving-bar having in one yoked end thereof the shaft t^3 with a socket-bearing *t* thereon, in combination with shell-band S, bearing sleeve *s* and socket s^2 thereon, connecting rod T between said sockets, said shell-band having a friction device therein, the latter being rigidly attached to shaft O^5, and suitable connecting mechanism between said shaft and the clamp-bar for raising and lowering the latter, as set forth.

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