

(No Model.)

3 Sheets—Sheet 1.

H. DENNEY.

MACHINE FOR CUTTING OFF PAPER TUBES.

No. 549,707.

Patented Nov. 12, 1895.

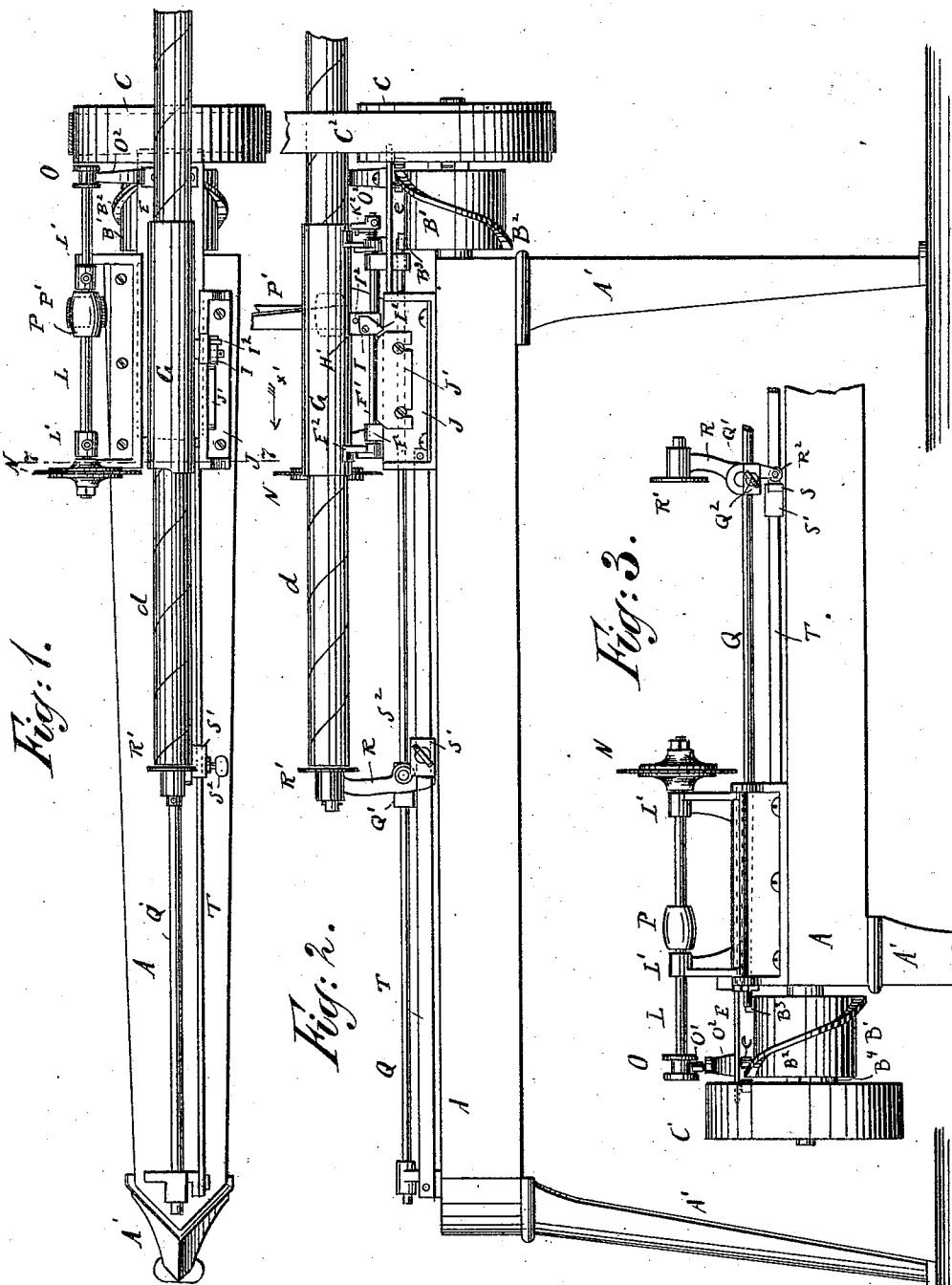


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:
Harry Willard Griffiths
Marion Hall

INVENTOR
H. Denney
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ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

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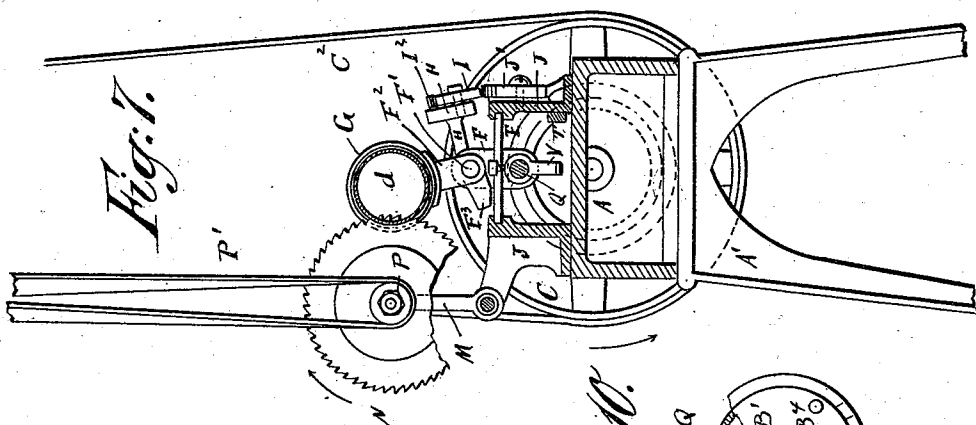


Fig. 10.

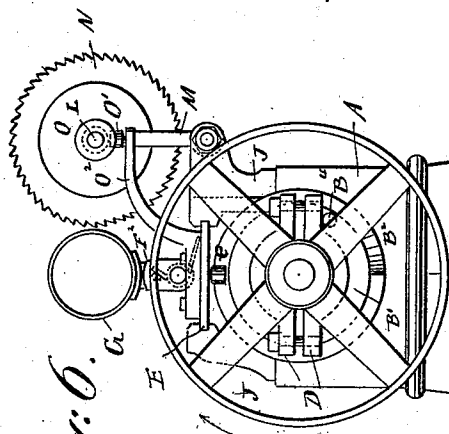
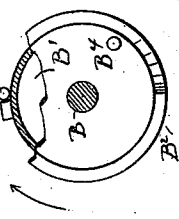


Fig. 6.

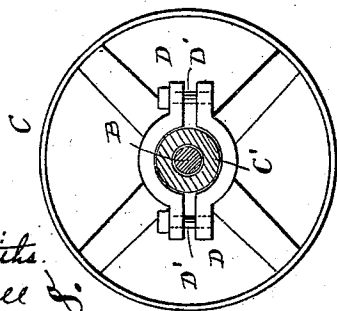
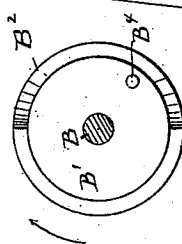


Fig. 8.

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Fig. 9.



INVENTOR
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UNITED STATES PATENT OFFICE.

HARMER DENNEY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES MAILING TUBE COMPANY, OF CHICAGO, ILLINOIS.

MACHINE FOR CUTTING OFF PAPER TUBES.

SPECIFICATION forming part of Letters Patent No. 549,707, dated November 12, 1895.

Application filed January 18, 1893. Serial No. 458,756. (No model.)

To all whom it may concern:

Be it known that I, HARMER DENNEY, a citizen of the United States, and a resident of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Machines for Cutting Off Paper Tubes, of which the following is a specification.

Paper tubes are now generally made by machines which produce such paper tubes in continuous lengths. In order to make such tubes serviceable as mailing-tubes and for other purposes it is necessary to cut them in certain lengths, and it is desirable to have these lengths as uniform as possible.

The object of my invention is to provide a machine which is to be used in conjunction with and operated adjacent to a paper-tube machine for the purpose of automatically cutting off the tubes at given lengths.

In the accompanying drawings, Figure 1 is a plan view of my improved machine for cutting paper tubes. Fig. 2 is a view of one side of the same. Fig. 3 is a view of the other side of the same, parts being broken out. Fig. 4 is a plan view of the machine, parts being broken out and parts being in section on the line 4 4 of Fig. 5. Fig. 5 is a vertical longitudinal sectional view on the line 5 5 of Fig. 4. Fig. 6 is an end view of the machine. Fig. 7 is a transverse sectional view on the line 7 7 of Fig. 1, parts being broken out. Fig. 8 is a transverse sectional view through the hub of the friction-pulley. Fig. 9 is an end view of the cam-pulley; and Fig. 10 is a like view, parts being broken out and others in section.

Similar letters of reference indicate corresponding parts.

The machine is constructed with the longitudinal frame A, having lugs A'. From one end of said frame A the fixed shaft B projects, and on the same a cam-pulley B' is mounted, which is provided with the elliptical cam-track B², the plane of which is at an angle to the axis of the pulley, said cam-track projecting from the periphery of said pulley B' in the shape of a ridge or spline. The pulley B' is also provided at its inner end with a lug or tooth B³ at the periphery and at its outer end with a projecting pin B⁴.

A belt-pulley C, provided with the hub C', is loosely mounted on the shaft B and is driven by a belt C² passing over a suitable counter-shaft. (Not shown.) Two yokes D are united by bolts D' and clamped friction-tight on the hub C' of the pulley C, which yokes in rotating can strike against the pin B⁴, projecting from the outer end of the cam-pulley B. A plate E is mounted to slide in the direction of the length of the machine-frame between guide-standards J on the top of said frame, and said plate is provided at one end with two downwardly-projecting pins carrying antifriction-rollers *ee*, in between which rollers the cam ridge or track B² can pass, so that as the pulley B' rotates said cam-track moves the plate E longitudinally in the direction from the pulley and then toward the pulley. On said plate E two standards F are arranged, in which a shaft F' extending in the direction of the length of the plate is mounted to rock, which rocking shaft has upwardly-projecting arms F², to the upper ends of which a guide-tube G for the paper-tube *d* is fastened. A stop-lug F³ projects laterally from the rocking shaft and can rest against the top of the plate E. An arm H projects from the rocking shaft F' in the opposite direction of the stop-lug F³, and to a head H' on the outer end of said arm H a dog I is pivoted, that is provided at its bottom with a bevel I', which dog can swing in one direction but is prevented from swinging in the opposite direction by a stop-pin I², projecting from the head H' on the end of the arm H, directly above the top edge of said dog, as shown in Figs. 1 and 4. To one standard J a vertically-adjustable cam-piece J' is fastened by screws, which cam-piece has its upper corners beveled, as shown in Fig. 2. A spring-wire K is coiled around the rocking shaft F', one end of said spring-wire bearing on the top of the plate E and the other bearing against a pin K', projecting from the end of an arm K² of said rocking shaft, so that by the action of said spring the bottom edge of the head H' of the arm H is pressed upon the top edge of the standard J and the arms F² are held vertically. A shaft L is mounted to rotate on its longitudinal axis in bearings L' of arms M projecting upward from the machine-

frame, and said shaft L can also move in the direction of its length in said bearings L'. A circular saw N is fixed on the shaft L at that end of the shaft in line with the end of the guide-tube G, and on the other end of said shaft L a grooved pulley O is fixed, into the groove of which an antifriction-roller O' passes, that is mounted to turn on the end of a curved arm O², projecting upward from the plate E. A belt-pulley P is mounted on the shaft L, and around the same a driving-belt P' for the saw passes. A rod Q is suitably guided in the machine-frame and in lugs on the under side of the plate E to move in the direction of its length, and on said rod a block Q' is held adjustably by a binding-screw Q². A lever R is pivoted to said block Q' and is provided at its upper end with a disk R', which is in the path of the paper tube *a*, passing through the guide-tube G, and to the lower end of the lever R an antifriction-roller R² is pivoted that rests against the wing S of a block S', held adjustably by a screw S² on a fixed bar T, fastened at one end to a lug of the frame and at the opposite end to a standard J, which bar T is parallel with the longitudinally-movable rod Q. A collar U is held by a screw U' on the rod Q, and is provided with a hook-arm V, the free end of which passes up into a longitudinal slot V' in the plate E. A helical spring W is interposed between the upwardly-projecting part of the hook V and a guide-lug *b* projecting from the under side of the plate E, through which guide-lug the longitudinally-movable rod Q passes.

The operation is as follows: The driving-shaft for the machine is so speeded that when the plate E and shaft L are moved in the direction of the arrow *x'*, Figs. 1 and 4, they move with precisely the same speed as the paper tube *d*, passing through the guide-tube G. Ordinarily the pivoted lever R is in upright position, as shown in Fig. 5. The paper tube *d* from the paper-tube machine passes through the guide-tube G, and the end of said paper tube *d*, striking against the disk R' on the upper end of the lever R, exerts a certain pressure against said disk, whereby the lever R is slightly tilted or swung over in the direction of the arrow *x*², Fig. 5. As the lower end of the lever rests against the lug or abutment S of the block S', held firmly on the bar T, the pivotal point of said lever R must move slightly in the direction of the arrow *x'*. As said pivotal point is on the block Q', which is held securely on the rod Q, said rod Q is also moved in the direction of the arrow *x'* sufficiently to disengage its free end from the projection B³ on the periphery of the cam-pulley B' at the inner end of said pulley. As the yokes D rest against the pin B⁴, projecting from the outer end of the pulley B', they carry the pulley B' around with them, and as soon as the rotation of the pulley B' begins the plate E and the parts thereon are moved

in the direction of the arrow *x'*. The plate E acts on the hook-arm V and moves the rod Q in the direction of the arrow *x'*, and as thereby the fulcrum of the lever R is also moved in the direction of the arrow *x'*, the said lever R can swing down, so as to be out of the way of the tube, which still continues to move in the direction of the arrow *x'*, with the plate E and the parts thereon. As the plate E moves in the direction of the arrow *x'*, the beveled bottom corner of the dog I strikes against one end bevel of the cam-plate J' on the standard J and thereby the rocking shaft F is slightly turned on its longitudinal axis, and the tube G and that part of the paper tube *d* in the same are swung in the direction toward the shaft L sufficiently to permit the saw to cut into the paper tube at the end of the tube G. As said paper tube *d* is being rotated while moving in the direction of its length its entire periphery is presented to the saw-teeth and an annular cut is made in the tube, whereby a certain length of the tube is cut off. By this time the dog I has arrived at the end of the cam-plate J and the pulley B' has made half a revolution, and by the action of the cam-track on the rollers *e* the plate E is now moved in the inverse direction of the arrow *x'*. The pivoted dog I can now slide over the top edge of the cam-plate J' without acting on the tube G, and the same is held centrally above the longitudinal axis of the plate E by the action of the spring-wire K—that is, clear of the saw. The parts travel in the inverse direction of the arrow *x'*, and the rod Q is also pulled back as the spring W bears on the hook V that projects from the collar U. Thereby the end of the rod Q is brought in the path of the projection B³ of the cam-pulley B', which projection strikes against the projecting end of the rod Q, and thereby the cam-pulley is stopped. As shown in Fig. 10, the yokes D still bear on the pin B⁴ of the cam-pulley; but as said cam-pulley is locked in place the yoke D is also locked and the hub C' of the pulley C now rotates within said yokes. As soon as the end of the tube *d* again strikes against the disk R' the cam-pulley B is again released and the yokes D can again rotate the same. In this way the cutting-machine is started automatically when the proper length of the paper tube projects from the end of the guide-tube G. When the rod Q' moves in the inverse direction of the arrow *x'*, it swings the lever R into vertical position, so that the disk R' will be in the path of the paper tube *d*. The block S' on the rod T and the block Q' on the rod Q can be adjusted any desired distance from the standard J, according to the desired length at which the paper tube *d* is to be cut; but in all cases the said blocks must be adjusted together, so that as long as the rod Q locks the friction-pulley B' in place the lever R will be held in vertical position. As the saw moves at the same speed with

the guide-tube G and said guide-tube G moves at precisely the same speed with the tube *d* being cut off, the tube will be cut off precisely at right angles and each section cut off will have precisely the same length as any other section, providing that the adjustment of the lever R has not been changed, for the reason that the machine is always started when such a length of paper tube has been formed as to extend up to the disk R'.

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

1. The combination with a guide for a tube to be cut off, mechanism for moving said guide in the same direction with the moving tube and at the same speed, a saw moving with said guide, means for tilting the guide toward the saw, a latch locking said mechanism and means in the path of the moving tube for disengaging said locking mechanism, substantially as set forth.

2. The combination with means for guiding a tube, of a saw for cutting the same, means for moving said guide, a latch for locking said means in place, a device for automatically disengaging said latch from the mechanism by the action of the end of the tube to be cut off, and means for tilting the guide toward the saw, substantially as set forth.

3. The combination with a guide for a tube to be cut off, of a cam-pulley for moving said guide in the same direction as the moving tube and at the same speed, a saw moving with the said guide, a rod for locking said cam-pulley, a lever in the path of the tube connected with said locking rod, and means for tilting the guide toward the saw, substantially as set forth.

4. The combination with a guide for a tube to be cut off, of a cam-pulley for moving said guide in the same direction as the moving tube and at the same speed, a saw moving with the said guide, a rod for locking said cam-pulley, a lever in the path of the tube connected with said locking rod, an abutment against which one end of said lever rests, and means for tilting the guide toward the saw, substantially as set forth.

5. The combination with a guide for a tube to be cut off, of a cam-pulley for moving said guide in the same direction as the moving tube and at the same speed, a saw moving with the said guide, a rod for locking said cam-pulley, a lever in the path of the tube adjustably connected with said locking rod, an adjustable abutment against which one end of said lever rests, and means for tilting the guide toward the saw, substantially as set forth.

6. The combination with a guide for a tube to be cut off, of a cam-pulley for moving said guide in the same direction as the moving tube and at the same speed, a saw moving with the said guide, a rod for locking said cam-

pulley, a lever mounted adjustably on said rod in the path of the moving tube, an adjustable abutment against which one end of said lever can rest, and means for tilting the guide toward the saw, substantially as set forth.

7. The combination with a guide for a paper tube to be cut off, of a cam-pulley for moving said guide in the same direction as the moving tube and at the same speed, a saw moving with the said guide, a rod for locking said cam-pulley, a block held adjustably on said rod, a lever pivoted to said block and located in the path of the tube, an abutment against which one end of the lever can rest, and means for tilting the guide toward the saw, substantially as set forth.

8. The combination with a frame, of a sliding plate, means for moving said sliding plate in the direction of its length forward and backward, a guide-tube mounted pivotally on said plate, a cam-track at the side of the plate, a projecting arm connected with the guide-tube, a dog pivoted to said arm and running on the cam-track, a spring acting on said guide-tube to hold the dog on the cam-track, and a rotary saw mounted to move with the sliding plate, substantially as set forth.

9. The combination with a frame, of a plate mounted to reciprocate on the same, lengthwise, a cam pulley for reciprocating said plate, a guide tube for guiding a paper tube, which guide tube is mounted on said plate, a saw for cutting off the paper tube and mounted to move with the same speed as said plate, means for propelling the guide tube toward the saw, a friction pulley mounted adjacent to the cam pulley, means for locking the cam pulleys at times and a mechanism in the path of the moving paper tubes for disengaging said locking mechanism from the cam pulley, substantially as herein shown and described.

10. The combination with a reciprocating plate, of a cam-pulley for reciprocating said plate, a friction-pulley mounted adjacent to the cam-pulley, means for rotating the cam-pulley from the friction-pulley, a rod for locking the cam-pulley in place, means for shifting said rod by the action of the end of the moving paper tube, a guide for said paper tube mounted on the plate, a saw for cutting off the tube, and means for tilting the guide toward the saw, substantially as set forth.

11. The combination with a reciprocating plate, of means for moving the same in the direction of its length, a guide-tube on said plate, a sliding rotating saw-shaft mounted adjacent to the sliding plate, a saw on said shaft, a grooved pulley on the shaft, an arm projecting from the sliding plate into said grooved pulley and means for tilting the guide-tube, substantially as set forth.

12. The combination with a fixed shaft, of a cam-pulley on the same, a pin projecting from the end of the cam-pulley, a driving-pulley mounted loosely on said shaft, yokes

clamped on the hub of said cam-pulley and
bearing against a pin on the end of the cam-
pulley, a reciprocating plate operated from
the cam-pulley, a guide for the paper tube on
5 said reciprocating plate, a saw mounted to
move with the reciprocating plate, and means
for tilting the guide toward the saw, substan-
tially as set forth.

In testimony that I claim the foregoing as
my invention I have signed my name in pres- 10
ence of two subscribing witnesses.

HARMER DENNEY.

Witnesses:

OSCAR F. GUNZ,
CHARLES SCHROEDER.