(No Model.) 2 Sheets—Sheet 1.

D. L. McCORKINDALE.

SLITTER FOR PAPER CUTTING MACHINES.

No. 453,655. Patented June 9, 1891.

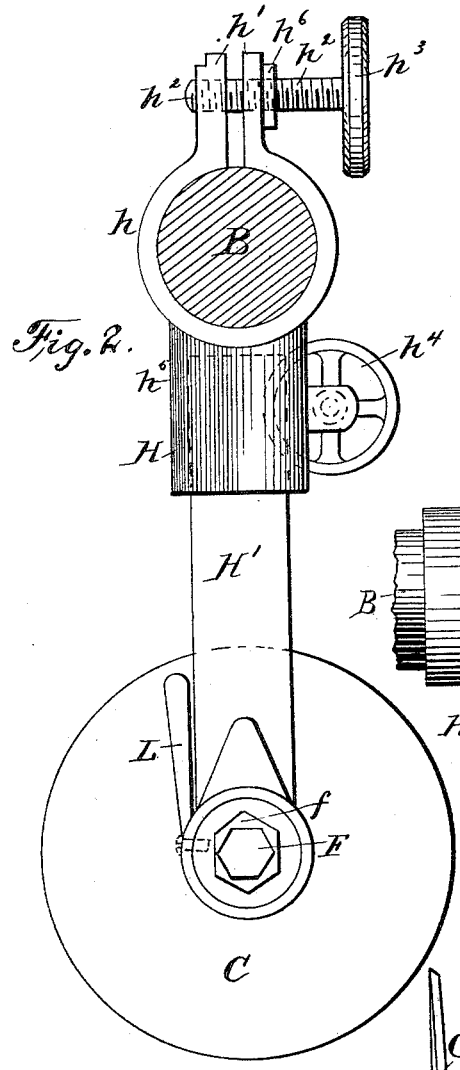

Fig. 2.

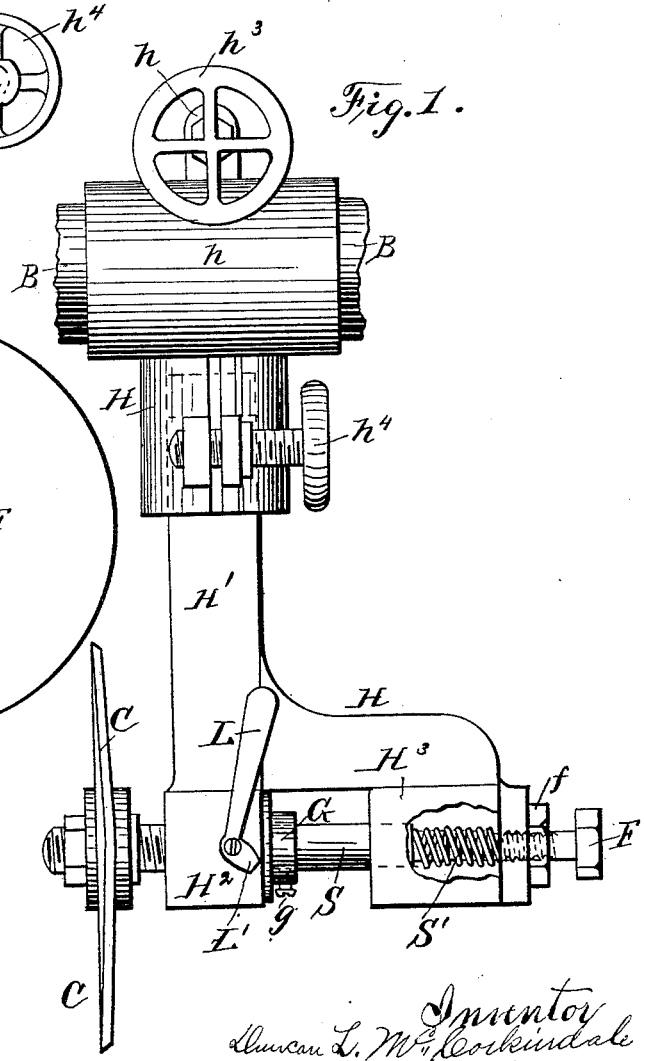

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

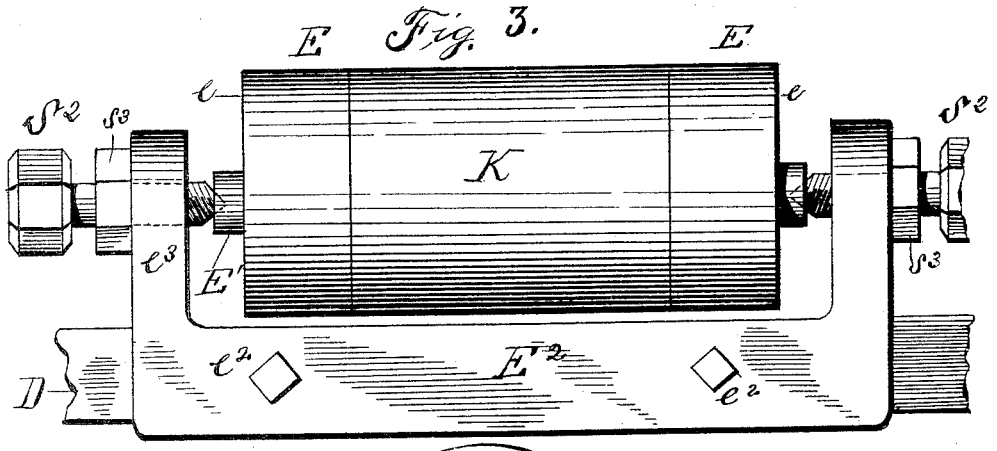


Fig. 4.

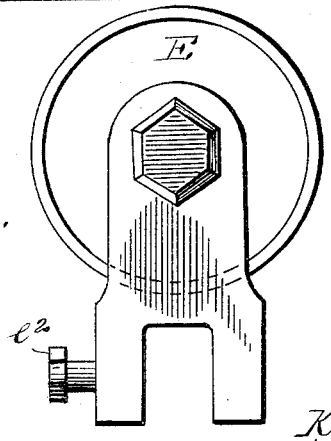
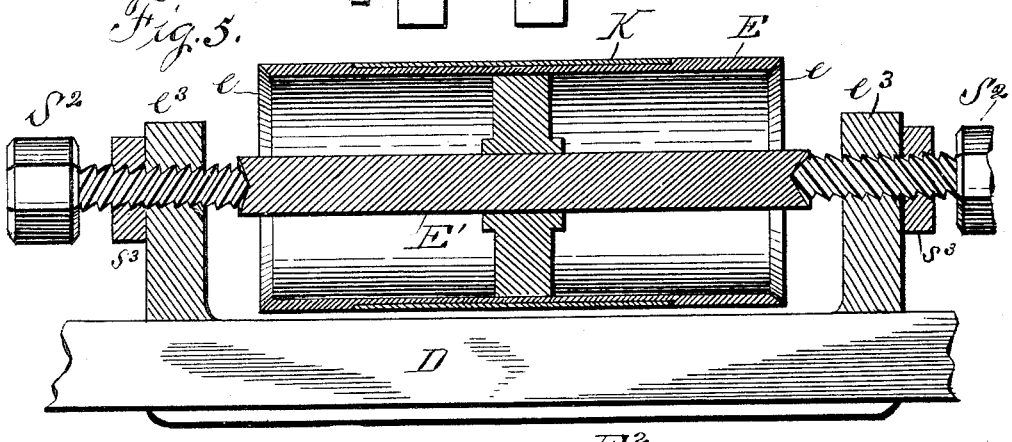


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SLITTER FOR PAPER-CUTTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 453,655, dated June 9, 1891.

Application filed July 28, 1890. Serial No. 360,144. (No model.)

To all whom it may concern:

Be it known that I, DUNCAN L. McCORKINDALE, a citizen of the United States, residing at Childs post-office, in the county of Cecil and State of Maryland, have invented certain new and useful Improvements in Slitters for Paper-Cutting Machines; and I do hereby 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to paper-cutting machines or to cutting attachments for paper-making machines, and has for its object certain improvements in the construction of cutters for the cutting of paper, certain improvements in the means for supporting the upper cutters, and in the means for adjusting the same relatively to the lower cutters, and certain improvements whereby the upper-cutter spindles may be readily removed from their bearings without removing the cutters from said spindles.

The invention consists in structural features and combinations of parts, as will now be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, and Fig. 2 is a right-hand end elevation, of the hanger and discoidal cutter, the supporting-rail being shown in section. Figs. 3 and 4 are front and end elevations of my novel cylindrical cutter, and Fig. 5 is a longitudinal axial section thereof.

In the above-described drawings like letters of reference indicate like parts wherever such may occur in the various figures.

In cutting attachments for paper-making machines or in paper-cutters the rail that supports the upper cutters is generally a slotted rail and rectangular in cross-section, the cutter-hangers being adjusted along the slot of said rail. In order to effect this adjustment, either the nut above the rail or that below is manipulated, and when loosened the hanger is free to swing in the slot to the extent to which such nuts have been moved away from the rail, so that unless the hanger is held perpendicular to the rail while being moved along the same said hanger is apt to bind. This I avoid by the use of a cylindrical rail or shaft B and providing the hanger H with sleeve-bearing h, adapted to fit the said rail. The bearing may be secured to the hanger by means of a set screw or bolt, or said bearing may be a split bearing, provided at the split with flanges h', through which passes a clamping-screw h^2, provided with a hand-wheel h^3, as shown in Fig. 3. In order to compensate for wear of the cutting-edge of the cutters, I provide means whereby said cutters may be adjusted vertically to and from the lower cutters. To this end I construct the hangers H in two parts and form on and at right anges to the sleeve-bearing h a like bearing h^5 for the reception of the hanger rod or bar H′, which may be locked to bearing h^5 by a set-screw; or the said bearing may also be a split bearing provided with a clamping-screw h^4. To prevent accidental rotation of the clamping-screws h^3 h^4, I preferably employ a jam-nut h^6. The hanger-bar H′ is provided with a bearing H^2 for the cutter-spindle S, on which the discoidal cutter C is mounted in the usual way, and said arm has a bracket-bearing H^3 for the rear end of the cutter-spindle, in which is arranged a coiled spring S′, that exerts a constant pressure upon the end of said spindle, the tendency of which pressure is to move the spindle outwardly. The pressure exerted by the spring S′ can be regulated by means of a bolt or screw F, that works in the threaded bore at the inner end of the bracket-bearing, and when adjusted the said bolt is locked against accidental rotation by a lock or jam nut f.

As above stated, the tendency of the spring S′ is to move the cutter-spindle S out of its bearings, and consequently the cutter C away from the lower cutter.

The adjustment of the upper cutter relatively to the lower cutter is effected by means of a cam or eccentric lever L, the cam or eccentric L′ of which bears upon a collar G, secured to spindle S by means of a set-screw or bolt g, so that when it is desired to move the cutter C away from the lower cutter E it is only necessary to turn the lever L so as to move its cam L′ out of contact with the collar G, when the spring S′ will at once throw the spindle S forward until the collar abuts

against the bearing H^2. On the other hand, when it becomes necessary from any cause to remove the cutter C and its spindle this may be done by simply loosening the screw *g*, when the said spindle S may be readily drawn out of its bearings. This construction has great advantages in that it avoids the necessity of removing the cutter from its spindle when it becomes necessary to sharpen the same and the consequent tedious operation of centering and securing the said cutter again to its spindle.

Discoidal cutters supported as described may be used with like lower cutters mounted and adapted for adjustment on a lower rail or shaft in any well-known manner. I prefer, however, to employ in conjunction with the upper discoidal cutters my improved cylindrical cutter E, which is revolved by the paper being cut or performs the function of a feed-roll. These cutters consist of a cylinder, the cutting-edge *e* being formed at each end of the cylinder, and will of course revolve in a plane at right angles to that of the upper discoidal cutter. I thus obtain a shear cut, and consequently a cut without ragged edges. Furthermore, the cutting-edges of both cutters are not as liable to speedy wear as when the cutting-edges revolve in the same plane, and when the cutting-edge of the cylindrical cutter becomes dull or worn the cutter can be reversed.

The cutter E has an integral web, in which is formed a bearing for a spindle E′ in the ends of which are formed conical recesses or sockets for the cone-bearing screws S^2, that work in screw-threaded holes in standards e^3, projecting from a carriage E^2, that is adjustably secured to the lower cutter-rail D by means of the set-screws e^2, the said carriage being **U**-shaped in section and adapted to straddle said rail D.

Instead of forming conical sockets in the ends of spindle E′, said spindle may have conical ends, and the socket-bearings may be formed in the ends of the screws S^2, as will be readily understood. The screws S^2 are locked against rotation when adjusted by means of lock or jam nuts s^3.

I am aware that a cylindrical rail for supporting the bearings for the upper cutters has heretofore been used, so that the said bearings may be readily adjusted thereon or swung out of the way of the lower cutters, and I do not desire to claim this broadly.

In some constructions of paper-cutting machines or attachments one of the discoidal cutters is held in frictional contact with the other by means of a spring. This, however, has serious disadvantages. If the spring exerts sufficient power upon the cutter or its support to prevent endwise motion of the cutter on its spindle, which would otherwise result as the paper passes between them and produce a jagged irregular cut, there will be an excessive and very speedy wear of the cutting-edges. On the other hand, the spring-actuated cutter will act as a brake for the other cutter and retard its motion, so that the two cutters will not revolve at the same speed. This I effectually avoid by the devices hereinabove described in reference to Figs. 1 and 2.

In order to facilitate and promote the rotation of the lower cylindrical cutter E, the said cutter may have a cylindrical recess between the cutting-edges—that is to say, the diameter of a portion of the cylinder intermediate of its cutting-edges may be or is preferably sufficiently reduced to apply thereto a friction-cylinder, which may be a band of rubber or felt or equivalent material K, Fig. 5, to increase the friction between the periphery of the cylindrical cutter and the paper traveling over it.

Any usual or preferred means may be employed for imparting motion to the web of paper—as, for instance, the usual felt roll that conducts the paper through the driers—suitable guide-rolls being provided; but as these devices form no part of this invention and as they are well known it is not necessary to the full understanding of my invention to describe the same in detail.

Having now described my invention, what I claim is—

1. In a paper-cutting machine, the hanger H, composed of integral tubular split bearings *h* and h^5 at right angles to each other, in combination with the hanger-rod H′, and clamping-screws for clamping the hanger to the rail and the rod H′ to the said hanger, substantially as and for the purpose set forth.

2. In a paper-cutting machine, a hanger for the upper cutter, a spindle mounted loosely in a bearing on the hanger, a cutter and collar secured to the spindle on opposite sides of its bearing, respectively, a spring exerting its power to move the spindle and its collar toward the spindle-bearing, and a cam or eccentric lever adapted to engage the collar on the spindle and move the latter against the stress of its spring, substantially as and for the purposes specified.

3. In a paper-cutting machine, a hanger for the upper cutter, a cutter-spindle loosely mounted in a bearing on the hanger, a cutter at one end of the spindle and on one side of its bearing, a collar adjustable on said spindle on the opposite side of the bearing, a spring adjustable as to tension and exerting its power to move the spindle and collar toward the bearing, and a cam or eccentric lever fulcrumed on the bearing and adapted to engage the collar and move the spindle against the stress of the spring, substantially as and for the purposes specified.

4. In a paper-cutting machine, a cutter consisting of a cylinder provided with a cutting-edge at each end, and a peripheral recess intermediate of said edges, in combination with a non-metallic friction-surface arranged within said peripheral recess, substantially as and for the purpose set forth.

5. In a paper-cutting machine, the supporting-rail D, the carriage E^2, provided with screw-threaded bearings, the cone-screws S^2, the cylinder-cutter E and its shaft E′, having conical sockets in its ends for the reception of the cones of the screws, in combination with a discoidal cutter adjustable horizontally and vertically relatively to the cutter E, substantially as and for the purposes set forth.

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

DUNCAN L. McCORKINDALE.

Witnesses:

STUART SMITH,

ANDREW D. DEAN.