(No Model.) 2 Sheets—Sheet 1.

H. H. CUMMINGS.

CUTTING MACHINE.

No. 346,093. Patented July 27, 1886.

FIG. 3.

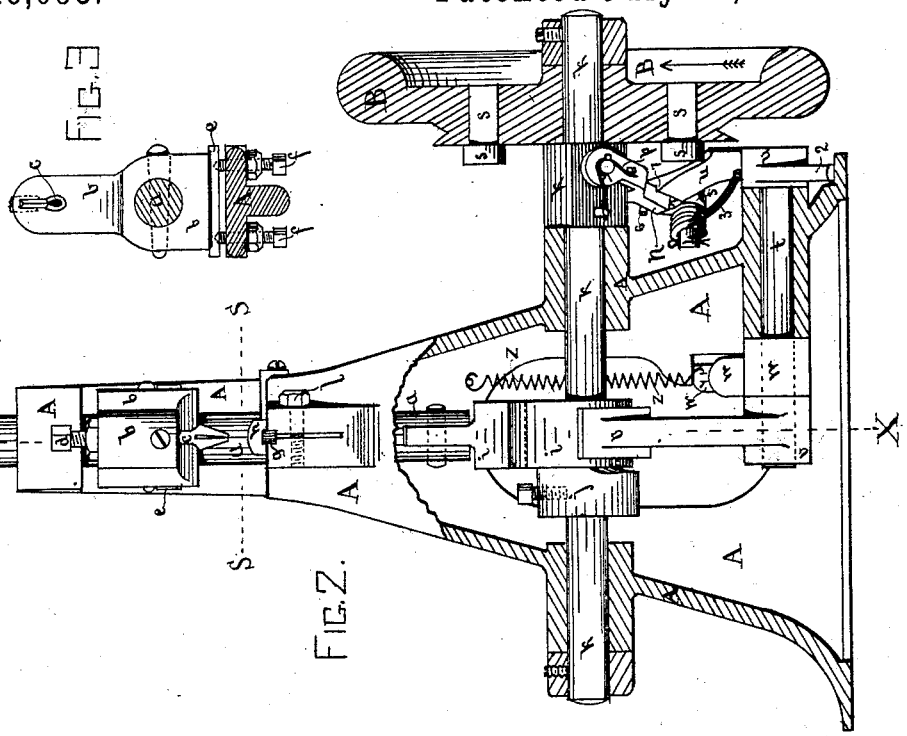

FIG. 2.

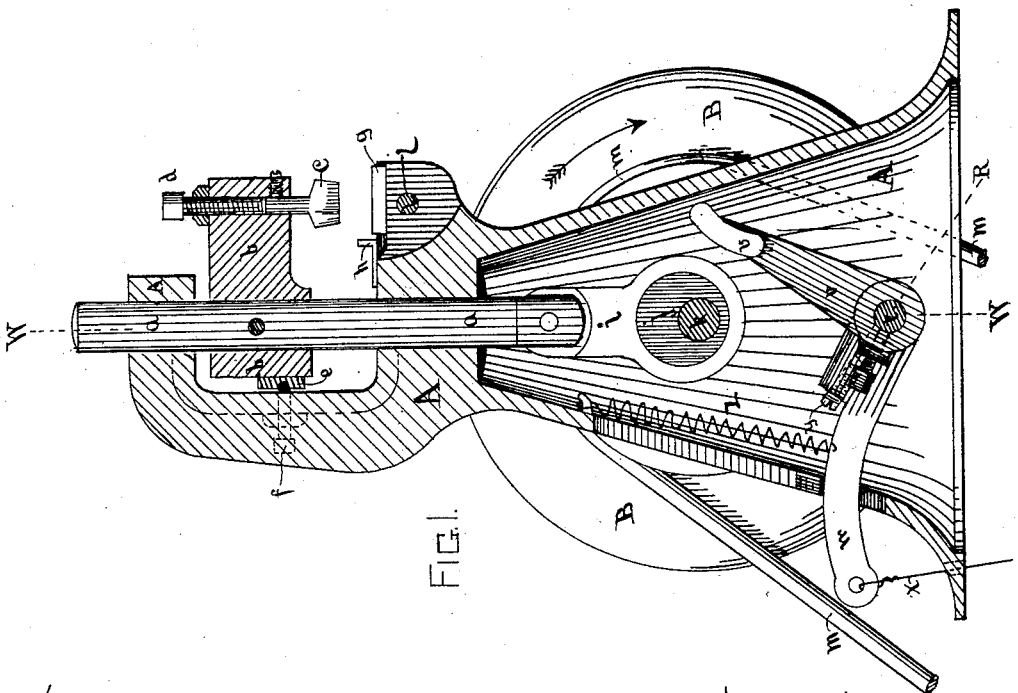

FIG. 1.

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(No Model.) 2 Sheets—Sheet 2.

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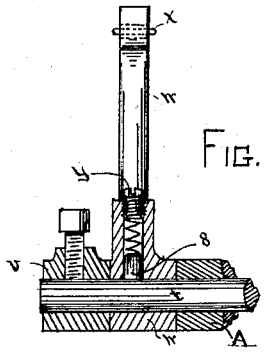

FIG. 6

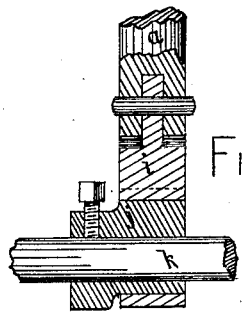

FIG. 5

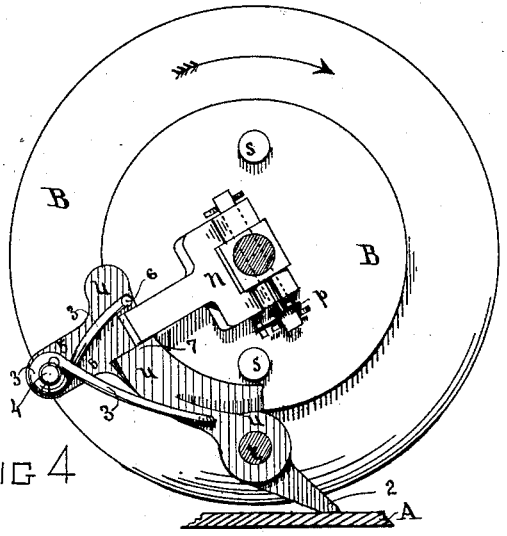

FIG 4

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UNITED STATES PATENT OFFICE.

HENRY H. CUMMINGS, OF MALDEN, MASSACHUSETTS.

CUTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 346,093, dated July 27, 1886.

Application filed September 17, 1883. Renewed December 12, 1885. Serial No. 185,521. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. CUMMINGS, of Malden, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Cutting-Machine, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

This invention relates to that class of machines, which are employed to cut the button-holes in light classes of shoes, lace-boots, and clothing, preparatory to stitching such button-holes and other light work; and the invention consists in the construction and combination of the divers devices embodied therein, as will, in connection with the accompanying drawings, be hereinafter more particularly and fully set forth and claimed.

In the accompanying drawings, Figure 1 is a vertical axial section of my machine, taken as on line X X, Fig. 2, the cutter-rod and eccentric-strap being shown in elevation. Fig. 2 is a sectional elevation, the section being taken through the lower portion of the machine as on line W W, Fig. 1, and the upper part of the machine being shown in elevation. Fig. 3 is a detached sectional inverted or under side plan view, the section being taken as on line S S, Fig. 2, and the plan view being an under side view of that part of the machine which is above said line. Fig. 4 is a detached elevation of the balance band-wheel and the clutch devices, the arbor of said wheel being shown in cross-section, said parts being viewed as from the left in Fig. 2. Fig. 5 is a detached vertical section taken through the eccentric-strap and the lower part of the cutter-rod, a part of the wheel-arbor being shown in elevation. Fig. 6 is a detached section taken as on line R, Fig. 1, through the arms of the rock-shaft, which latter is shown in detached elevation.

In said views, A represents the stand or frame, in which the operative parts are mounted. In the upper part of the frame a shaft, *a*, is arranged to slide in bearings, and an arm, *b*, is rigidly secured on said shaft. In the front end of this arm the cutter *c* is secured, it being held from rotation by a set-screw shown in Fig. 1, and it is vertically adjusted by the locking-screw *d*, which is threaded in the arm, as shown. The rear end of arm *b* is formed in plane, and is held from lateral vibration by a gib, *e*, which bears against said plane, and is itself supported and adjusted by screws *f* threaded in the frame. A cutting-block, *g*, is held in a seat in a projection of the frame, and is secured therein by the pinch-screw *l* in a well-known manner, as shown in Figs. 1 and 2. Vertical movement is imparted to shaft *a* by means of the eccentric-strap *i*, and the eccentric *j*, the strap being pivoted to the shaft, as shown in Figs. 1, 2, or in any equivalent manner, and the eccentric being secured on the driving-wheel arbor *k*, as shown in Figs. 1, 2, 5. The balance or driving band-wheel B is loosely mounted on arbor *k*, and is driven in the direction indicated by the arrows by band *m*.

For the purpose of imparting the continuous rotary motion of wheel B intermittently to arbor *k* a forked arm, *n*, is pivotally mounted on arbor *k* adjacent to wheel B, and is constantly held against the wheel by a coiled spring, *p*, whose respective arms engage studs in said arm *n* and the arbor, as shown in Figs. 2, 4, and when so moved against the wheel, the arm is engaged by one of the studs *s* projecting from the wheel, and is thereby caused to rotate the arbor.

For the purpose of engaging and disengaging lever *n* with and from studs *s* a rock-shaft, *t*, is journaled in the base of the frame, and upon it is secured an inclined arm, *u*, so arranged that, whether raised or lowered in the manner to be described, that portion of it nearest to said shaft will engage arm *n* and move it laterally so as to disengage it from studs *s*, and so stop the machine, and when the outer end of arm *u* is raised in the manner to be described, it will arrest and hold arm *n*, when disengaged from the wheel, until it is again liberated, as will be described. In order to actuate said shaft *t*, two arms, *v w*, are mounted on it, arm *v* being rigidly secured to the shaft, and so arranged thereon that when the extreme throw of eccentric *j* is between arbor *k* and said arm, the latter will be thereby so moved as to raise the outer end of oblique arm *u* into the path of forked arm *n*, and so lock it after it has been disengaged from the driving-wheel

by its engagement with the lower end of arm *u*, as described, the wheel then turning idly on the arbor.

For the purpose of disengaging oblique arm *u* from arm *n*, the arm *u*, which by its wire *x* is attached to a foot-operated treadle, is frictionally engaged with shaft *t*, by means of a set-screw, *y*, by which a coiled spring and shaft-engaging plug S are adjusted to produce the required friction upon the shaft, so that when said arm is depressed by the treadle it will move the shaft with it, (arm *v* being at the time free from strap *i*,) thereby drawing oblique arm *u* down and away from forked arm *n*, which is then, by its spring *p*, moved into the path of studs *s;* but when arm *v* is forced back by the eccentric-strap *i*, as described, the shaft *t* will move in the eye of arm *w*, by reason of such frictional contact only, and when the treadle is released, arm *w* will be raised by the action of helical spring *z*, arranged as shown in Figs. 1, 2, thereby bringing arm *w* into the same relation to arms *v* and *u* as before the action of the eccentric-strap on arm *v*, as described. A short arm, 2, extends from the eye of lever *u* to check the upward movement of said lever. It will thus be seen that the treadle may be depressed and so held for any length of time, wheel B revolving the while without producing more than one revolution of arbor *k*, for the reason that the eccentric acts on arm *v*, thereby raising inclined arm *u*, which holds forked arm *n* free from the wheel, and hence, when cutter *c* has been once brought in contact with the leather to cut a hole, it remains inactive until the treadle has been released to allow it to be raised by spring *z*, as stated, and has then been again depressed, when the cutting action is repeated.

In order to cushion the shock resulting from the sudden stopping of arbor *k* and arm *n*, I arrange a coiled spring, 3, on a stud, 4, secured in a projection, 5, of lever *u*, the long arm of said spring being fastened in said lever near shaft *t*, while a stud or angle, 6, projecting from the short arm of said spring is in the path of lever *n*, and by a yielding resistance arrests the same, and to prevent a rebound of said lever *n* by the action of its arresting-stud 6, a shoulder, 7, is formed in oblique lever *u* at such distance from said stud that lever *n* is held between them.

I claim as my invention—

1. In a cutting-machine, the combination of the vertically-reciprocating shaft *a*, the cutter-carrying arm *b*, formed with a broad plane-like rear end, and gib *e*, arranged to be adjusted against said arm and hold the same from lateral vibration, substantially as specified.

2. In a cutting-machine, the combination of the cutter-carrying shaft *a*, eccentric-strap *i*, thereto pivoted, eccentric *j*, arbor *k*, and driving-wheel B, loosely mounted thereon, lever *n*, pivoted on said arbor and arranged to be automatically thrown into contact with said wheel when liberated, a vertically-vibrating oblique or cam-like lever, *u*, to engage lever *n* and liberate it from said wheel, and a treadle mechanism by which to disengage said levers, substantially as specified.

3. In a cutting-machine, the combination of wheel B, its arbor *k*, lever *n*, pivoted on said arbor, and oblique lever *u*, arranged at its lower end in the path of the outer end of lever *n* to engage and disconnect the same from the wheel, and with its outer end arranged to be raised into and depressed below the path of said lever *n*, substantially as specified.

4. In a cutting-machine, the combination of shaft *a*, cutter-arm *b*, strap *i*, eccentric *j*, arbor *k*, driving-wheel B, clutch-lever *n* with its engaging-spring *p*, oblique disconnecting-lever *u*, secured on rock-shaft *t*, rigid arm *v*, secured on said rock-shaft and arranged to be actuated by said eccentric-strap, and arm *w*, frictionally engaging said rock-shaft and connected with a treadle mechanism, all substantially as specified.

5. In a cutting-machine, and in combination with the wheel and arbor engaging devices, the rock-shaft *t*, its rigid arm arranged to be actuated by eccentric-strap *i*, the arm *w*, arranged to frictionally engage said shaft, and a treadle arranged to engage and actuate said arm, whereby the action of the treadle through arm *w* and the shaft will disengage lever *u* from lever *n*, and the action of strap *i* on arm *v* will without releasing the treadle raise said lever *u* into the path of lever *n*, substantially as specified.

6. In a cutting-machine, the combination of the reciprocating cutting devices, the driving band-wheel, its arbor, and a clutch mechanism by which the driving-wheel and its arbor are interlocked and disconnected, a treadle mechanism connected with the arm of a rock-shaft and arranged to release the clutch mechanism and permit it to engage the driving-wheel, and an arm secured on said rock-shaft and arranged to disengage through devices, substantially as described, the clutch mechanism that interlocks the driving-wheel and its arbor independently of said treadle mechanism, substantially as specified.

7. In a cutting-machine, the combination of arbor *k*, its driving-wheel B, and clutch-lever *n*, arranged to engage and be driven by said wheel, eccentric *j*, secured on said shaft, its strap *i* and shaft *a*, therewith connected and provided with cutter-carrying arm *b*, a rock-shaft, *t*, having a rigid arm, *v*, arranged to be actuated by strap *i*, and arm *w*, arranged to connect with a treadle mechanism and frictionally engage said rock-shaft to thereby actuate the same, and a cam-like arm, *u*, also arranged on said rock-shaft to release clutch-lever *n* from wheel B when raised into the path of said clutch, substantially as specified.

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Witnesses:
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A. O. OURE.