

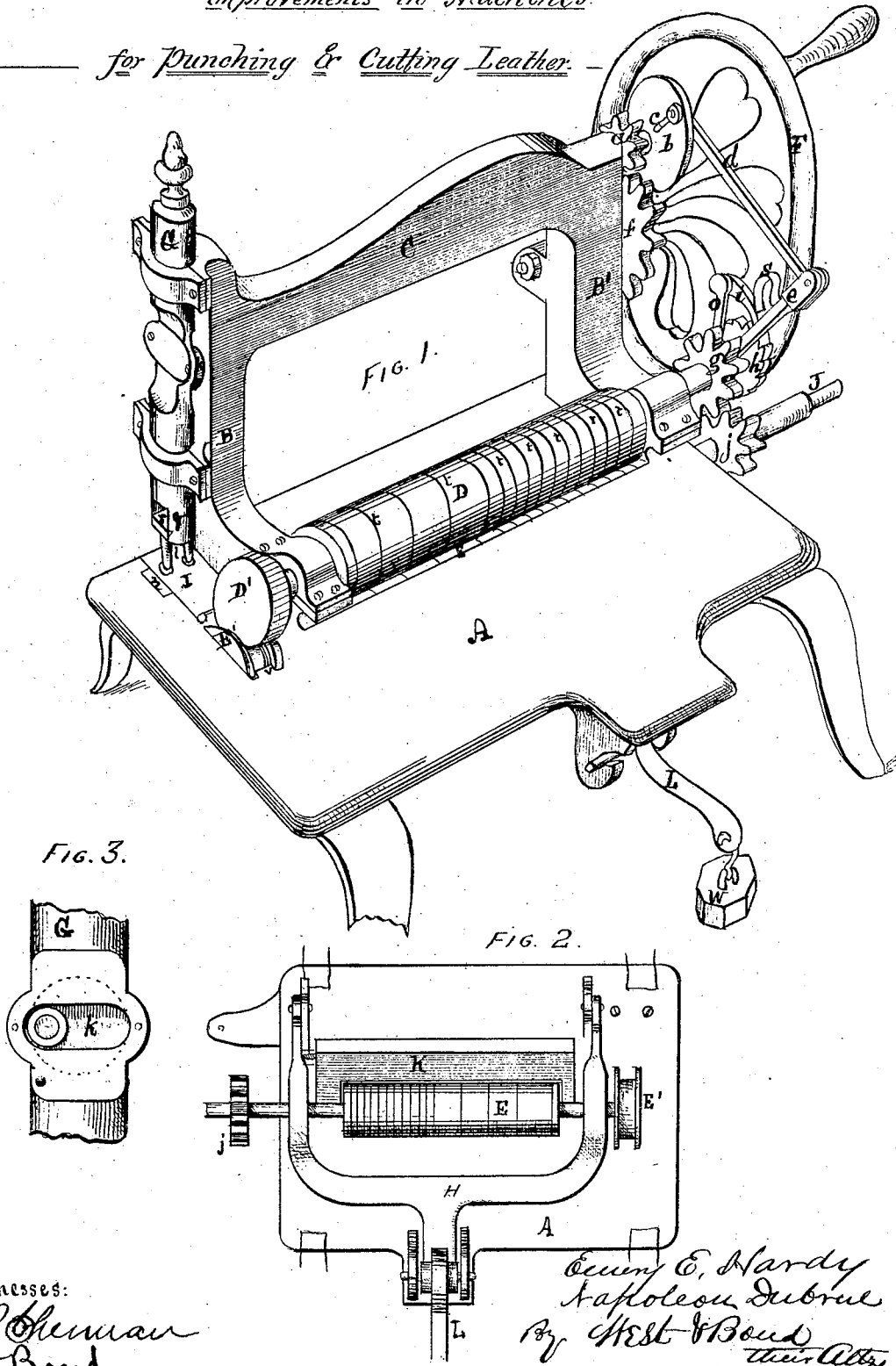
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PATENTED FEB 7 1871

*improvements in Machines*

*for Punching & Cutting Leather.*



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E. E. Hardy, & Napoleon Dubrul,

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FIG. 9.

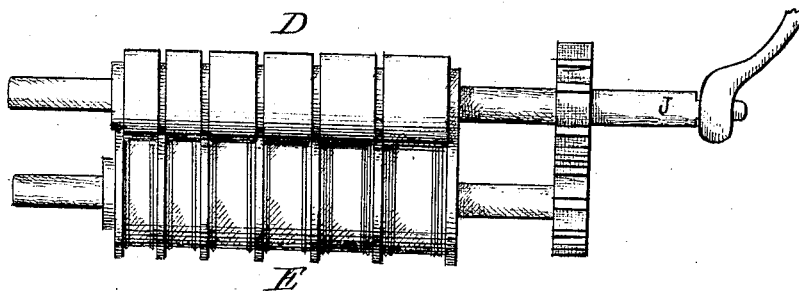


FIG. 7.

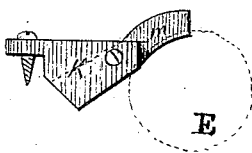


FIG. 6.

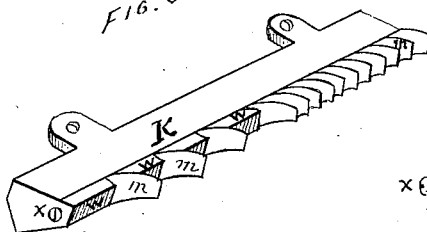


FIG. 8.

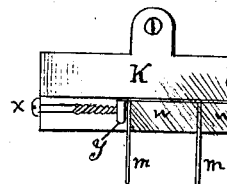


FIG. 5.

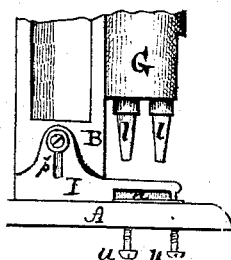
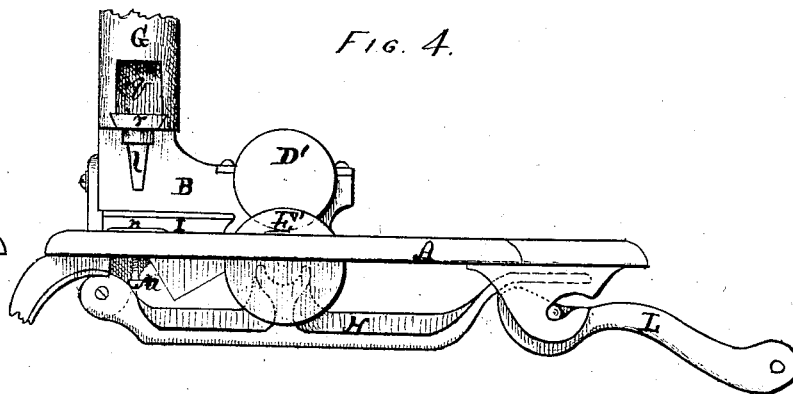


FIG. 4.



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# United States Patent Office.

EMERY E. HARDY AND NAPOLEON DUBRUL, OF JOLIET, ILLINOIS.

Letters Patent No. 111,533, dated February 7, 1871.

## IMPROVEMENT IN LEATHER-PUNCHING AND CUTTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

EMERY E. HARDY and NAPOLEON DUBRUL, of Joliet, in the county of Will and State of Illinois, have invented a certain new and useful Machine for Punching and Cutting Leather, of which the following is a full description, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective.

Figure 2,

Figure 3,

Figure 4, an end view.

Figure 5, a rear view of a part of the machine.

Figures 6 7 8, show the knives, the frame in which they are placed, and the mode of securing them in place.

Figure 9 shows a set of creasing-rollers.

The object of our invention is to construct a machine by the use of which holes can be rapidly punched in leather, and the leather be cut into strips of various widths, and which, by removing one set of rollers and inserting another, can be used as a creasing-machine.

Our machine is primarily designed to be used in manufacturing leather fly-nets, for the purposes of cutting the straps and strings, and punching the holes in the straps, but it is not limited to these uses.

In the drawing—

A represents the bed-plate, to which are firmly connected two supports B B', the same being connected at the top by a cross-bar, C, which is made hollow or open so as to admit a shaft for operating the eccentrics;

D and E guide-rollers, provided with grooves in which the knives *m* of the frame K are placed at the back;

D' and E' guide and feed-rollers, by means of which the strips of leather are fed to the punches;

F, balance and crank-wheel;

G, reciprocating-shaft;

H, adjusting-frames for supporting the guide and feed-rollers E and E';

I, a perforated adjustable plate for clearing the punches;

J, an extension of the journal of the roller E, so that by the application of a separate crank, the slitting portion of the machine is capable of a separate and independent movement;

K, a frame in which the slitting-knives are secured;

L, a weighted lever for making the rollers D E self-adjusting; and

W, a weight.

*a* represents a spur-wheel near the outer end of the shaft, running through the cross-bar C;

*b*, a crank-wheel into which the wrist-pin of the pitman is inserted in a block sliding or adjusted in a slot, *c*, in said wheel or crank;

*d*, a pitman;

*e*, a vibrating arm pivoted on the journal of the roller D. This arm has a short branch, *o*, to the upper end of which a dog, *i*, is pivoted;

*s*, a spring to hold the dog down and insure its engagement with the ratchet-wheel *h*;

*f* is a spur-wheel on the crank or main shaft *g*; and *j*, spur-wheels on the outer ends of the rollers D and E.

*m*, knives or blades for slitting leather into narrow strips.

*n*, an adjustable bed-plate to receive the punches when in operation.

*p*, slot with thumb-screw for adjusting the height of the clearing-plate I.

*q*, opening at the lower end of the reciprocating-shaft for the passage of chips.

*r*, connecting-block for the punches.

The machine is made of iron or of other suitable material.

The periphery of the short roller D' is milled, and the ends of E' are provided with flanges so as to insure a proper direction and feed of the strap which is passing to the punches.

The punches are permanently attached to the head-block *r*, and when it is desired to change them the head-block is drawn out and another is inserted. In this way the number or sizes may be easily changed so as to adapt the machine to any kind of work requiring one or more holes punched at intervals. The punches are hollow, and the chips pass through the head-block *r* and out at the opening *q*.

The shaft G is made to operate by means of a pin attached to the inner end of the cross-shaft operating in the horizontal slot or opening *k*, fig. 3.

The punches pass through the plate I, which is made adjustable to any thickness of leather, and it prevents the leather or other substance from rising when the punches are withdrawn, and as it is difficult to make or keep the punches of an exact length when two or more are used, we make the bed-plate *n* adjustable, so that either end may be raised or lowered separately by means of the screws *u*, and it may be raised and lowered as a whole to accommodate different lengths of punches, and to regulate the exact distance for a proper cut. The gearing is arranged so as to regulate the distance between the holes or series of holes in the strap, and also so as to leave the strap at rest while the punches pass through and are withdrawn.

The distance is regulated by means of the slot *c* in the wheel *b*. When the wrist-pin is at the inner end of the slot, the dog *i* will engage each notch or tooth of the ratchet-wheel *h*, and when at the outer end, *i* will pass over and only engage every third one, and will pass further if the wheel *b* is enlarged. It can also be set at any intermediate point.

The wheel *b* is so arranged with the pin in slot *k*, that the punches pass through the leather while the dog *i* is being withdrawn for a new operation, and in order to prevent any reaction of the feed-rollers, we usually attach a spring-dog at the back of the wheel *h*, to hold it when it is left by the dog *i*.

When, cutting the strips and bands, the punch is not in operation, it is disconnected by turning off the spring *s* and throwing back the dog *i*, and if an additional dog is used, that should also be disconnected. A crank is then applied at *J*, and a continuous motion given to the feed-rollers *D* and *E*. These rollers force the leather onto the slitting-knives or blades *m*, which are arranged to give the desired width of the strips of leather.

We also provide a set of creasing-rollers, (shown at fig. 9,) to take the place of *D* and *E*, so that creasing can be done in the same machine.

The feed-roller *E'* is provided with creasers *v*, so that when the straps are of a regular width, the creasing is done at the same time as the punching.

The under frame *H* is hinged, as shown at fig. 4, at one side, and is supported by the lever *L*. The outer end of this lever is provided with a sufficient weight to make the roller *E* press against *D* hard enough to do the required work. The journal-bearings *o* of *E* are in this frame *H*.

The frame *K* is made of iron, and has a long opening for the knives *m*. The knives or blades are spaced by means of intermediate blocks *w*, the same in width as the space between the grooves *t* in the feed-rollers, and they with the blades are held in place by means of the screw *z*, which passes in at one end and presses against a washer, *y*, thereby spacing the blades correctly and holding them securely in place, but so that the blades can be easily taken out for sharpening and for other purposes.

The blades passing in between the rollers in the

grooves *t* are supported above and below, in addition to the support of the frame *K*. When creasing-rollers only are used, this frame is taken out.

Having thus fully described our improved machine,

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

1. The combination of the feed-rollers *D'* and *E'*, operating at intervals, with the reciprocating-shaft or arm *G* and hollow punch *l*, substantially as specified.

2. The combination of the adjustable bed-plate *n*, with the adjustable stripping-plate *I* and reciprocating-punches *l*, substantially as described.

3. The bed-plate *n* supported by the screws *u* or their equivalents, capable of being adjusted independently of each other, to adapt the bed-plate to the varying lengths of the different punches, substantially as described.

4. The combination of the intermittently-moving feed-rollers *D'* and *E'*, with the reciprocating hollow punch *l*, stripping-plate *I* and bed-plate *n*, substantially as described.

5. The combination of the grooved rollers *D* and *E*, with the knives *m*, secured in the frame *K*, one of said rollers being mounted in the yielding frame *H*, to allow it to adapt itself to the different thicknesses of leather and bear with uniform pressure thereon, substantially as set forth.

6. The arrangement of the punching devices and the slitting devices, with their operating mechanism upon the same frame, in such relation to each other that both operations of punching and slitting may be performed simultaneously, substantially as set forth.

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