C. H. HILL & A. W. PROCTOR.

Machines for Grinding Knives.

No. 158,172. Patented Dec. 29, 1874.

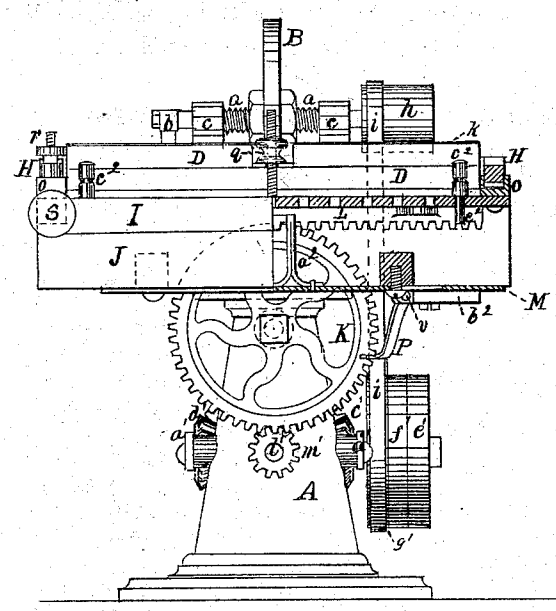

Fig. 2.

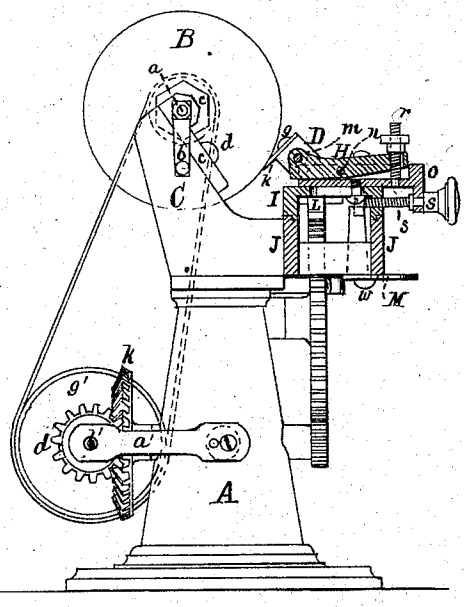

Fig. 3.

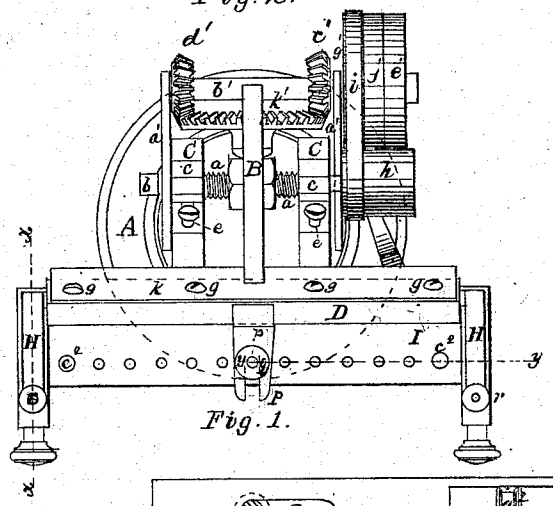

Fig. 1.

Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES H. HILL AND AMOS W. PROCTOR, OF BILLERICA, ASSIGNORS TO UNION STONE COMPANY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR GRINDING KNIVES.

Specification forming part of Letters Patent No. **158,172**, dated December 29, 1874; application filed August 28, 1874.

To all whom it may concern:

Be it known that we, CHARLES H. HILL and AMOS W. PROCTOR, of Billerica, in the State of Massachusetts, have invented certain Improvements in Machines for Grinding Knives, of which the following is a specification:

The invention consists in a device for adjusting the bearings of the emery-wheel, and in a device for presenting the knife to the wheel straight, and in a position to receive any required bevel.

In the drawings, Figure 1 is a plan of a machine embodying our invention. Fig. 2 is a front elevation of the same, a part, taken on the line *y y* of Fig. 1, being in section. Fig. 3 is a side elevation, a part, taken on the line *x x* of Fig. 1, being in section. Fig. 4 is a view in detail of parts of the machine used for shifting the motion of the carriage.

A is the standard or pedestal of the machine. B is the emery-wheel fixed upon the main shaft *a*, which is revolved by a crank, *b*, or by power. The shaft *a* has bearings in two blocks, *c c*, and these blocks have in them long slots *e e*, through which pass set-screws *d d* to secure the blocks to the inclined faces of two brackets, C C, upon the standard. This use of inclined faces permits the bearings of the wheel, as the wheel wears away, to be lowered and moved in toward the knife at one operation. D is the knife-bar, being shown in the drawings with a knife, *k*, secured to it by set-screws *g* passing through slots in the blade. The knife-bar D has at each end a fixed pin, *m*, upon which it rocks, these pins having bearings in two levers, H H, which hang upon pins *n n* having bearings in shoulders of slides *o o*, attached to a carriage, I, hereinafter to be described. The center of gravity of the bar D is such that the bar tips toward the wheel. It is held up in the required position, to determine the bevel, by a forked lever, *p*, and set-screw *q*, the latter working through the fork of the lever into the carriage. In like manner the arms or levers H H swing forward on their pivots *n n*, and are lifted and controlled by set-screws *r r*. Each arm is independent of the other. The slides *o o* are also independent of each other, and each is governed by a set-screw, *s*.

If, after determining the position of the knife-bar for the proper bevel, it is found that the knife is not presented to the wheel straight, it may be straightened without being taken from the bar by tipping more or less one or both of the levers H H, the slides *o o* being also made use of to determine the position of the pivot upon which the levers hang. Placing the pivots of the levers between the set-screws and the work performed gives an elasticity to the parts which is essential in knife-grinding machines.

I is the carriage to which the parts last mentioned belong, and by the movements of which forward and back the knife in grinding is presented throughout its length to the wheel. The manner in which the carriage is moved for this purpose will now be described. It is supported and travels upon ways J J, secured to brackets C C, and underneath has a rack, L. a^1 a^1 are two brackets attached to the pedestal, as shown, and furnishing bearings for a shaft, b^1, upon which are two bevel-gears, c^1 d', the bevel-gear c^1 running loose upon the shaft b^1, while the bevel-gear d' is fixed upon and revolves with the shaft. At one end of the shaft b^1 are three large pulleys, e' f' g', the pulley e' being fast, f' being an ordinary loose pulley, and g' being a loose pulley, but having its hub rigidly connected with the hub of the bevel-gear c^1. *h* is a pulley upon the main shaft. It is connected with one of the pulleys e', f', or g', as the case may be, by the belt *i*. k' is a bevel-gear made fast to the shaft l', passing through and having bearings in the standard. It carries at its other end a small pinion, m', taking into the large pinion K, operating the rack L, as shown. The bevel-gear k' meshes with the bevel-gears c^1 and d'.

It is obvious that when the belt *i* connects the pulley h', in motion upon the main shaft, with the fast pulley e', the shaft b^1 is revolved, and with it the bevel-gear d', turning the bevel-gear k' in one direction, and that when the belt is shifted to the pulley g', loose upon the shaft b^1, the bevel-gear c^1, also loose upon the shaft b^1, but fast to the pulley g', will turn the bevel-gear k' in the opposite direction; and it is clear that when the bevel-gear k' is turned in one direction the carriage will go to the right, and when in the other to the left.

The motion of the carriage is reversed as follows: P is the belt-guide, the belt *i* passing through a slot, *t*. The belt-guide is pivoted at *u* to a cross-bar between the two ways J J, and has two short arms in which are two adjustable pins, *v v*, as shown. M is a sliding bar secured to one of the ways J by two set-screws, *w w*, two slots, *z z*, in the bar permitting it to have a motion to the right or left for the length of the slots. a^2 is an arm projecting upward from the sliding bar M, and b^2 is a cam projecting inwardly from the sliding bar, and shaped as shown, so that as the bar is moved one way or the other the cam strikes one of the adjustable pins *v v* and swings the belt-guide P and holds it locked until designedly released. The arms in which the pins *v v* are inserted may be so shaped as not to require pins. In the carriage is a series of holes, (shown in plan in Fig. 1 and in section in Fig. 2,) and c^2 c^2 are two pins which are dropped into these holes, and which are long enough to strike the arm a^2 as the carriage passes over the arm. The carriage moving, say, from left to right, one of the pins c^2 strikes the arm a^2 and carries with it the bar M a distance equal to the length of the slots *z z*, and this causes the cam b^2 to swing the belt-guide P, thereby shifting the belt *i* from the pulley *e'* to *g'*, and, as before described, reversing the motion of the carriage. The movement of the carriage is now to the left until the other pin c^2 strikes the arm a^2, when the motion is reversed, as before.

The sliding bar M is shown with a handle by which it may be moved without the aid of the pins c^2 c^2.

The belt-shifting device hereinbefore described is not made the subject of a claim in this application, as we are about to file a separate application for a patent for that portion of the invention.

We claim—

1. The blocks *c c*, furnishing the bearings for the emery-wheel, when supported upon inclined planes, substantially as described, to make the bearings adjustable.

2. The combination of the knife-bar D, levers H H, and slides *o o*, each governed by its respective set-screw, and the bar and levers being pivoted, substantially as described, for the purpose specified.

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Witnesses:
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