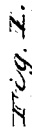
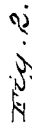


## Edge-Tool Grinder.

*Patented Dec. 18, 1847.*



# UNITED STATES PATENT OFFICE.

WILLIAM HOVEY, OF WORCESTER, MASSACHUSETTS.

## MACHINERY FOR GRINDING KNIVES WHICH HAVE WARPED SURFACES.

Specification of Letters Patent No. 5,398, dated December 18, 1847.

*To all whom it may concern:*

Be it known that I, WILLIAM HOVEY, of the town and county of Worcester and State of Massachusetts, have invented a new and  
5 useful machine for grinding and finishing the edges of knives or blades, such as are used on what are called "cylinder cutters or shears," without removing them from the stock or cylinder where they belong, and  
10 that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the manner of making, constructing, and using the same, reference  
15 being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective representation of the machine, and Fig. 2, a longitudinal vertical section of the same, taken through and  
20 in the line of the axis of the grinder.

The same letters indicate like parts in all the figures.

My present invention consists in arranging the grinder so that it shall receive in  
25 addition to its rotary a reciprocating motion in the line of its axis to pass its surface over that portion of the knives attached to a stock and held in appropriate boxes or between centers in a carriage which moves from end  
30 to end under the grinder and at right angles to its axis, the knife which is under the operation of the grinder being supported by a bed or gage plate which insures the grinding of the edge of each knife to the same  
35 distance from the axis of the stock to which they are attached.

In the accompanying drawings (*a*) represents a frame properly adapted to the operative parts of the machine, and (*b*) a carriage which slides crosswise on ways attached to a portion of the main frame, there being a screw (*c*) by which the position of this carriage can be set nearer to or farther from the grinding wheel (*d*). And this carriage is provided with ways at right angles  
40 to the ways on which it moves to receive another carriage (*e*) provided with boxes or center screws (*e'*) to receive the stock of knives (*f*) and this carriage receives a longitudinal reciprocating motion by being engaged by a catch lever (*g*) with the threads of a screw (*h*) that has its bearings in a standard (*h'*) on the lower carriage (*b*) and is provided with a pulley (*h''*) which receives motion by a belt (*i*) from a pulley  
50 (*j*) on the shaft (*k*) which receives motion

from the main driving shaft (*b'*) by a worm (*m*) and cogged wheel (*n*). The drum (*o*) on the main driving shaft communicates a rapid motion to the grinding wheel (*d*) by  
60 a strap (*p*) running out to a pulley (*q*) on its shaft (*r*) the journals of which are longer than the boxes in which they run that it, with the grinder may receive an endwise reciprocating motion which is communicated  
65 to it by a lever (*s*) embraced by a collar (*t*) and is jointed to another lever (*u*) which receives a vibrating motion from a crank (*v*) on the shaft (*k*) by a connecting rod (*w*).

The grinding wheel turns with the usual  
70 velocity of a grindstone and vibrates with its shaft as the carriage with the stock of knives moves from end to end. The knives on the stock are placed one by one in succession on the guard rest or gage and passes  
75 under the grinder while it rotates and vibrates, the vibration being essential to prevent the grinding surface from becoming uneven and to insure the proper grinding of the knives. The motion of the under carriage by means of the set screws or their  
80 equivalent is for the purpose of adjusting the edges of the knives to the guard rest or gage and to adapt the machine to different diameters.

The object for which this machine was first contemplated and designed, is to grind and perfect the edges of the knives such as I use in my straw cutter after they are attached to the stock or cylinder of the same  
90 in order to make their edges perfectly cylindrical. The manner in which I use this machine for this purpose is as follows. In order to prepare the knives for this operation I attach them to a stock which belongs  
95 to my first grinding machine, one at a time and in that machine I grind them to a flat thin bevel edge. They are then taken from the stock of that grinder and attached to the stock of the straw cutter which constitutes the cylinder of knives. (The first  
100 grinder was patented Sept 23, 1845, and is found to be an invaluable machine in the manufacture of knives for cylinder straw cutters. Reference is hereby had to the specification, drawings and model at the  
105 Patent Office.) I then apply this cylinder of knives to my last grinder in the manner above described, and by giving them a little shorter bevel, the grinding is perfected and  
110 but very little of the edge of the knives taken away.

It is obvious that this principle will apply to the grinding of any kind of cylinder knives or shears, such as are used for shearing cloth and for other purposes and that  
5 it can be applied to grinding the knives of straw cutters by attaching them to a stock like the one in my first grinder to prepare the bevels and then transferring them to the straw cutter stock and finishing them as  
10 above described; or they can be wholly ground and finished on the cylinder of the straw cutter or other cylinder stock.

What I claim as my invention and desire to secure by Letters Patent, is—  
15 The application of the grinding wheel

so mechanically arranged that while the grinder is made to revolve longitudinally on the edge of the knife, it receives at the same time a lateral reciprocating motion on its own axis which is at right angles with the  
20 line of the edge of the knife on the cylinder, or nearly so; in combination with the top and bottom traversing carriages and the gage rest constructed substantially in the manner as above described and for the pur-  
25 poses herein specified.

WILLIAM HOVEY.

Witnesses:

CHAS. W. HARTSHORN,  
JOHN C. B. DANIELS.