

(No Model.)

3 Sheets—Sheet 1.

O. BRYANT.
KNIFE GRINDING MACHINE.

No. 265,482.

Patented Oct. 3, 1882.

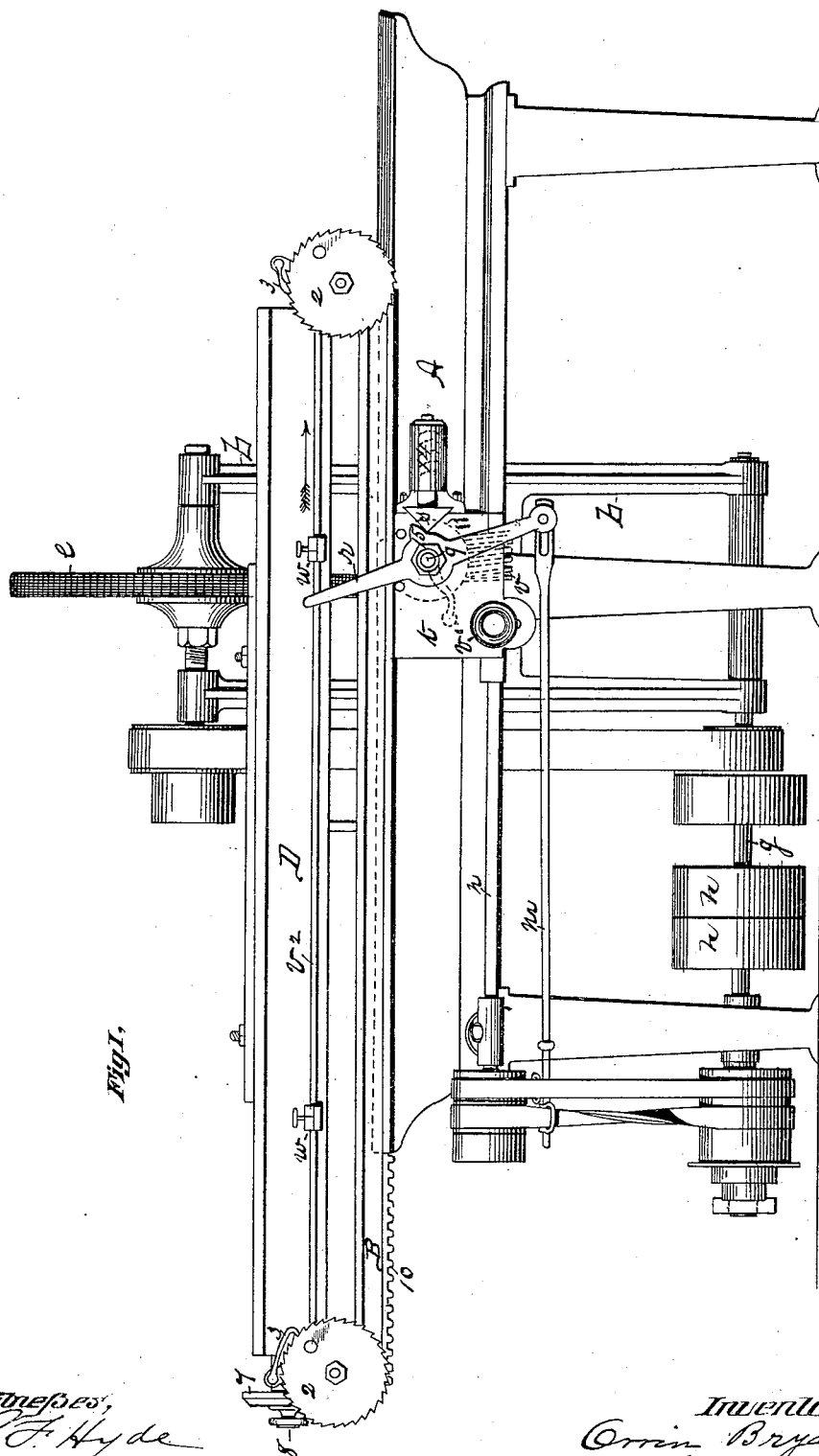


Fig. 1.

Witnesses,
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Wm. H. Chapin

Inventor;
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(No Model.)

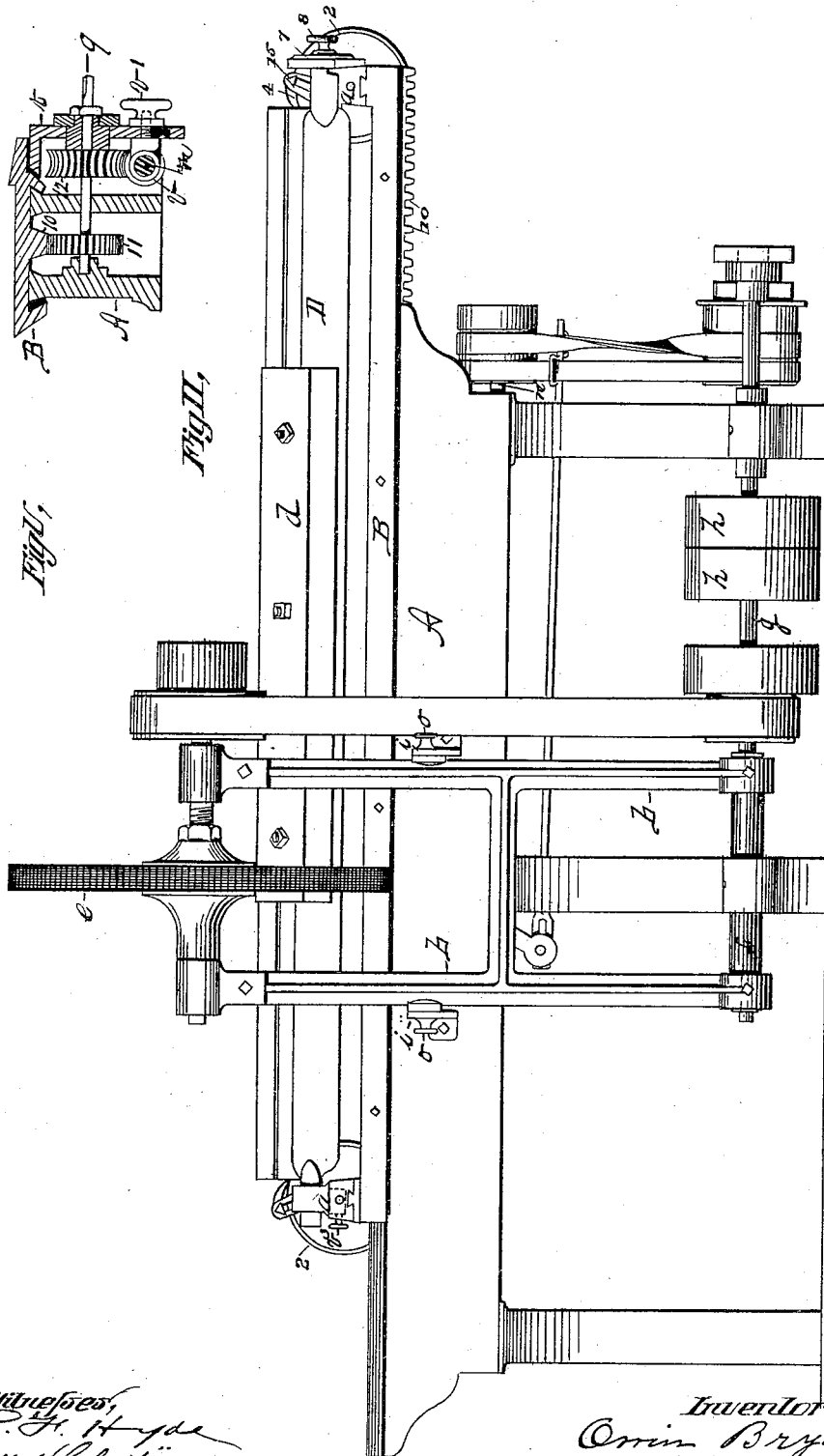
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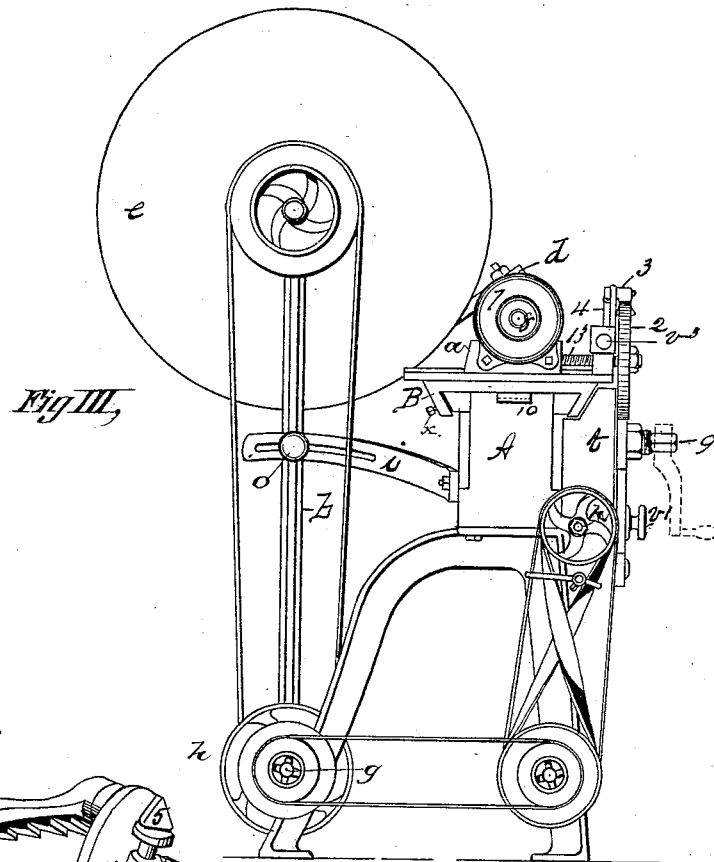
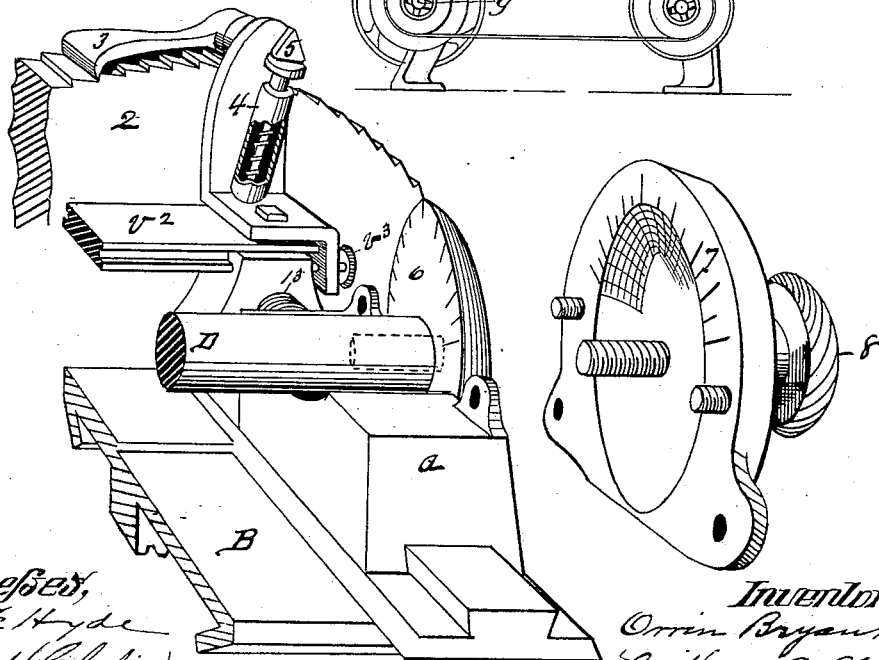


Fig IV,



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UNITED STATES PATENT OFFICE.

ORRIN BRYANT, OF WESTFIELD, ASSIGNOR TO ELWIN R. HYDE, OF
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KNIFE-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 265,482, dated October 3, 1882.

Application filed March 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, ORRIN BRYANT, a citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Knife-Grinding Machines, of which the following is a specification.

This invention relates to improvements in machines for grinding the beveled edge of long straight knives, and has reference more particularly to devices for giving to the knife-bar carriage a reciprocating movement along in front of the edge of the grinding-wheel, for feeding the knife-bar toward said wheel, and for adjusting the incline of said knife-bar, the object being to facilitate the adjustment of the various parts of the machine to its work and to simplify its construction.

In the drawings forming part of this specification, Figure I is a front elevation of a knife-grinding machine constructed according to my improvements. Fig. II is a rear elevation. Fig. III is an end elevation. Fig. IV is a detail view of one end of the knife-bar carriage and the cross-feed devices. Fig. V is a transverse section through the bed of the machine nearly opposite the grinding-wheel.

This invention is in the nature of an improvement upon the construction shown in Letters Patent to E. R. Hyde, December 13, 1881, No. 250,665, to which reference may be had.

The bed A of the machine is supported upon legs of the usual form, excepting that two of them extend rearwardly to provide suitable supports in which to hang the driving-shaft *g*, upon which are placed the pulleys *h h*, (one tight and one loose,) which receive the driving-belt, and cone-pulleys, from which the grinding-wheel *e* and the feed-shaft *n* are driven through suitable belts and pulleys. Said bed A has located upon it, fitted upon what are commonly called "gibbed ways," the knife-bar carriage B, so that the latter may have an easy reciprocating motion thereon, and upon the under side of said carriage is a rack, 10. A gib-screw, *x*, serving the usual purposes thereof, is placed in the flange of carriage B. A cross-shaft, 9, is hung in proper bearings on bed A, on which is a gear, 11, which engages

with said rack 10 on carriage B and a worm-gear, 12, and the outer end of said shaft 9 is adapted to receive a crank to serve to turn it for special adjustment of said bed, which crank is shown in dotted lines. A worm, *v*, on the feed-shaft *n* is adapted to be engaged with said worm-gear. Said feed-shaft *n* runs in a swivel-box located near its pulley end, and its worm-carrying end is supported in a box, *t*, into which a shouldered hand screw, *v'*, enters through a vertical slot in the side of the feed-worm box *t*, so that by lifting up on said screw the worm *v* may be engaged in gear 12, and the end of shaft *n* be secured in that position by turning in said screw, and by turning out the latter the end of said shaft may drop, disengaging said worm from said gear. Thus while the machine is being operated and worm *v* is in engagement with gear 12 shaft 9 is rotated and carriage B is caused to slide on bed A, and said carriage may be stopped at any point on bed A by dropping worm *v* away from gear 12.

A vibrating shipper-lever, *r*, is hung loosely on shaft 9, the lower end of which is connected to a slotted end of a horizontal shipper-rod, *m*, which carries suitable belt-guides for two belts—one open and one crossed—which run said shaft *n* in opposite directions, said belts being shipped off and onto a tight pulley on said shaft in a well-known manner. A lateral projection, 15, having two inclined sides terminating in a point, is placed on one side of lever *r*, opposite its center, against which a stop-bolt, *s*, having a triangle-shaped head, operates, forced by a spring located in the socket 14, so that when said lever is vibrated said projection is swung against said bolt, throwing the latter back; but as the point of one passes that of the other said bolt shoots out and causes said lever to be held in the position it has been swung to until it shall be carried in the opposite direction, as hereinafter described.

Upon carriage B is supported, upon two transversely-sliding axis-blocks, *a a*, the knife-bar D. Said blocks are adapted to slide on said carriage at each end thereof, actuated by the feed-screws 13, on the outer ends of which are secured the ratchet-wheels 22. The raised

portions of the carriage B, upon which said blocks *a a* slide, support on their ends near said ratchet-wheels a sliding cross feed bar, *v*², one end of which is shown in Fig. 4 in operative relation to other parts of the machine. Said bar *v*² extends in front of the machine, and has upon it the adjustable blocks *w*, which strike lever *r* as carriage B moves along on bed A, thereby causing said lever to so oscillate as to shift the belts which run shaft *n*, said lever reacting at about the terminal point in the movement of said bar *v*² and carriage B to cause said bar to slide reciprocally in its bearings. Upon said bar *v*², in the rear of the ratchet-wheels 2 2, are fixed two suitable stands, to which are hung the pawls 3 3, which pawls are secured each upon a bolt, 5, having a triangular-shaped head. A spring pawl-holder, 4, is located under the head of each of said bolts 5, and bears against the head thereof, so as to hold the pawl in proper engagement with the ratchet-wheel, or to hold the pawl off from said wheel when desired. The end of the said stand which carries the said pawl and pawl-holder is bent down by the end of bar *v*², as in Fig. 4, and through it is located the adjusting-screw *v*³, by which the stopping-point of said bar is determined as the end of said screw hits the part of the machine in which said bar slides. The knife-bar D, upon which the knife *d* is bolted to be ground, is provided with cylindrical bearings, and is supported, as aforesaid, on the blocks *a a*. One end of said knife-bar is provided with a head, 6, having graduating-marks thereon, and having its edge beveled, as shown, and against the side of block *a* is secured a head-socket plate, 7, also having graduating-marks thereon, and a tightening-screw, 8, passes through said plate into the end of said knife-bar. Thus the knife-bar D can be turned in its bearings to any desired incline, and be there secured by the screw 8, and when a knife or a series of knives have been ground to a certain bevel, of which note has been taken by the relative position of certain of said graduating-marks, (which may be properly numbered,) said knives may be reground to precisely the same bevel by setting said knife-bar to its former incline, and thereby a uniformity of work be secured.

The grinding-wheel frame *b* is provided with a pivot-sleeve, *f*, secured in its lower end, through which extends the shaft *g*, and said frame swings thereon. Two slotted curved arms, *i i*, are secured to the rear side of the machine, whereby by the aid of two binding-screws, *o o*, which pass through said slotted arms into frame *b*, the latter is supported in any desired position. The upper ends of said frame are provided with suitable bearings for a shaft, on which is secured the grinding-wheel *e*, and which is driven by a belt from shaft *g*.

The operation of this machine in grinding a knife is as follows: Said knife is secured to the bar D, and the latter is set to a proper incline,

and the frame *b* is swung up and secured in such a position as to bring the edge of wheel *e* into easy operative position relative to the knife *d*. By now sliding bar *v*² back and forth by hand the pawls 3 3 operate the wheels 2 2 and feed-screws 13 to carry the edge of the knife up to the wheel *e*. Carriage B is now, by turning shaft 9, moved along to bring one end of the knife at wheel *e*, and the blocks *w* are set on bar *v*² to cause them to operate lever *r* as soon as the end of the knife passes wheel *e* in either direction. Then worm *v* is lifted into engagement with gear 12, and the machine is started. The end of rod *m* is slotted to permit lever *r* to have a free swinging motion when one of the blocks *w* first strikes it, and whereby the projection 15 is thrown by the point of bolts *s*, when the force of the latter, immediately followed up by the said block, serves to quickly ship the belts which drive shaft *n*. The knife-bar carriage B now slides reciprocally on bed A, carrying said knife before wheel *e*, and when said carriage moves in the direction indicated by the arrow in Fig. 1, carrying the left-hand block *w* on bar *v*² against lever *r*, the latter is thrown over to the right, and so ships the belts as to reverse the motion of shaft *n*, and consequently that of gear 11, thus reversing the motion of said carriage. The resistance of lever *r* to said action of block *w* on bar *v*² causes the latter to slide a short distance to the left, carrying with it pawls 3 3, and the latter, engaging with the ratchet-wheels 2 2, cause the latter to rotate and the knife-bar D to be fed toward the wheel *e*. The following movement of said carriage B to the left carries the right-hand block *w* against lever *r*, again swinging the same and causing bar *v*² to slide back to the right, but this time not turning the wheels 2 2, but simply carrying pawls 3 3 over the teeth thereon preparatory to their engagement therewith, when said bar *v*² is next made to slide to the left, as before. By turning back screw *v*³ worm *v* is dropped away from gear 12 and all feed motion ceases.

By means of the swinging frame *b* the wheel *e* is made to approach the edge of the knife, as in said patent, to compensate for the gradual wear thereof, and by hanging said frame *b* so that the axis of its radial movement is that of the driving-shaft, from which motion is given to the grinding-wheel shaft at its swinging end, the necessity of taking up and lengthening the belt which drives the wheel *e* does not exist, for how much so ever said frame may swing the axial centers of shaft *g* and the grinding-wheel shaft are always the same distance apart.

The pawl-disengaging plates shown and described in said patent may be advantageously applied to the ratchet-wheels of this machine.

What I claim as my invention is—

1. In combination with the mechanism, substantially as described, for feeding the knife-bar toward the wheel *e*, the knife-bar carriage

B, bar v^2 , blocks w , lever r , bolts s , and rod m , having one end slotted, substantially as set forth.

2. The bar v^2 and mechanism, substantially
5 as described, for sliding it on carriage B, the
pawls 3 3, secured to the triangular-headed
bolts 5, the pawl-holders 4, the adjusting-
screws v^3 , wheels 2 2, and the feed-screws 13,
combined and operating substantially as set
10 forth.

3. The knife-bar D, having the graduated head 6 thereon, the graduated plate 7 to receive said head, and screw 8, combined and operating substantially as set forth.

ORRIN BRYANT.

Witnesses:

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