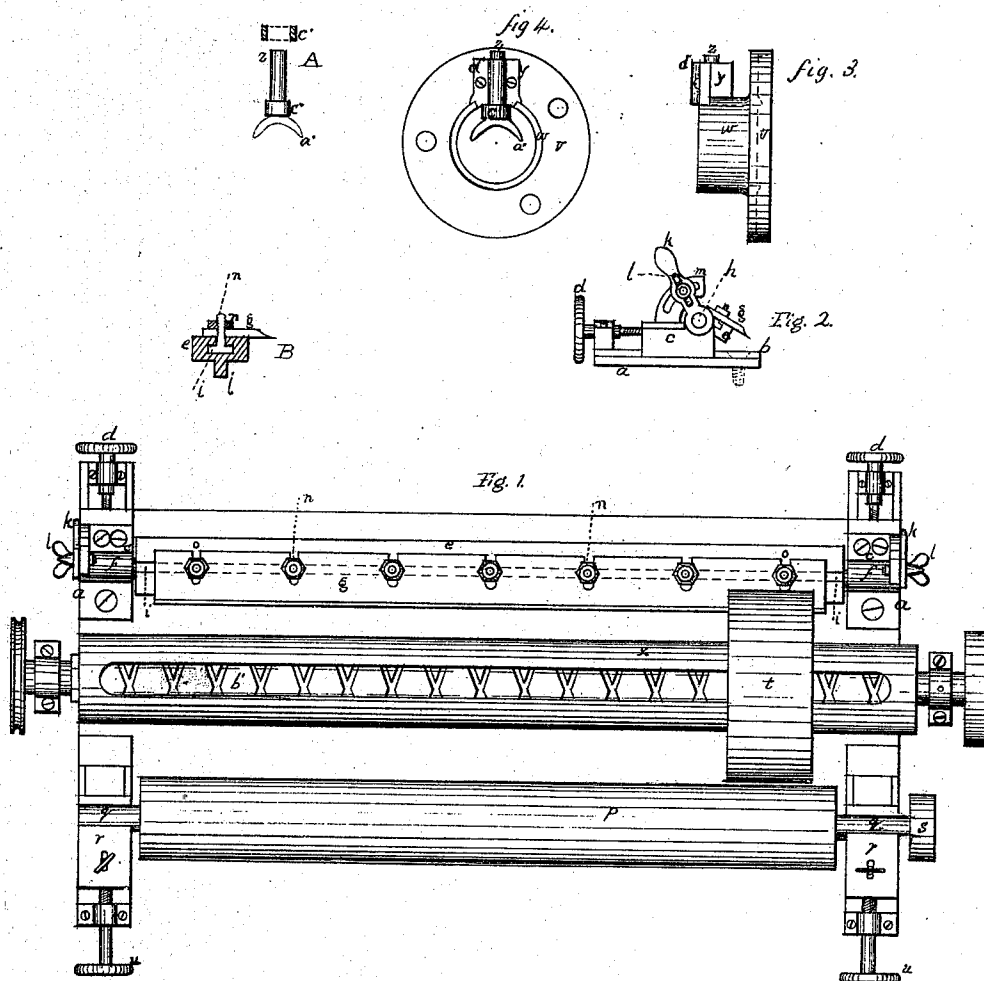


C. Hardy,

Grinding Machine.

No. 104,584.

Patented June 21, 1870.



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CHARLES HARDY, OF BIDDEFORD, MAINE.

Letters Patent No. 104,584, dated June 21, 1870.

## IMPROVEMENT IN GRINDING LEDGER AND FLY-BLADES, PLANER-KNIVES, &c.

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

### To all whom it may concern:

Be it known that I, CHARLES HARDY, of Biddeford, in the county of York and State of Maine, have invented a new and useful Machine for Grinding Ledger and Fly-Blades and Planer-Knives, and Truing Dresser-Rolls, &c.; and I hereby declare the following to be a full, clear, and exact description thereof, which will enable others to make and use my invention, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a top plan.

Figure 2 is a side elevation of the device for adjusting to the grinding-wheel a planer-knife, or other article to be ground.

Figure 3 is a side elevation of a portion of the grinding-wheel.

Figure 4 is an end view of the same.

A shows the piece by which the motions of the grinding-wheel are regulated by the spiral, and by which said machine is connected with the spiral.

B is an end view of the method of securing a planer-knife for grinding.

Letters Patent of the United States have already been granted to me for a machine for grinding the card-teeth of carding-cylinders, dated February 5, 1861; also, for a machine for grinding top cards, workers, &c., said patent being dated April 16, 1867. In the present application, and in the two patents above named, there are certain parts that are common to all, which parts I do not, of course, now claim; such being a shaft, provided with a helical groove thereon; a grinding-wheel, having a reciprocating rectilinear motion, caused by the said helix or groove, and on a tubular shaft surrounding the shaft having the helix.

My present invention consists—

First, of a device or devices for holding a planing-machine knife while being ground, and for adjusting the same to the wheel by which it is ground.

Second, of an application of means for grinding ledger or fly-blades, and for truing dresser-rolls.

Third, of an improvement in the method of connecting the grinding-wheel with the spirally-grooved shaft, by which a better operation and greater durability are secured.

In the grinding of ledger-blades and planer-knives, and in truing dresser-rolls, &c., it is, in the first place, very important that the same should be ground with perfect evenness and uniformity. This is especially the case with ledger-blades and planer-knives, as may be seen from the nature of the use to which they are applied.

In the case of planer-knives, in the manner in which they have hitherto been ground they have been liable to become sprung and bent, and there was no security that they were being ground true, except by sighting,

or by other methods of ascertaining the same. This remark applies also to leather-splitting knives, which, in the nice operations in which they are employed, should also be true and even. My invention seeks and accomplishes the grinding of the knives with evenness and trueness. The above are some of the objections which my invention seeks to obviate.

It may here be remarked that the method of imparting motion to the cylinder and rollers is similar to that in those machines on which Letters Patent have been granted to me, and which is not herein claimed.

The method of attaching planer-knives to my machine, for the purpose of grinding, may be thus described:

Upon the top of the frame of the machine, upon either side, are bolted the plates *a*, with the dovetailed piece *b* rising therefrom. Moving upon the piece *b* is the sliding carriage *c*, with a dovetailed groove in the bottom side thereof, to fit over the track or piece *b*. The carriage *c* is moved backward and forward over the track by means of the screw and thumb-piece *d*. Set in the carriages *c*, in the boxes *f* on shafts *h*, is a plate of metal, *e*, extending from side to side of the machine. This plate *e* has the groove *i* extending the entire length, which groove is widened at the bottom, as shown at B, and, on the bottom side thereof, has the strengthening piece *j*, to make the carrier firm and rigid. Set on the ends of the trunnions *k* are the levers *l*, having set-screws *l* to slide in the slots of the curved pieces *m*. By means of the levers *k* any desired inclination may be given to the plate *e*, as illustrated in fig. 2, and, when the desired position is attained, the plate may then be held securely by means of the thumb-screws *l*.

In the drawing—

*g* shows a planer-knife, attached to the plate *e* by means of bolts and nuts *n*, the said bolts having heads which fit into the enlargement *i* of the slot in *e*. These bolts fit in the slots *o* of the planer-knife, and are then secured by the nuts *n*, as already described.

It will thus be seen that the planer-knife is secured to the plate *e* in a manner similar to that, as far as the knife itself is concerned, by which it is secured in the machine for use. It is thus prevented from bending or springing, the table or rest *e* being first constructed perfectly true. The effect of this method of grinding the knife is to slightly concave the edge thereof, as illustrated at B, thus very much diminishing the wear of the knife by the process of grinding. From the method employed to adjust the knife, it will be seen that it can be very accurately adjusted, and very evenly and uniformly ground.

*p* represents a dresser-roll, which can also be trued in my machine, when the same has been sprung or worn.

The roll is first placed, by means of its own journal or shaft *g*, in the box or bearing *r*. A motion is imparted to the roll by the pulley *s*, from which a band extends to a fixed pulley on the motor-shaft of the machine. The position of the roll, relative to the grinding-wheel *t*, is regulated by the sliding box or bearing *r*, adjusted by the thumb-screw *u*.

Great difficulty has been experienced hitherto in repairing dresser-rolls after the same have become sprung and creased by use, and in preserving the roll perfectly true and even. The truing has hitherto been done by turning them off in a lathe, and then smoothing them. This very rapidly wastes and wears away the material or stock of the roll, while, in my machine, no more is taken off than is absolutely necessary for the purpose of truing. This is evident from the method employed in my machine, under which the roll lasts much longer.

The same remarks apply to ledger and fly-blades, where a slight variation in the edges of the spiral knives, on the face or surface of the ledger-blade or roll, might effect serious injury to the goods which are subjected to them. The threads might be cut as the cloth passes between the roll and blade. This is plain, as, on account of the proximity of the roll and blade, *i. e.*, the fly or ledger-blades, the cloth passing between them might be cut, and the threads injured by the knives.

Fig. 4 illustrates my improvement in the method of managing the grinding-wheel, different from that in the patent above referred to.

An edge view of one portion of the wheel is shown in fig. 3, in which is seen the face-part *r*, and the hub or center-part *w*, which surrounds the tubular shaft *x*.

From *w* rises the projection *y*, having a socket to receive the stock *z*, which has, at the end, the bifur-

cation or curved part *a'*. This curved part fits into the helical grooves on the shaft *b*.

Upon the stock *z*, just above the bifurcation *a'*, I place the loose steel ring *c'*, which is of great value in the operation of the grinding-wheel, relieving, as it does, the guide *z a'* from binding, wear, and friction against the slot of the tubular cylinder, and preventing any obstacle to the free reciprocating motion of the grinding-wheel.

The face-plate *d'* is bolted or screwed to the part *y*, as shown in figs. 3 and 4.

Formerly, the curved or crescent piece was fitted with a socket, and the guide turned on the lower end of the stock *z*, but, with this construction, the bifurcated part worked loose, and, becoming thus, had a tendency to bind in the screw or spiral, and injure the same, and also impede the freedom of motion of the grinding-wheel. With the present arrangement, the friction of the stock *z* against the edges of the slot in the shell, or tubular cylinder, is much reduced, and the durability of the guide, as well as its freedom of operation, is much better attained.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The improved devices for securing, adjusting, and grinding planer-knives, as hereinbefore described, consisting of the grinder *t*, tubular shaft *x*, and shaft *b*, in combination with the plate *e*, with slots *i*, bolts *n*, carriage *c*, thumb-screws *d*, slotted guide *m*, and lever *k*, as shown and set forth.

2. The construction of the guide *z a'*, figs. 3 and 4, and the ring *c'* on the stock *z*, as set forth.

CHARLES HARDY.

Witnesses:

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