J. S. ELLIOTT.
Harvester-Grinder.

No. 211,138. Patented Jan. 7, 1879.

Fig. 1.

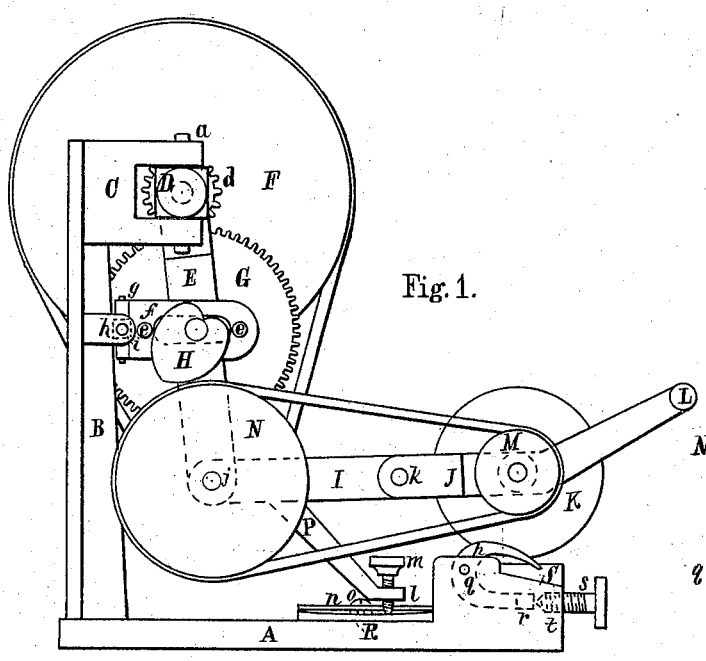


Fig. 2.

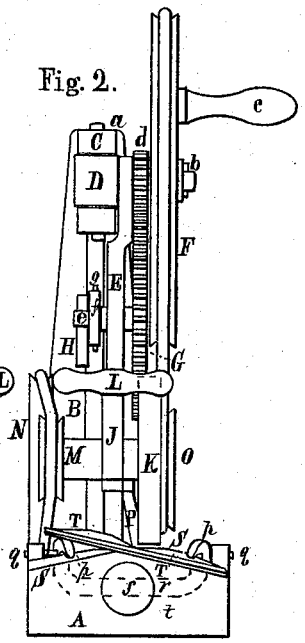


Fig. 3.

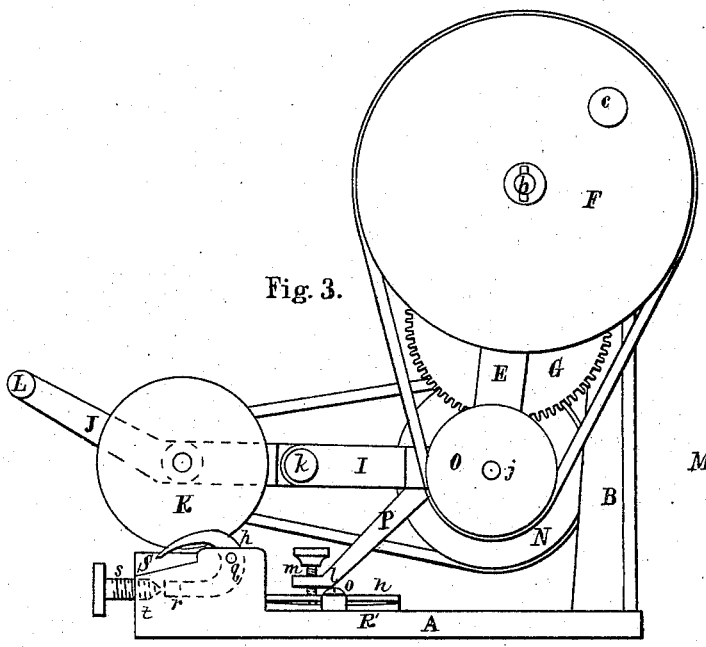
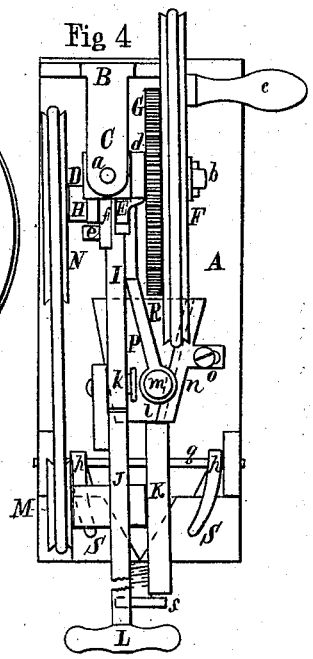


Fig 4



Attest;

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per Josiah S. Elliott,
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Fig. 5.

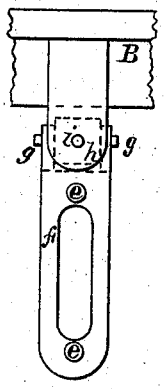
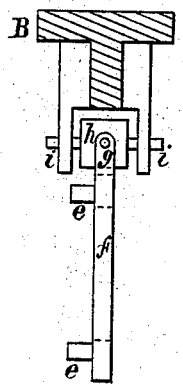


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSIAH S. ELLIOTT, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN HARVESTER-GRINDERS.

Specification forming part of Letters Patent No. **211,138**, dated January 7, 1879; application filed March 15, 1878.

To all whom it may concern:

Be it known that I, JOSIAH S. ELLIOTT, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Machines for Grinding the Knives of Harvesters, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention consists, first, in a self-feeding attachment by which the lever to carry the grinding-wheel across the bevel of the cutting-edge of the knife is caused to swing by a revolving cam, or its equivalent; secondly, in so connecting a guide-plate, suitably formed, and guide-bars to the base of the machine, and a point or foot-piece to travel on the guide-plate to the swinging lever or arm working in conjunction therewith, that the grinding-wheel shall travel in its reciprocating mortion horizontally and upon the bevel of the knife; thirdly, in setting the plates to which the knives are clamped while being ground at such an inclination thut the bevel of the knives shall be in a horizontal plane, or a plane parallel with the grinding-face of the grinding-wheel; and, fourthly, in such novel parts or combination of parts as are hereinafter described.

In the drawings, Figure 1 is a side view, Fig. 2 a front view, Fig. 3 a view of the opposite side from that of Fig. 1, and Fig. 4 a plan view, of a grinding-machine embodying my invention. Figs. 5 and 6 are enlarged side and plan views, showing the manner of hanging the arm *f*.

In Fig. 2, and in that alone, a part of a set of knives is shown in position for grinding one of the edges of a knife.

A is the stationary base, and B an upright fixed thereto. To the upright is firmly secured the arm C, which is shaped to receive and form bearings for the block D, the latter being pivoted therein by the vertical pin or shaft *a* to swing horizontally. To the block D is secured the stud *b*, on which is pivoted the swinging lever E, and on which also runs the main driving-pulley F. To this pulley is firmly fixed, to revolve with it, a pinion, *d*. This pinion works in a gear, G, which is on a shaft having bearings in the swinging lever E. On this shaft, to revolve with the gear G, is a cam, H, which works against bearings *e* fixed on an arm, *f*. This arm has a slot, as shown, through which the shaft of the cam passes, and by which it is partially guided and supported. The arm *f* is pivoted at *g*, so that it may swing horizontally to a block, *h*, which is held to the upright B by a shaft or bar, *i*, so as to have a slight swinging motion vertically and a horizontal sliding movement.

Pivoted at *j* to the swinging lever E is the arm I J, which bears the grinding-wheel K, and is extended to receive the cross-bar or handle L, to be held in the hand while guiding the wheel in grinding. The grinding-wheel is fixed on a shaft, which also has fixed thereon a pulley, M. A belt passes from this pulley to a pulley, N, which has fixed with it on the same shaft a pulley, O, this shaft passing through the arm I J and lever E, and forming a pivot by which the arm I J may swing vertically. A belt runs from the driving-pulley F to the pulley O.

The arm I J is in two parts, which are held together at *k* by the clamp-screw *k'*, for the purpose of setting the grinding-wheel and adjusting it as it wears by swinging the part J vertically on the pivot formed by the screw *k*. To the part I is fixed the arm P, which has the foot-piece *l*, through which passes the adjusting-screw *m*, having a bearing-point to rest on the guide-plate R. This guide-plate is fixed to the base A, and is of such a form and curve that the point of the screw *m*, traveling thereon, will cause the grinding-face of the wheel K to bear upon the bevel of the knives set in a horizontal plane. Two guide-bars, *n*, only one of which is shown in the drawings, are held to the base A, one on each side of the guide-plate R, by the adjusting-screw *o*.

Two tables or plates, S, are fixed to the base A at the proper height, and are set at such an inclination, each being inclined in two directions, one direction toward the front and the other toward the side of the machine, that a knife, T, resting on either table, shall bring the bevel of one of the cutting-edges in a horizontal plane, as shown in Fig. 2. Fingers *p*, pivoted at *q*, having an arm, *r*, attached, which

is pressed against by a clamp-screw, *s*, screwing through the upright *t*, clamp a knife to either table or plate S. The fingers *p* being joined together as one piece by the arm *r*, and the distance from outside to outside of the fingers being less than the distance between the bearings of the shaft or rod on which they are pivoted, they may slide on this rod or shaft to bring one finger to one of the plates S, while the other bears on a knife.

It is desirable that both fingers should bear; and to accomplish this, owing to the plates S being inclined, as shown, and the thickness of the knife, the sliding of the fingers *p* is necessary.

The operation of the machine is as follows: A knife being clamped to one or the other of the tables S, according as which cutting-edge is to be ground, and so that the bevel to be ground is in a horizontal plane, the handle L is grasped by one hand, while the crank-handle *c* is taken in the other. Then by turning the crank the grinding-wheel K will be revolved by means of the pulleys F, O, N, and M and the belts shown, the relative size of the pulleys determining the speed of the grinding-wheel. At the same time the pinion *d* revolving turns the gear G, and hence the cam H, in suitable speed, which is determined by the relative size of the pinion and gear. The cam H, working against the bearings *e*, will cause the lever E to swing and the grinding-wheel to travel back and forth along the bevel of the knife, the guide-plate R and point *m* causing the face of the grinding-wheel to bear on the knife in the horizontal plane, and one of the guide-bars *n* causing the grinding-wheel to travel along the bevel of the knife.

Instead of the heart-shaped cam H here shown, and which seems best, since it gives an equal motion to the swinging lever in equal times, its revolution being of any given speed, other forms of cams or a device to produce an equivalent effect might be used. Instead of the pulleys F and O, gears may be used. Supports (not here shown) may be fixed to the base A, and extend right and left of the plates S, to sustain the set of knives while one of them is being ground.

I claim as my invention—

1. The swinging lever E, cam H, arm *f*, arm I J, and grinding-wheel K, combined and operating substantially as hereinbefore set forth.

2. The guide-plate R and arm P, having the foot-piece *l*, in combination with the swinging lever E and arm I J, substantially as and for the purpose hereinbefore set forth.

3. The guide-bars *n*, in combination with arm P, having the foot-piece *l*, lever E, and arm I J, substantially as hereinbefore described.

4. In a machine for grinding the knives of harvesters, the tables or plates S, set at the inclination, substantially as and for the purpose hereinbefore set forth.

5. The combination of the pinion *d*, gear G, cam H, swinging lever E, and arm *f*, the latter pivoted and held at *g* and *i*, and having the lugs or bearings *e*, substantially as hereinbefore described.

6. In combination with the inclined plates S, the fingers *p*, arranged to have a sliding movement, substantially as and for the purpose hereinbefore set forth.

JOSIAH S. ELLIOTT.

Witnesses:
EDW. DUMMER,
H. W. BRICHER.