2 Sheets--Sheet 1.

J. S. ELLIOTT.

Knife Grinding-Machine.

No. 163,369. Patented May 18, 1875.

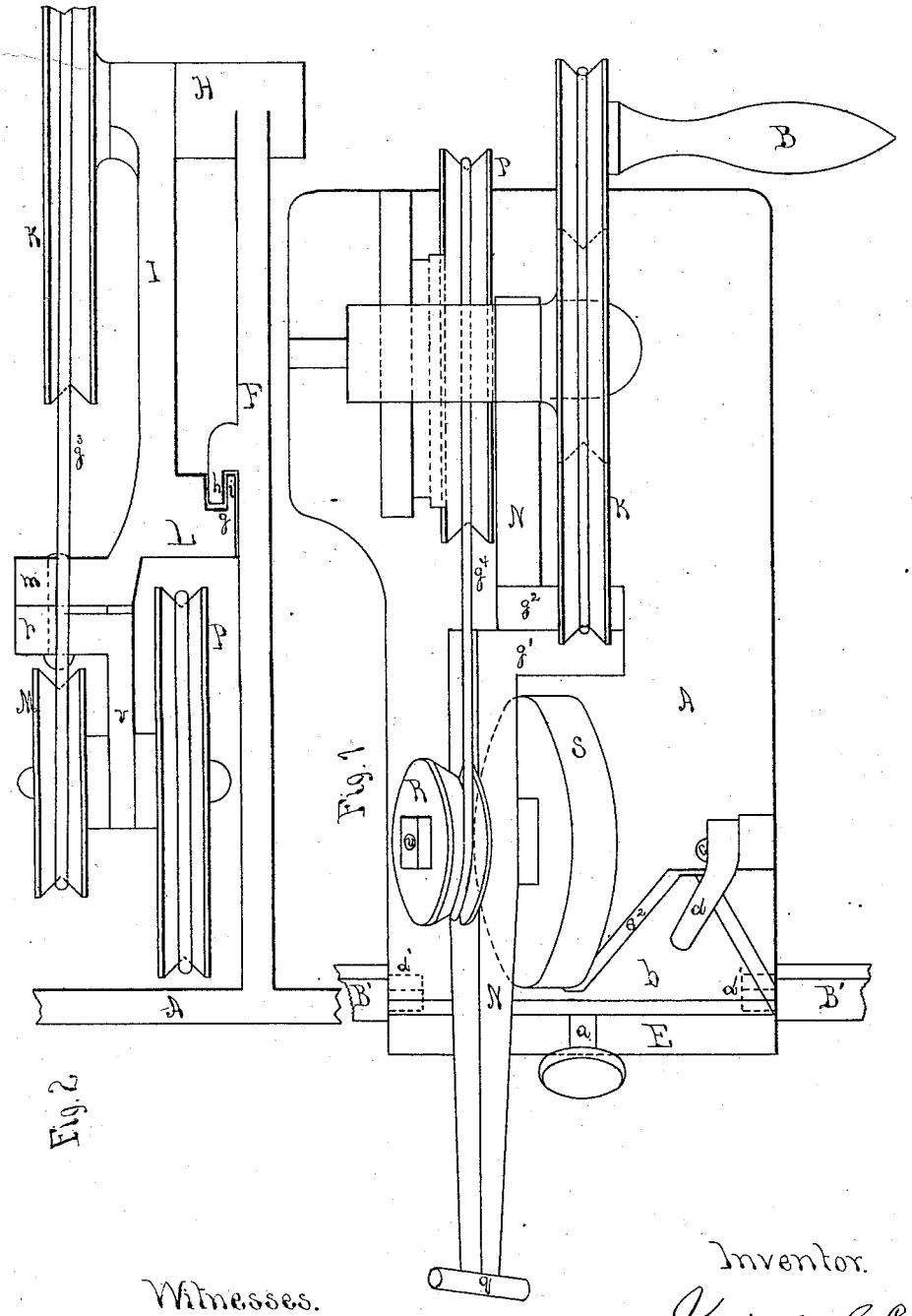

Fig. 2.

Witnesses.

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Nathan Brown

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2 Sheets--Sheet 2.

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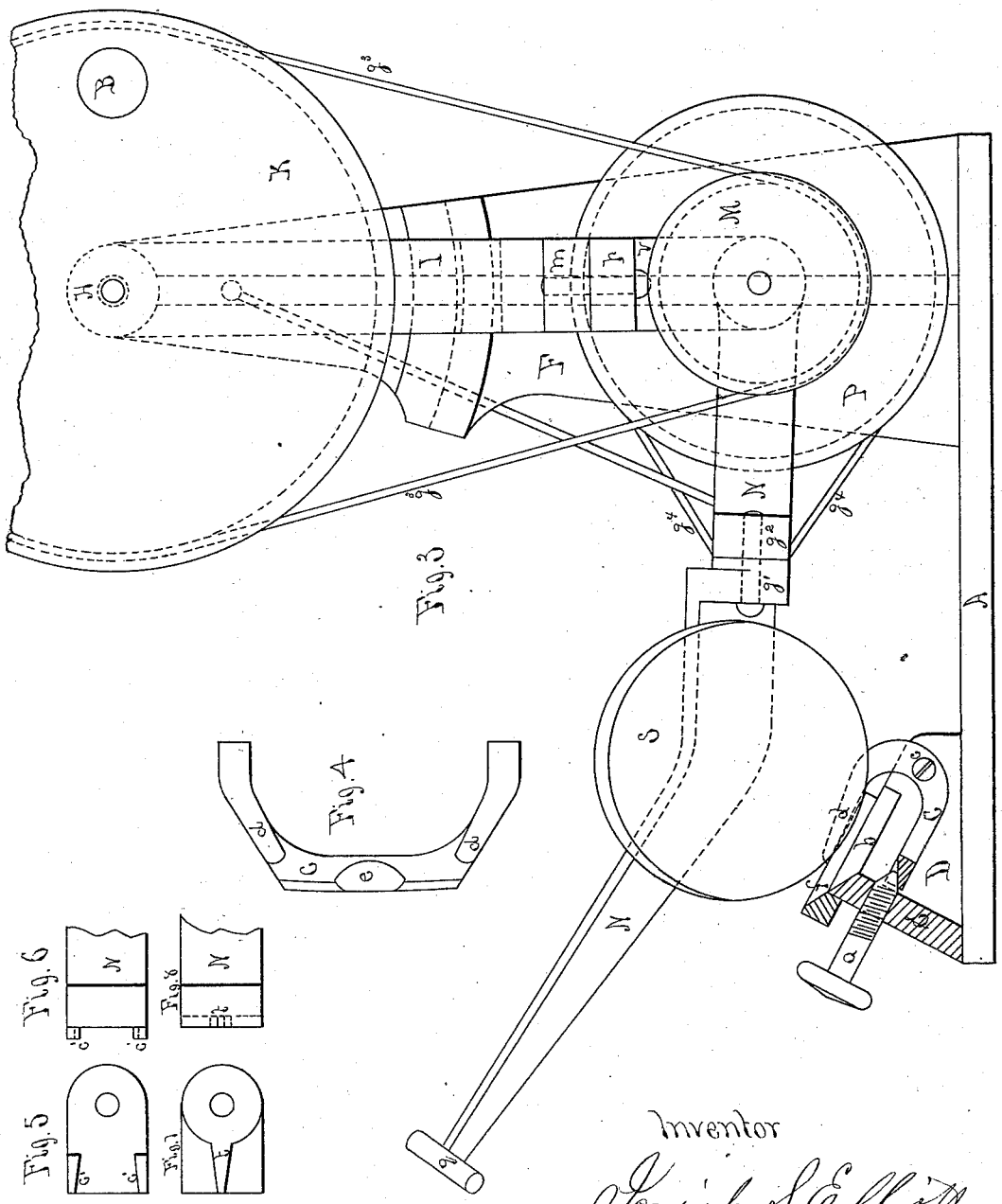

Fig. 3

Fig. 4

Fig. 6

Fig. 6

Fig. 5

Fig. 7

Witnesses.
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UNITED STATES PATENT OFFICE

JOSIAH S. ELLIOTT, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN KNIFE-GRINDING MACHINES.

Specification forming part of Letters Patent No. **163,369**, dated May 18, 1875; application filed April 6, 1874.

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 certain new and useful Improvements in Machines for Sharpening Harvester-Knives, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a plan or top view; Fig. 2, a rear side elevation; Fig. 3, an end view; Figs. 4 to 8, inclusive, are detached details.

This invention relates to certain new and useful improvements in machines for sharpening or grinding the knives or cutters of harvesters and mowing-machines, and has for its object to do the work in a superior manner and with reasonable facility.

This invention consists, first, in a knife-block, a cam, and a screw for holding the harvester-knives while being sharpened. Second, my invention consists of the curved guide L *g h*, or mechanism for guiding the frame I in its forward and backward movements, while operating the grinder-wheel upon the knives or cutters secured to the knife-block.

In the said drawings, A represents a bed, base, or bottom, to the forward end of which I apply an inclined knife-block, and to the latter a pivoted cam, C, and a screw, *a*, to operate the cam. The knife-block is constructed with ends D, a back, E, and a top, *b*, with a central angular space or recess, like or similar in form to the spaces between the harvester-cutters, but with sufficient surface at each end of the space to firmly support the cutters when secured by the horns *d* of the cam, and while being sharpened. The back E of the knife-block is the nut or screw-threaded passage for the screw *a*, which has a conical point or end, to operate on an incline, *e*, or bevel formed in the upper side of the bar of the cam. This element is clearly shown in Fig. 3, and in detail in Fig. 4. The cam C is pivoted to the ends of the knife-block, as seen in Figs. 1 and 3, and the horns *d* of the cam extend forward from and above the curve where pivoted, and over onto the top of the block, and the blade *f* or knife thereon, so that by turning the screw in, its conical point acts upon the bevel *e*, depresses the forward bar of the cam, and by means of its fulcrum-pivots *c*, brings the horns *d* firmly and forcibly onto the top of the knife, and holds it while being sharpened. At the opposite side of the machine a supporting-stand, F, rises above the bed or base A, and to the top of this stand a horizontal stud or shaft is secured to the hub H, and on this stud I pivot the swinging frame I and the driving-pulley K. The frame or arm I is constructed with a curved side offset, L, having a groove, *g*, which engages with a tongue, *h*, formed on the side of the stand F. A lip, *i*, rising at one side of the groove *g*, holds the frame one way, thus making a grooved guide to retain the arm I in position laterally, or to cause the arm to swing in a direct line forward and backward. A little below the curved guide and on the outside of the arm I is an ear or flange, *m*, and below this a similar ear, *p*, which, with the ear first named, forms a swivel-jointed connection in the arm. By pivoting the two ears together, the lower end *v* of the arm or frame extends below the ear *p* a sufficient distance to admit a pulley, M, as shown, and to the lower end of the arm a bar or beam, N, is pivoted, and forked onto the arm portion *v*. The rod or pivoting last named is the shaft which carries the pulley M and a driving-pulley, P. The beam N extends forward over the knife-block, where its end may have a handle, *q*, within convenient reach of the operator, and the central portion of this beam has a swivel-jointed connection, g^1 g^2, like or similar to that in the frame I, and pivoted together. Above the knife-block a shaft, *u*, passes through the bar or beam N, and on one end of said shaft is a pulley, R, and on the opposite end the grinder-wheel S, in a suitable position to operate on the knife *f* secured to the block beneath the wheel. The jointed connections in the frame I and in the beam N are constructed each with a stop, *t*, and side lips *c'*, to prevent turning the parts too far in either direction. These stopping devices are clearly shown in Figs. 5 to 8 inclusive. The pulley K is provided with a crank-handle, B, by which to revolve it, and a band, g^3, passes around this and the pulley M to rotate this and the pulley P on the same shaft. A second band, g^4, over the pulleys P and R, operates the latter and the grinder-

wheel S on the same shaft, and when thus revolving the grinder-wheel is guided by the handle *q* and the beam N into suitable operating contact with the knife or cutter, and along the opposite beveled edges e^2 as it lies on the inclined knife-block, the frame I swinging forward or backward on its shaft or pivoting, and kept in line by the curved guide, and the swivel-jointed connections in the frame I and the beam N enable these parts to be swung or moved in any direction to accommodate the grinding-surface of the wheel S to the entire length, bevels, and inclines of the knife, knives, or cutters. To the back E of the knife-block, and at each or either end thereof, and on a plane with the top of the knife-bed *b*, I apply knife-supporting bars B′, which are preferably removable in slotted guides *d′* secured to the back E, as shown. These bars B′ are to support long blades while sharpening the cutters at or nearest the ends, and which, if allowed to overhang the ends of the block, and unsupported, would bend or sag downward, and hinder the grinding process, or injure the long blades. These supporting-bars may be advantageously used on a differently-constructed knife-block, or one having a different knife-holding device, or with a different driving and grinding apparatus, and still perform the duty intended and described.

I contemplate that skillful artisans may modify my improvements in various ways, without departing from the merits and principles of my invention, and that a knife-block connected to the base or bed-plate, and having a horizontal top, may be used instead of one with the top on an incline, which latter is preferable by reason of its affording better and more convenient opportunity for the operator to see and watch the grinding operation, without stooping or bending over. I also contemplate that the knife-block, and the cam and operating screw shown in the drawings, may be used to secure and hold harvester-knives for grinding, with the base and stand, connected driving and grinding apparatus constructed different from that shown and described, but upon substantially the same principle, and capable of producing substantially the same motions or movements.

I claim as my invention—

1. The knife-block, constructed as described, with ends D, and inclined back, E, and a recessed top or knife-bed, *b*, and provided with a cam, C, constructed as described, and pivoted to the ends of the block, and with a screw, *a*, for operating the cam, substantially as described.

2. The curved guide L *g h*, or frame-guiding mechanism, in combination with base-sup-supported stand F, and the pivoted swinging frame I, and guiding the latter, substantially as described.

3. The construction of the jointed connection of the beams, viz, the two ears *m* and *p*, or *g* and g^2, pivoted together, as shown, and having upon their adjacent faces the tongue *t* and stops *c*, substantially as described.

JOSIAH S. ELLIOTT.

Witnesses:

JOHN E. CRANE,

NATHAN BROWN.