

(No Model.)

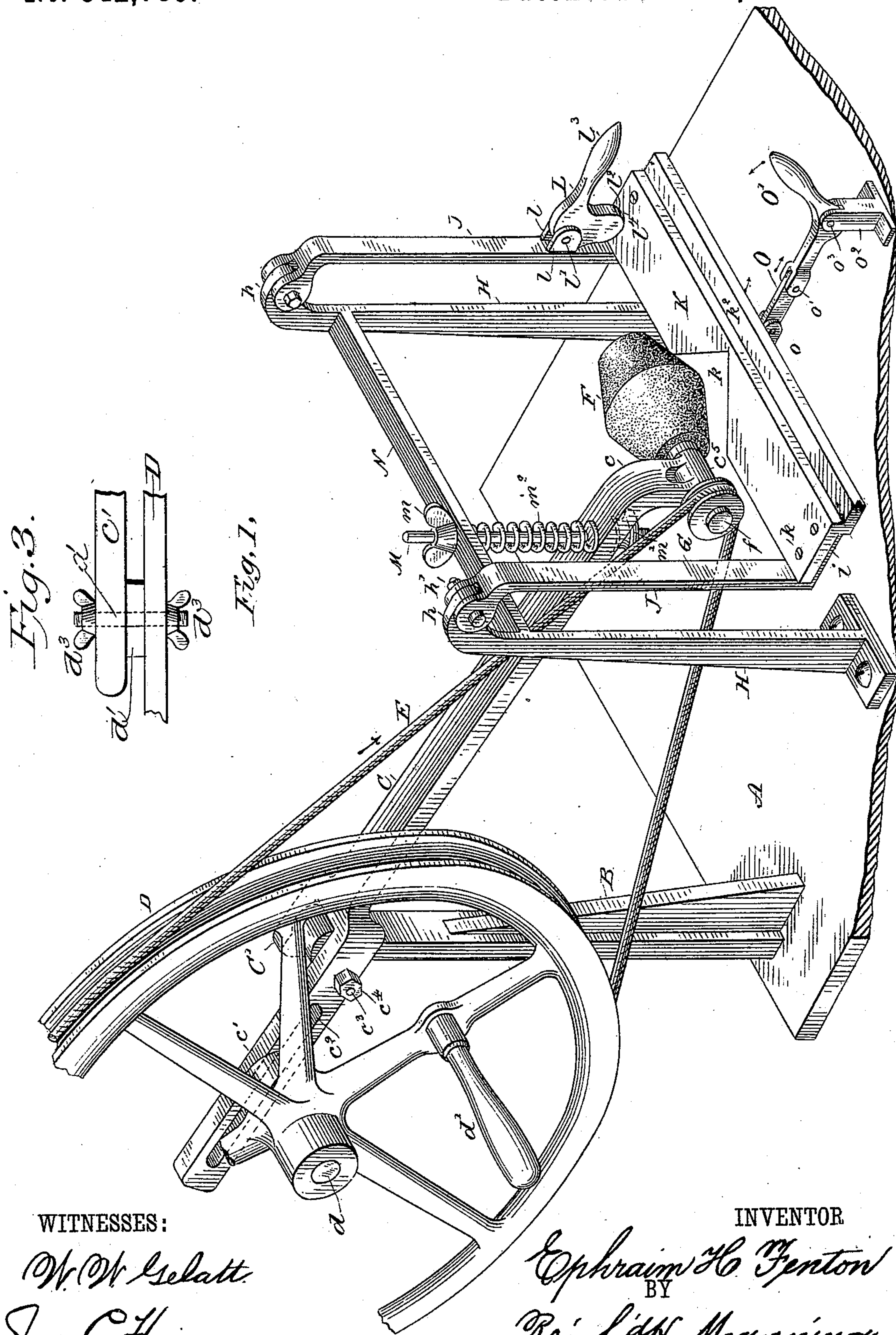
2 Sheets—Sheet 1.

E. H. FENTON.

GRINDING MACHINE FOR MOWER AND REAPER KNIVES.

No. 342,789.

Patented June 1, 1886.



WITNESSES:

W. W. Selatt.

Jos. C. Henry

INVENTOR

Ephraim H. Fenton

BY

Richard H. Manning

ATTORNEY



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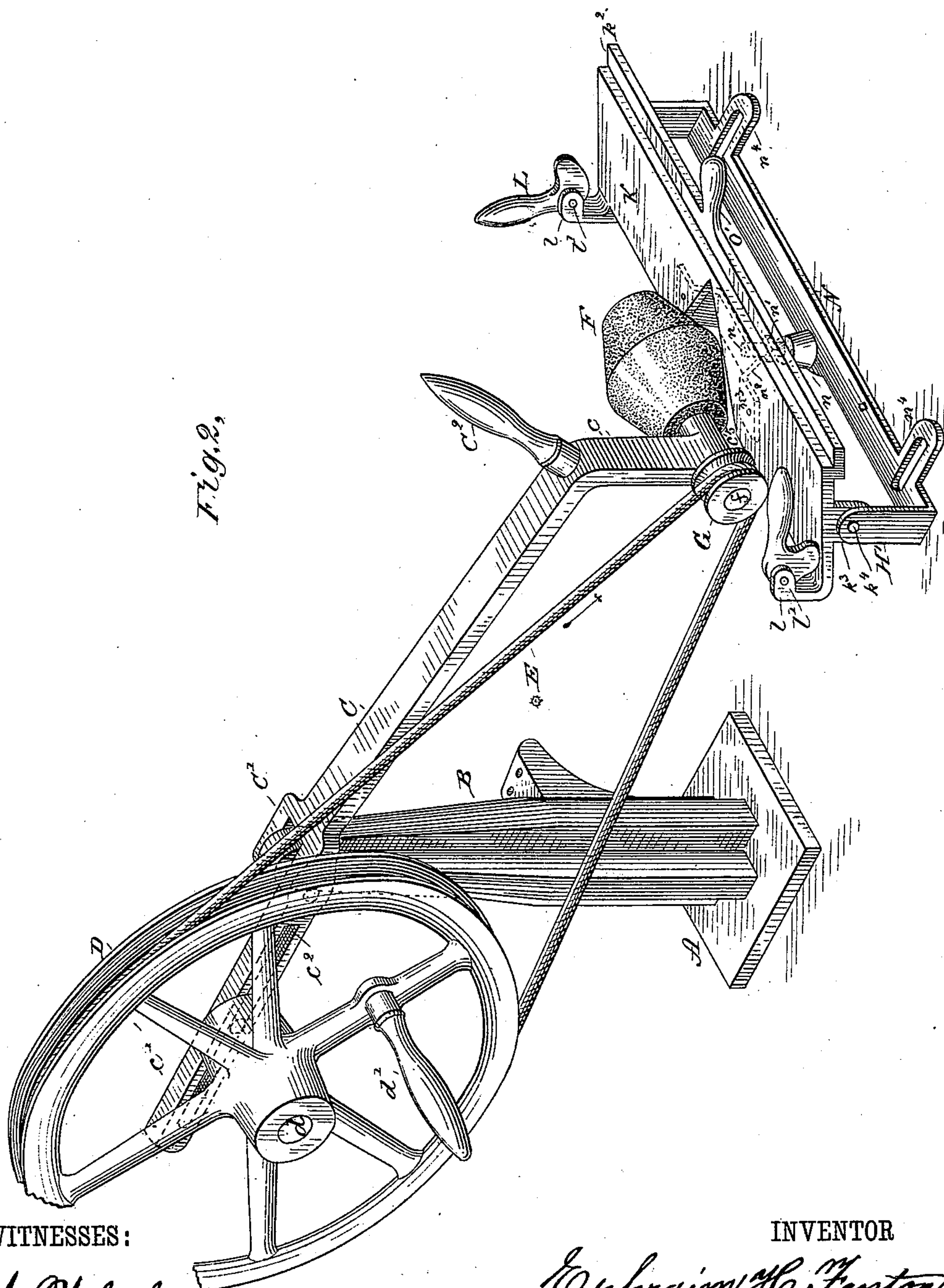
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# UNITED STATES PATENT OFFICE.

EPHRAIM H. FENTON, OF KANSAS CITY, MISSOURI.

## GRINDING-MACHINE FOR MOWER AND REAPER KNIVES.

SPECIFICATION forming part of Letters Patent No. 342,789, dated June 1, 1886.

Application filed September 10, 1885. Serial No. 176,663. (No model.)

*To all whom it may concern:*

Be it known that I, EPHRAIM H. FENTON, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Grinding-Machines for Mower and Reaper Knives; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to afford a grinding-machine for mower and reaper knives, in which the grinding devices may be adjustably balanced and kept from contact with the knives at proper times, and the knives may be presented at the proper angle in the most convenient manner; and it consists in the novel construction and combination of its several parts hereinafter described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the improved machine. Fig. 2 is a perspective view of the same, showing alternate means for changing the angle of the table and operating the balance-lever. Fig. 3 is a view of a portion of the lever, showing the collar and shaft for the tension-wheel and the nuts on the ends of the shaft.

In the construction of my invention I attach to a suitable bed or table, A, the upright standard B. I then make a lever, C, of a suitable length, one portion of said lever extending horizontally in the direction of the table and carrying the grinding-disk, the end *c* of which is bent downwardly nearly at right angles thereto, to secure the grinding-disk, and the opposite end of said lever C made with a forked extension, *C' c'*, continued in the same relative plane with the portion C, which portion *C'* of said forked extension is made shorter than its opposite portion, *c'*. The lever C is then pivotally attached to and placed upon the upper end of the standard B, so that the forked extension *C' c'* incloses said end and a perforation made transversely through the forked portion *C' c'* of said lever, and also through the standard, and the shaft *c<sup>3</sup>* passed through said perforation and secured by the nut *c<sup>4</sup>* from removal. The portion *c'* of the

forked extension of said lever C is made with a longitudinal slot, *c<sup>2</sup>*. A grooved pulley, D, is then attached to the said portion *c'* of the forked extension by means of the bolt or shaft *d*, one end of which shaft is provided with a suitable collar, *d'*, between the wheel D and the end *c'* of the lever, said shaft passing through said slot *c<sup>2</sup>* in said extension *c'*, and the pulley D, of suitable weight, mounted on said shaft, so that the pulley forms a counterbalancing weight, and may be adjusted to any desired point on the extension *c'*, to give tension to the band E, and the nuts *d<sup>3</sup> d<sup>3</sup>* on the shaft hold the said pulley adjustably to its place.

Upon the bent end *c* of the lever C, I form a transverse perforated box, *c<sup>5</sup>*, through which passes the mandrel *f*, which mandrel extends a suitable distance beyond the lever *c* on either side. The grinding-disk F is then fitted rigidly to the mandrel *f*, on one side of the perforated box, and a sheave, G, fitted rigidly upon the mandrel, and upon the opposite side of said box, and upon the side of the lever C that driving-pulley D is mounted. The band E is then placed over the pulley D and sheave G, and the pulley adjusted upon the extension *c'*, so as to obtain the proper tension upon the band E.

Near the end *c* of lever C, and at suitable distance upon either side of said lever, I attach to the bed or table the upright standards H H. A portion of the upper ends of the standards H H are bent at right angles, as at *h*, Fig. 1, and to said ends the upper ends of depending bars J are attached by the nut-bolts *h'*. The lower ends of said depending bars J are bent at right angles and in an opposite direction to the grinding-disk. I then make a table, K, to extend from one depending bar J to an opposite bar, and place said table on the bent portion *i*, to which it is rigidly secured by the screws *k*. The outer longitudinal side of the table K is made with a rabbet, *k<sup>2</sup>*, which receives the cutter-bar of the reaper-knives. A rectangular opening is then made in the table in a central transverse relation, so as to permit the grinding-disk F to come in contact with the edges of the reaper-knives as they are moved into position opposite said opening, &c.,

I form on the depending bar J, a suitable distance above the surface of the table K, the



lugs  $l$   $l$ . A cam,  $L$ , is then made to extend from the lugs  $l$   $l$  to the table  $K$ , and attached to and between said lugs by the pivot  $l'$  and handle  $l''$ , attached to said cam, serving to throw the cam  $L$  upon the knives to be ground when placed upon the table. In the lower end of cam  $L$ , which is brought in contact with the knives, I make a suitable slot,  $l'$ , and in said slot I place a rubber block,  $l''$ . A supporting-bar,  $N$ , is then extended from one of said standards  $H$  to an opposite standard and attached to near their upper ends. A perforation is then made vertically through said supporting-bar and in the same relation through the lever  $C$ , and the bolt  $M$ , which is screw-threaded at opposite ends, introduced through said perforations in said supporting-bar  $N$ , and through said balance-lever  $C$ . A spiral spring,  $m^2$ , is placed around the rod  $M$ , between the supporting-bar  $N$  and lever  $C$ , and a thumb-screw,  $m$ , fitted to the rod  $M$  above the supporting-bar  $N$ , and a thumb-screw,  $m'$ , fitted to the opposite end of rod  $M$ , which projects below the balance-lever  $C$ .

To the center and upon the opposite side of the table having the opening  $k$ , I attach the lugs  $o$  and a short lever,  $O$ , pivoted to said lugs. To the bed or table, the proper distance away from the lever  $O$ , I attach rigidly a slotted stud,  $o^2$ , the slot being made in the direction of the lever  $O$ . I then make a bell-crank lever,  $O'$ , one end of which is pivotally attached to the lever  $O$ , and pivot said lever by the pivot  $o^3$  at the angular joint to the stud  $o^2$  and in the slot in said stud.

In the operation of my improved machine the cutter-bar holding the reaper-knives is placed upon the oscillating table  $K$  and the knives brought in regular order, so as to lie opposite the space  $k$  in said table. When said knives are adjusted, the arm  $l^3$  of cam  $L$  is brought down, and the rubber block  $l''$  comes in contact with said knives, and as friction is increased the knives are held more firmly from removal. The pulley  $D$  upon the balance-lever serves, by means of its weight, to elevate the end of the lever carrying the grinding-disk when contact with the knives is not desired, the advantage of increasing the tension of the band on the pulley being gained in addition to the counterbalancing the end of the lever carrying the disk.

Upon operating the handle  $d'$  of the pulley  $D$  rotary motion is imparted to the sheave  $G$  and the disk  $F$ . Said disk  $F$  is made in the shape of opposite truncated cones joined at their bases, the material preferred being emery. The size of disk  $F$  is proportioned to the distances between adjoining knives on the cutter-bar of a reaper. The bell-crank lever  $O'$  is operated to throw the oscillating table  $K$  toward the disk  $F$ , and the knives, when brought in contact with the disk  $F$ , are presented at any desired angle, governed by the distance in which the oscillating table and said disk are placed apart. As the knives are brought in contact with the disk  $F$ , the resist-

ance of said disk is made to vary with the tension of spring  $m^2$ , which tension is increased or lessened by the thumb-screw  $m'$ . As shown in Fig. 2, the balance-lever is operated by the handle  $c^2$ , near the end  $c$ , and the table  $K$ , provided with lugs  $k^3$  and pivoted by pivots  $k^4$  to the standard  $H'$ . In this construction the portions of the standards are removed beneath the supporting-bar  $N$ , to enable the said bar to rest directly upon the bed or table, and slots  $n^4$   $n^4$  made in said supporting-bar, to permit the forward or backward adjustment of said bar  $N$  and of the table in proper relation with the grinding-disk.

Instead of the bell-crank lever  $O'$  and lever  $O$ , to change the angle of the oscillating table, a screw bolt,  $n$ , may be attached to the support-bar  $N$ , beneath the table  $K$ , and a nut,  $n'$ , fitted thereon a plate,  $n^3$ , attached to and beneath the table  $K$ , carrying a pin,  $n^2$ , which is bent downwardly at an angle and rests upon the nut  $n'$ , whereby the table may be adjusted by simply turning the nut  $n'$ .

It will be readily seen that a driving-wheel, instead of the grooved wheel or pulley  $D$ , may be used with the band  $E$ , the periphery of the wheel being made flat, and the sheave driven by the band also made flat, if preferred.

Having fully described my invention, what I now claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-machine, the combination, with a suitable standard, of a balance-lever provided with a rotary grinding-tool at one end and a wheel adapted to counterpoise said end of lever and mounted upon said lever and upon the end opposite to that provided with the grinding-tool and in suitable power connection with said tool, and adjustable longitudinally upon said lever, as described.

2. In a grinding-machine, the combination, with a suitable standard, of a balance-lever provided with a longitudinal slot in one end, and a mandrel upon an opposite end of said lever, and a grinding-tool and a sheave upon opposite ends of said mandrel, a wheel provided with a stud or shaft, which shaft is adapted to enter and play in the longitudinal slot in said lever and be retained at adjustable points on said lever, and a band running from said wheel to said sheave on said mandrel, as and for the purpose described.

3. In a grinding-machine, the combination, with suitable standards, of a balance-lever, a mandrel upon one end of said lever, and a grinding-tool and a sheave upon opposite ends of said mandrel, a wheel mounted upon the opposite end of the balance-lever from that provided with the grinding-tool, a supporting-bar attached to opposite standards, a guide-rod, and a suitable spring arranged between said end of lever and said supporting-bar, and means for regulating the tension of said spring, substantially as described.

4. In a grinding-machine, the combination, with suitable standards, of a balance-lever, a mandrel upon one end of said lever and a



grinding-tool and a sheave upon opposite ends of said mandrel, a wheel in power connection with said sheave, mounted upon the opposite end of the balance-lever from that provided  
5 with the grinding-tool, a supporting-bar attached to opposite standards, and a suitable spring arranged between said supporting-bar and the end of the said lever having the grinding-tool, as described.  
10 5. In a grinding-machine, the combination, with a suitable lever provided with a rotary

grinding-disk and means for rotating said disk, of an oscillatory table having a suitable opening for the knives and supported on suitable standards, and a bell-crank lever pivotally  
15 attached to said table and adapted to operate as shown and described.

EPHRAIM H. FENTON.

Witnesses:

FRED. W. PERKINS,  
MARK W. THOMPSON.