

(No Model.)

2 Sheets—Sheet 1.

C. H. FOSS.
MACHINE FOR GRINDING CARDS.

No. 428,082.

Patented May 20, 1890.

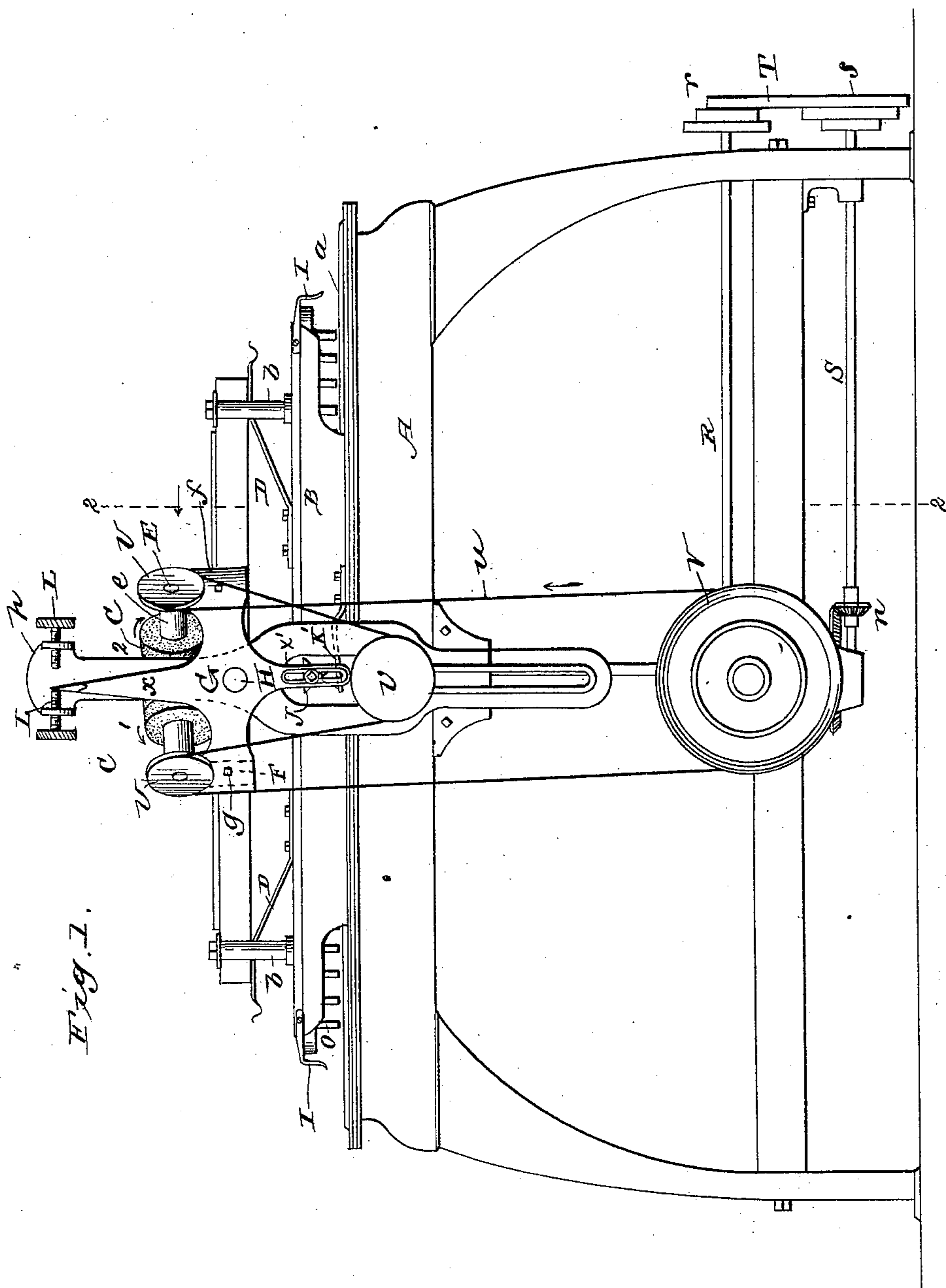


Fig. 1.

WITNESSES:

Edw. A. Smith
A. J. Cushman

INVENTOR.

Charles H. Foss
by Marcellus Bailey
his Att'y.

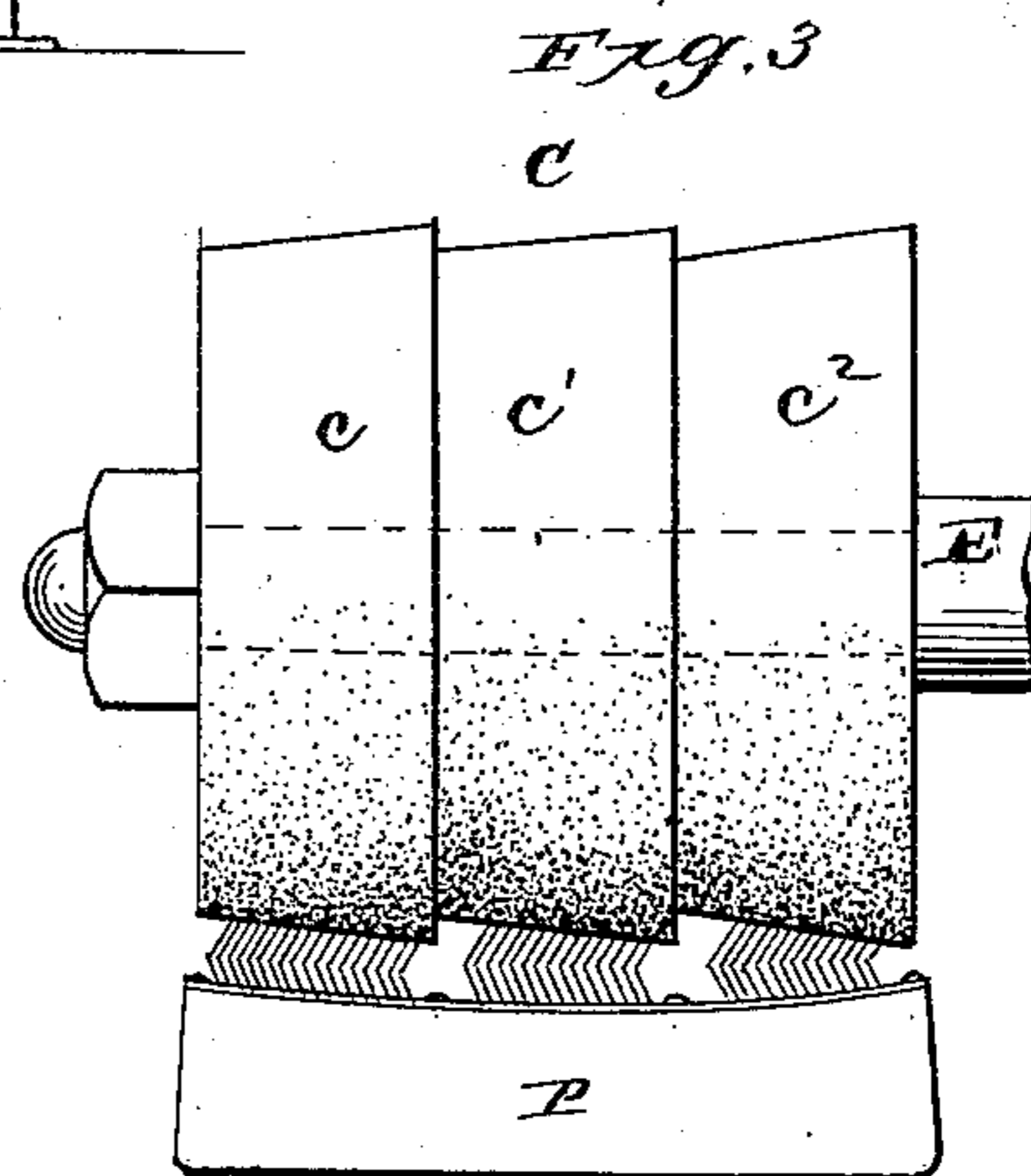
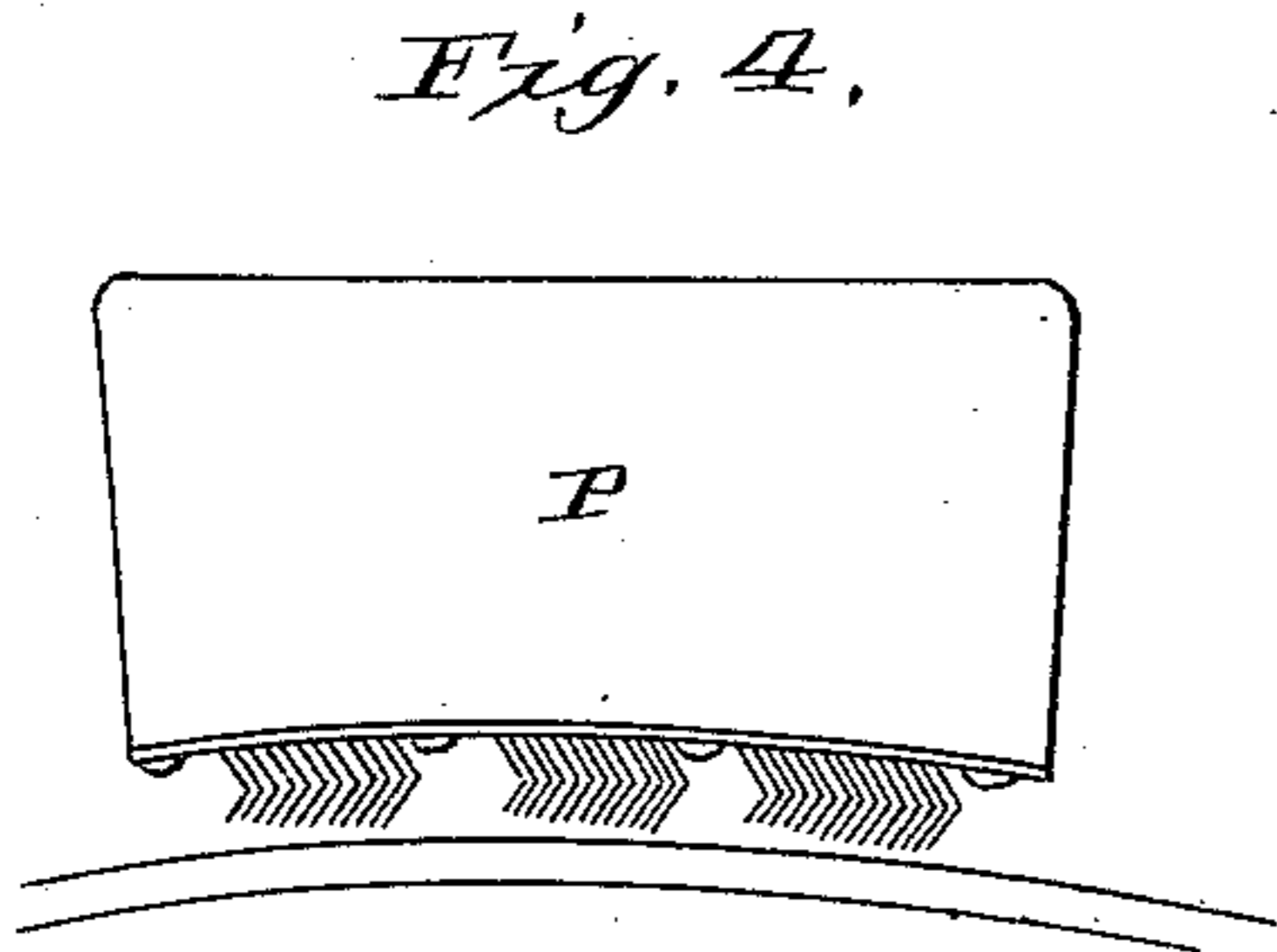
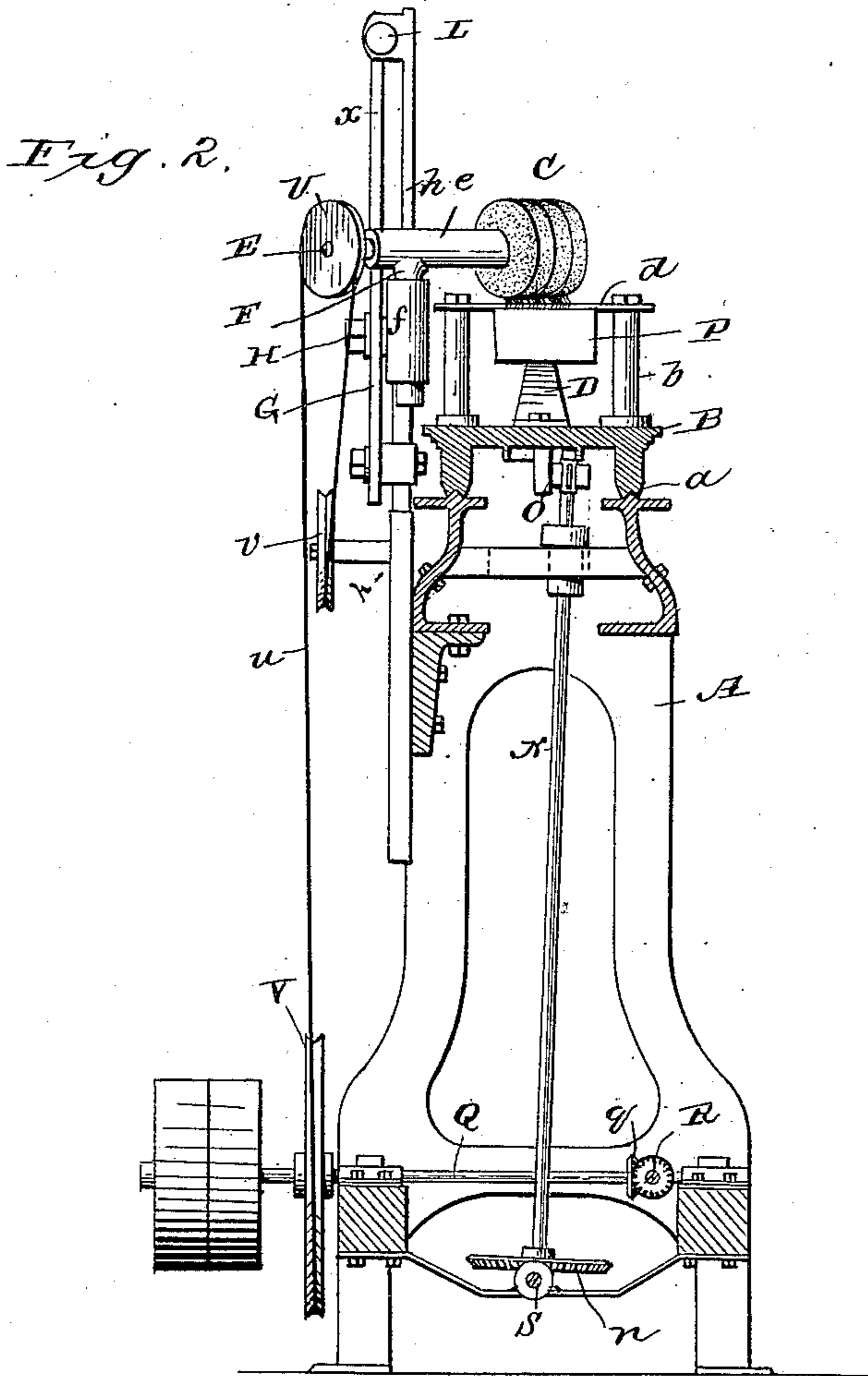
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2 Sheets—Sheet 2.

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MACHINE FOR GRINDING CARDS.

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Patented May 20, 1890.



WITNESSES:
Ewell A. Smith
H. S. Buchanan

INVENTOR,
Charles H. Foss
By H. S. Buchanan *Att'y.*

UNITED STATES PATENT OFFICE.

CHARLES H. FOSS, OF TEWSKBURY, MASSACHUSETTS.

MACHINE FOR GRINDING CARDS.

SPECIFICATION forming part of Letters Patent No. 428,082, dated May 20, 1890.

Application filed August 30, 1889. Serial No. 322,457. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FOSS, of Tewksbury, Middlesex county, State of Massachusetts, have invented certain new and useful Improvements in Machines for Grinding Cards, of which the following is a specification.

My invention has for its object to grind cards, particularly two or more beveled carding-faces upon one flat; and it consists of a machine having one or more grinders, each with different grinding-faces corresponding with the carding-faces to be produced, mounted upon a single axis and arranged and operated in the manner hereinafter described, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a machine embodying my invention. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a detached view, enlarged, of one of the grinding-wheels; and Fig. 4 is an end view of one of the carding-flats, its relation to the carding-cylinder being indicated, and the bevel of the different carding-faces being somewhat exaggerated.

The main frame-work A of the machine is provided upon its upper face with ways *a*, upon which is mounted a reciprocating bed or table B. Lengthwise upon this bed or table is supported the flat P, the carding face or faces of which are to be ground, it being preferably supported at its opposite ends upon springs D D, which press it upward and hold it against the cross-pieces *d*, which extend between the posts or uprights *b* of the reciprocating bed. The bed has imparted to it a reciprocatory motion in any desired manner—as, for instance, by the mangle rack and pinion O and shaft N. The shaft N may receive its motion from any suitable source. As shown, the main power-shaft Q is connected by bevel-gearing *q* with a shaft R, provided at its end with the belt-pulley *r*, which is connected by the belt T with the belt-pulley *s* upon the end of the shaft S, which is connected by the bevel-gearing *n* with the shaft N.

The grinders C C—two being by preference employed—are mounted upon shafts E, inclined to the path of the reciprocating bed and above the flat. The shafts of the grinders are mounted in sleeves or elongated bearings *e*, which are provided with stems F,

which in turn are mounted in tubular bearings *f* of a rocking frame G. The stems F may be turned in the bearings *f*, so as to adjust the inclination of the axes of the grinders to the path of the bed B, and then held in their adjusted positions by the set-screws *g*.

The shafts E are provided with the band-pulleys U, around which passes the band *u*, which is driven from the band-wheel V on the main shaft Q, and in its course passes the tightener-wheel *v*, which is adjustably mounted in a slot in a standard of the main frame. The course of the band *u* is such that the wheels U and the grinders are caused to turn in opposite directions.

The frame G, in which the grinders are mounted, is upon a fulcrum-pin or support H, carried by a standard *h* of the main frame-work of the machine. The frame G is free to rock upon its support H to a limited extent, the amount of its rocking motion being limited by the adjustable stops L L, between which an arm *x* of the frame extends. The relation of the frame G and grinders to the carding-face of the flat is such that when the frame is rocked to its extreme position in one direction one of the grinders is brought into grinder position and the other is carried out of working relation, and when the frame is rocked to its other extreme position the relation of the grinders is reversed. When the bed moves in the direction of the arrow, Fig. 1, the grinder (marked 1) is in contact with and grinding the card-teeth, and when the bed moves in the opposite direction the other grinder (marked 2) is brought into grinding position by shifting the frame G, the two grinders being rotated in the directions indicated by the arrows marked thereon.

As stated hereinbefore, the two axes of the grinders are arranged at angles to the line of travel of the bed. They are likewise arranged at an angle to each other as well, the reason for this arrangement being to cause the card-teeth to be ground to diamond-points.

The tipping of the frame is done automatically at the end of each reciprocation of the bed B by the dogs I, carried by the bed, and which engage with a contact-piece J, adjustably mounted in a slotted arm *x'* of the frame G. A spring K' bears against this contact-piece and holds the frame in the position to

which it has been thrown by the dog I until it is forcibly moved into its other position, the engaging-faces of the piece J and the spring K being angular, so as to insure the frame being held in one or the other of its extreme positions.

In order that I may grind the carding-face of the flat so as to have two or more beveled faces, as indicated in Fig. 4, in a somewhat exaggerated manner, I make the grinder with a number of distinct grinding-faces corresponding in number with the number of carding-faces the flat is desired to have. These grinding-faces are in shape frustums of cones, preferably of different sizes, the smallest at one end of the series and the largest at the other.

As shown in the drawings, the grinder is arranged with three inclined grinding-faces c c' c'' , mounted side by side upon the shaft E and formed of one or of separate pieces of metal, as found most desirable.

The relation of a flat, ground by a grinder such as shown in Fig. 3, to the carding-cylinder, is shown in Fig. 4, from which it will be seen that the carding-teeth on the flat are arranged in three sets or carding-faces, each succeeding set or face being nearer to the cylinder than the one before it, and that the teeth of each set or face incline toward the cylinder in the direction of movement of the latter.

Having described my improvements and the best way now known to me of carrying the same into effect, I would state in conclusion that manifestly many modifications and changes can be made in the details of construction of the various parts of the machine without departure from the principle of my invention. I do not, therefore, restrict myself to the particular details of construction hereinbefore set forth in illustration of my improvements; but

What I claim herein as new and of my own invention is as follows:

1. A rotating grinder for cards, having a plurality of separate peripheral grinding-faces in the shape of frustums of cones arranged base to point upon a common axis, substantially as hereinbefore set forth.

2. In a machine for grinding card-flats, the combination of a reciprocating bed, the grinders, the springs D, upon which the flat is placed, and the cross-pieces, against which the

flat is held by the springs, substantially as described.

3. In a card-grinding machine, the combination, with the reciprocating bed, of the two grinders, means for rotating the same, and a movable support for said grinders, whereby when the one grinder is brought into working position the other will be moved out of working position, and vice versa, substantially as set forth.

4. In a card-grinding machine, the combination, with the reciprocating bed, of two rotating grinders mounted upon axes inclined to the path of travel of the bed and inclined to each other, and means for bringing each grinder alternately into working position over the bed, substantially as set forth.

5. The combination of the reciprocating bed, the two grinders, a rocking frame in which the grinders are mounted, and means for rocking the frame to bring the grinders alternately into working position, substantially as described.

6. The combination of the reciprocating bed, the two rotating grinders, the rocking frame in which the grinders are mounted, and the contact-pieces on the bed and the rocking frame, whereby the latter is rocked as the former is reciprocated, substantially as described.

7. The combination of the reciprocating bed, the two rotating grinders, the rocking frame in which the grinders are mounted, provided with the contact-piece J and the arm x , the adjustable stops L, the dogs I on the carriage for engaging the piece J to rock the frame, and the spring K, adapted to bear upon the piece J and hold the frame in its rocked position, substantially as described.

8. The combination of the reciprocating bed, a grinder mounted on a revolving shaft, a sleeve-bearing e for the shaft, provided with a stem F, and a frame having a tubular bearing in which the said stem is adjustably held, whereby the angle of the shaft of the grinder to the path of the bed may be varied, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. H. FOSS.

Witnesses:

A. L. WRIGHT,
EFFIE E. COOK.