

(No Model.)

F. E. BOERICKE & G. GOLL,
TRITURATING MACHINE.

No. 266,756.

Patented Oct. 31, 1882.

FIG. 1.

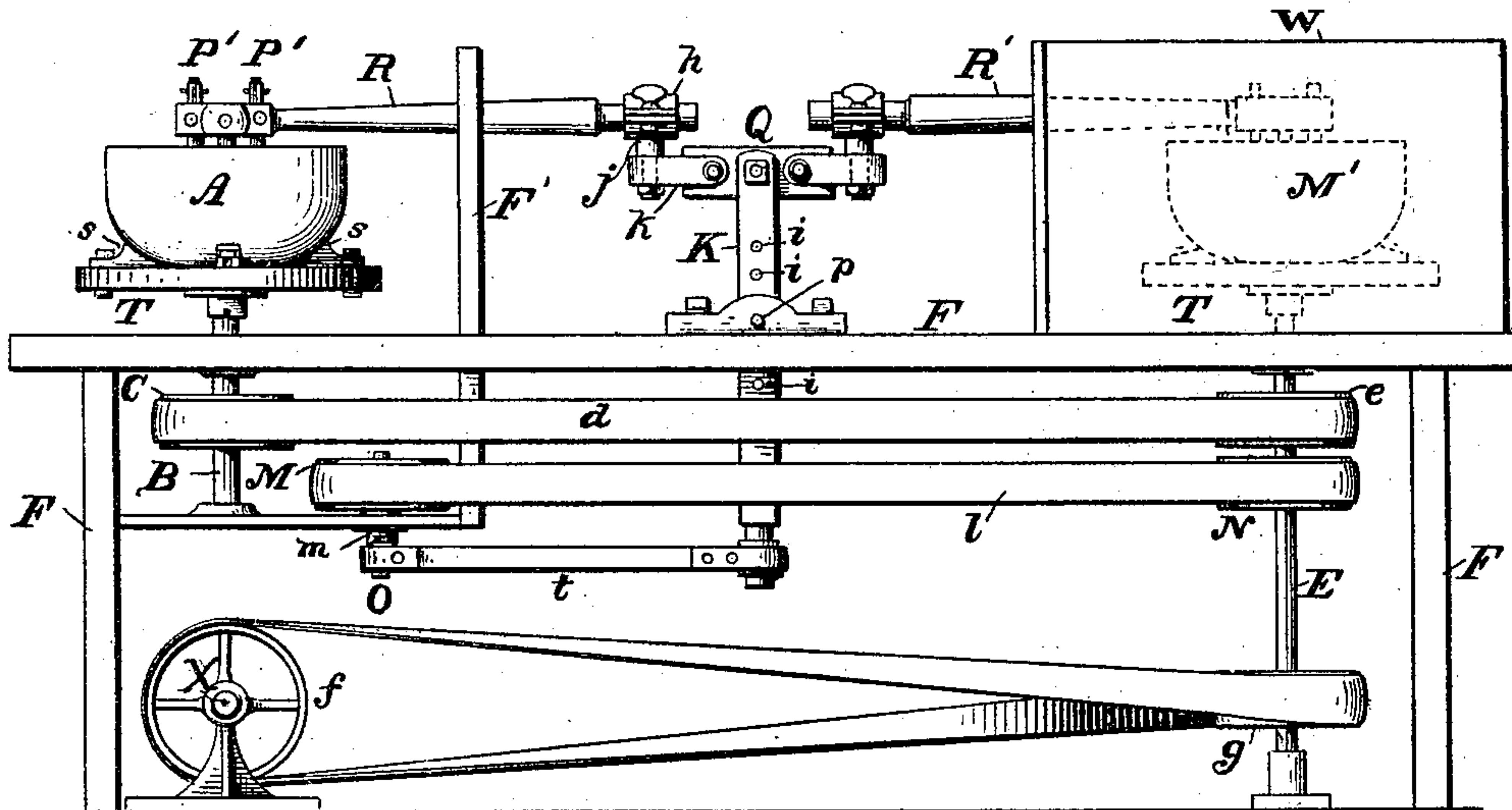


FIG. 2.

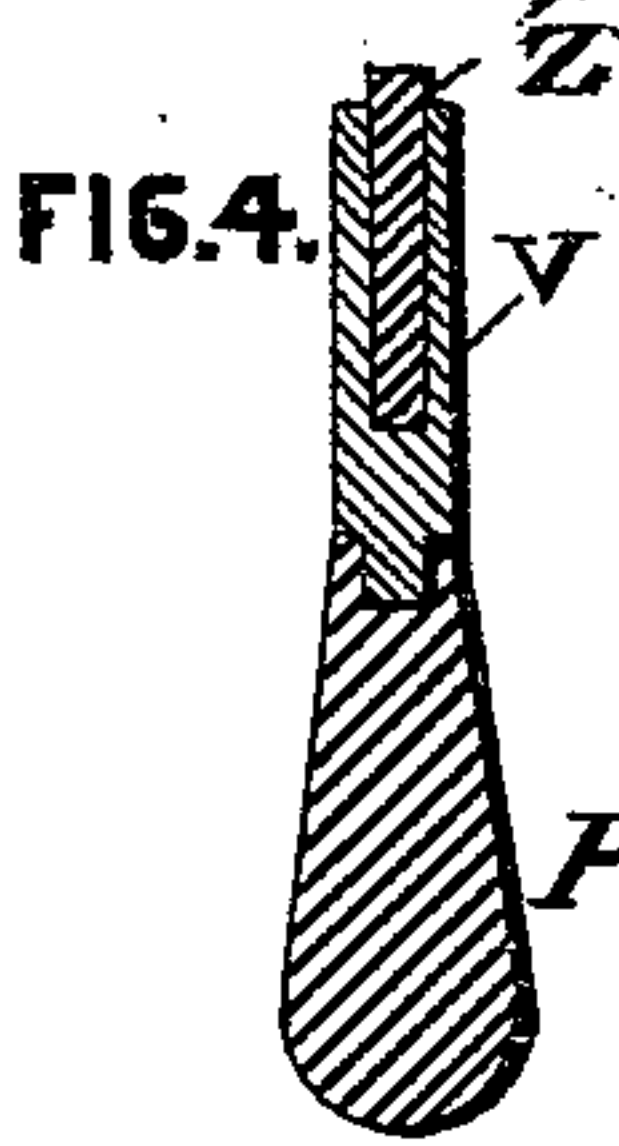
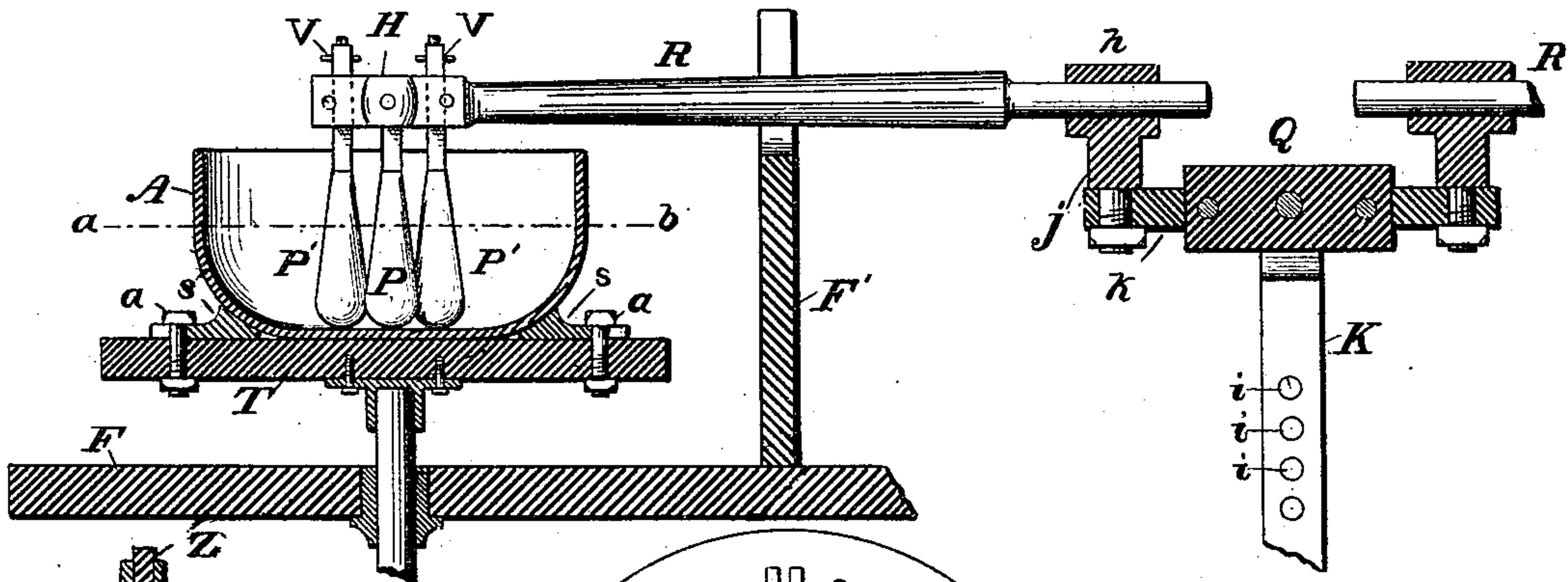


FIG. 3.

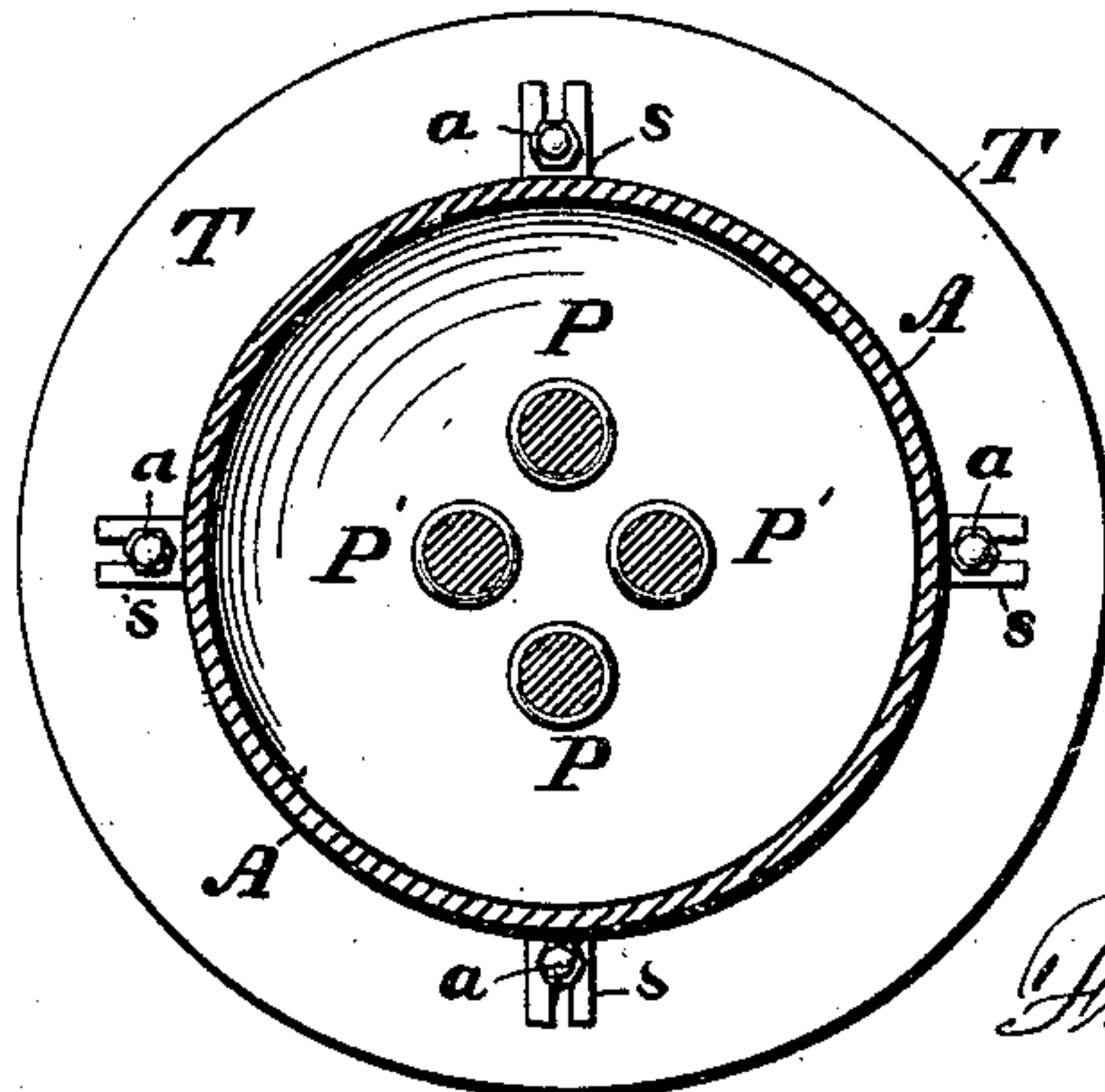
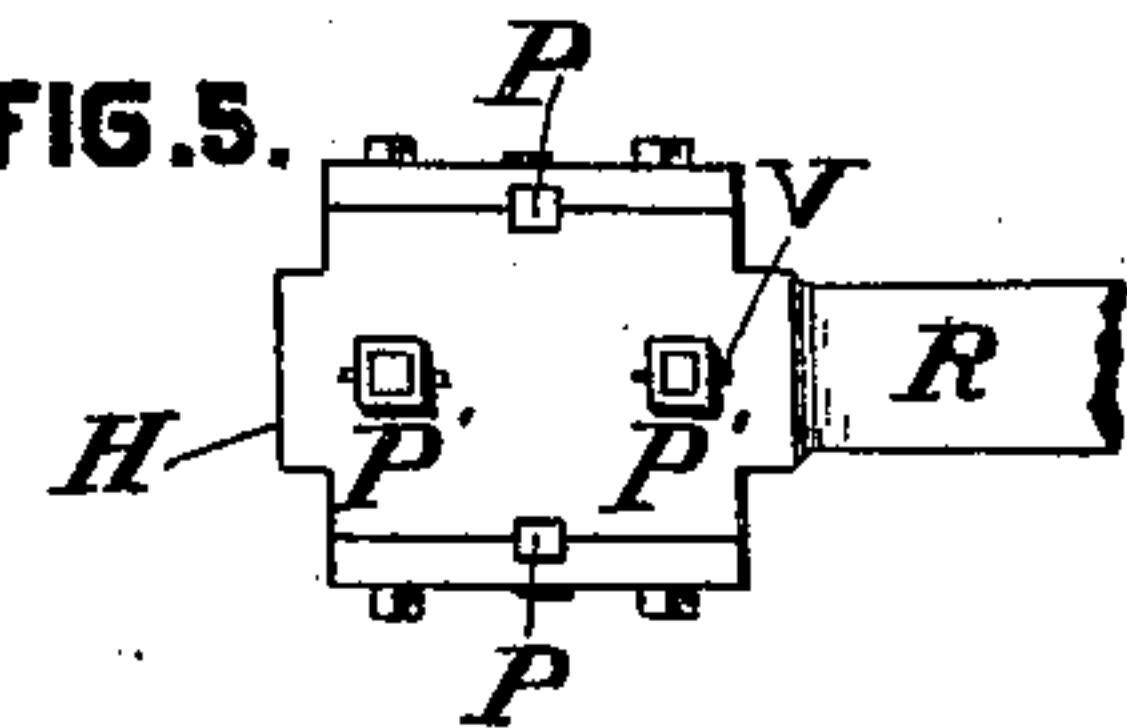


FIG. 5.



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FRANCIS E. BOERICKE AND GEORGE GOLL, OF PHILADELPHIA, PA., ASSIGN-
ORS TO SAID BOERICKE AND ADOLPH J. TAFEL, OF SAME PLACE.

TRITURATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 266,756, dated October 31, 1882.

Application filed September 26, 1882. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS E. BOERICKE and GEORGE GOLL, citizens of the United States, and residents of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Triturating-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Figure 1 is a side elevation of our invention. Fig. 2 is a partial longitudinal vertical section, enlarged, of Fig. 1, the section being made through the middle of the mortar A, and the pestles and the rod which carries them being in view. Fig. 3 is a horizontal section on the line *a b*, Fig. 2. Fig. 4 is a detail in section of a pestle. Fig. 5 is a plan view of the head of the pestle-rod.

This invention relates to that class of tritulating-machines in which the mortars are given a rotary motion and the pestles a reciprocating movement within the same.

Our improvement consists in a certain combination and arrangement of devices for producing the requisite movements, and in adjusting mechanism for adapting the movement of the pestles to suit the sizes of the different mortars; also, in the combination, with a rotating mortar, of vertically vibrating and reciprocating pestles, all as hereinafter described and claimed.

Referring to the drawings, A is a mortar or bowl of the form commonly used in tritulating-machines of the class referred to. It is supported by a table, T, to which it is secured by means of stops *s*, which are held in place by bolts or screws *a* passing through longitudinal slots in the stops, as seen in Fig. 2. In this way these stops may be adjusted to the various-sized mortars which may be used. Table T is sustained by an upright shaft, B, working in boxes in frame F of the machine. A pulley, C, upon this shaft is driven by a belt, *d*, from a pulley, *e*, upon a vertical shaft, E, which receives motion by a belt running from a pulley, *f*, of the main driving-shaft X onto a pulley, *g*.

The tritulating-pestles P P', the lower ends of which rest upon the bottom of the mortar,

as seen in Fig. 2, are secured to the free end of a rod, R, which works in the present instance in a guiding-slot in the standard F' of the frame. The other end of rod R is held by a clamp, *h*, whereby the rod may be longitudinally adjusted upon an L-shaped piece or hinge, *j*, the horizontal limb *k* of which is pivoted to a cross-piece, Q, at the top of a lever, K. The latter is pivoted upon a pin, *p*, in a lug of the frame, and is caused to vibrate in the following manner: A pulley, M, upon a vertical shaft, *m*, journaled in the frame, is driven by a belt, *l*, from pulley N upon the shaft E. The lower end of shaft *m* has a horizontal crank, *o*, which is connected with the lower arm of the lever K by a pitman, *t*. Lever K is provided with a series of holes, *i*, whereby it may be adjusted up or down by simply changing the pin *p* from one of these holes to another, and the throw of the rod which carries the pestles thereby increased or diminished as the size of the mortar or other circumstances may require.

It is obvious that by the foregoing-described combination and arrangement of mechanism at the same time that a rotary motion is imparted to the mortar A the pestles are caused to reciprocate therein, and that the relative speed of motion of the mortar and of the pestles may be made and altered, as desired, by simply changing the sizes of the pulleys.

When it is desired to take out the substance in the mortar when sufficiently trituated, or to replace one mortar by another, the rod R, being hinged to the cross-piece Q, as stated, is thrown up so as to bring the pestles entirely above the top of the mortar.

It may be observed that the shaft E, which carries the pulley *e* from which the mortar is driven, may be employed to drive another mortar, M', (shown by broken lines, see Fig. 1,) within a case or box, W, (which we ordinarily use,) and another rod, R', carrying pestles, is reciprocated from lever K, to which it is pivoted the same as rod R.

The pestles P P' are in the present instance disposed in opposite pairs at suitable distance apart. The pair P, which is in line transversely with rod R, is fixed in the head H of the latter, while the pair P', which is in line with the rod,

is each provided with a square or angular stem, V, fitting neatly, but somewhat loosely, into corresponding vertical slots in the head H, so that the pestles will be permitted to move up and down in the slots independently of each other, and cannot be frictionally rotated by the rotary motion of the mortar. If all the pestles were fixed, they would not all at any time, except when passing over the flat or even part of the bottom of the mortar, remain in contact with—that is, rub upon—the latter; but the pestles P' being allowed to move vertically as rod R reciprocates, they accommodate themselves to the curve of the mortar throughout the stroke, and the whole series of pestles always remains in contact with the bottom of the mortar. When rod R has reached the limit of its outward throw the outer vibrating pestle runs up the curving side of the mortar, and falls again gradually when the movement of the rod reverses, and when the inner one of the pair strikes the curvature of the mortar on that side it also rises and afterward falls. Thus we secure the advantages of a number of triturating-points doing continuous work during the entire reciprocation of the rod which carries the pestles. Two, as shown, or a greater number of fixed and loose pestles, may be employed for the purpose in view; but we prefer the number and arrangement above described, and shown in the drawings. In order to give sufficient weight to the vertically-movable pestles P', so that they will always press upon the mortar, we make a cavity in the stems, which we fill with lead Z or other heavy substance. (See the section Fig. 4.) All of the pestles may be made thus independently movable, in which case, however, the rod R will have to be supported, so as to keep it from falling from a horizontal position, (its head H sliding down upon the stems of the pestles.) Otherwise the stems would bind in their slots, and thereby be prevented from rising up and down independently. The relative speed which we give to the mortar and the pestles is such that at each reciprocation of the

latter they will pass or rub over different parts or lines of the bottom of the mortar.

We have referred to the hinge which connects rod R with cross-piece Q as being an L-shaped piece. We prefer to make it in two parts, as shown, the vertical part *j* being pivoted to the horizontal part *k*, so as to allow the rod R to be swung around to the right or to the left when the pestles are raised above the mortar.

Having thus described our invention, we claim as new and wish to secure by Letters Patent—

1. In a triturating-machine, the combination of the rotating mortar, the pestles, the adjustable rod, the vibrating lever K, and means for adjusting said lever vertically in order to adapt the throw of said rod to suit the different sizes of mortars, substantially as shown and described.

2. The mortar, the table T, the vertical shafts B and *m*, the pestles, rod R, the vibrating lever K, pitman *t*, a crank upon shaft *m*, the vertical shaft E, and the pulleys C M N *e*, the whole combined, arranged, and operating together substantially as and for the purposes set forth.

3. In a triturating-machine, the combination, with the rotating mortar, of the vertically-movable pestles P' and the reciprocating rod R, provided with slots or bearings for said pestles, substantially as and for the purpose stated.

4. The combination of the rotating mortar and the reciprocating rod R, provided with the fixed pestles P and the independently-movable pestles P', substantially as shown and described.

In testimony whereof we have hereunto affixed our signatures this 25th day of September, A. D. 1882.

FRANCIS E. BOERICKE.
GEORGE GOLL.

Witnesses:

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