(No Model.) 2 Sheets—Sheet 1.

F. A. HUNTINGTON.

GRINDING AND AMALGAMATING PAN.

No. 251,442. Patented Dec. 27, 1881.

Fig. 1.

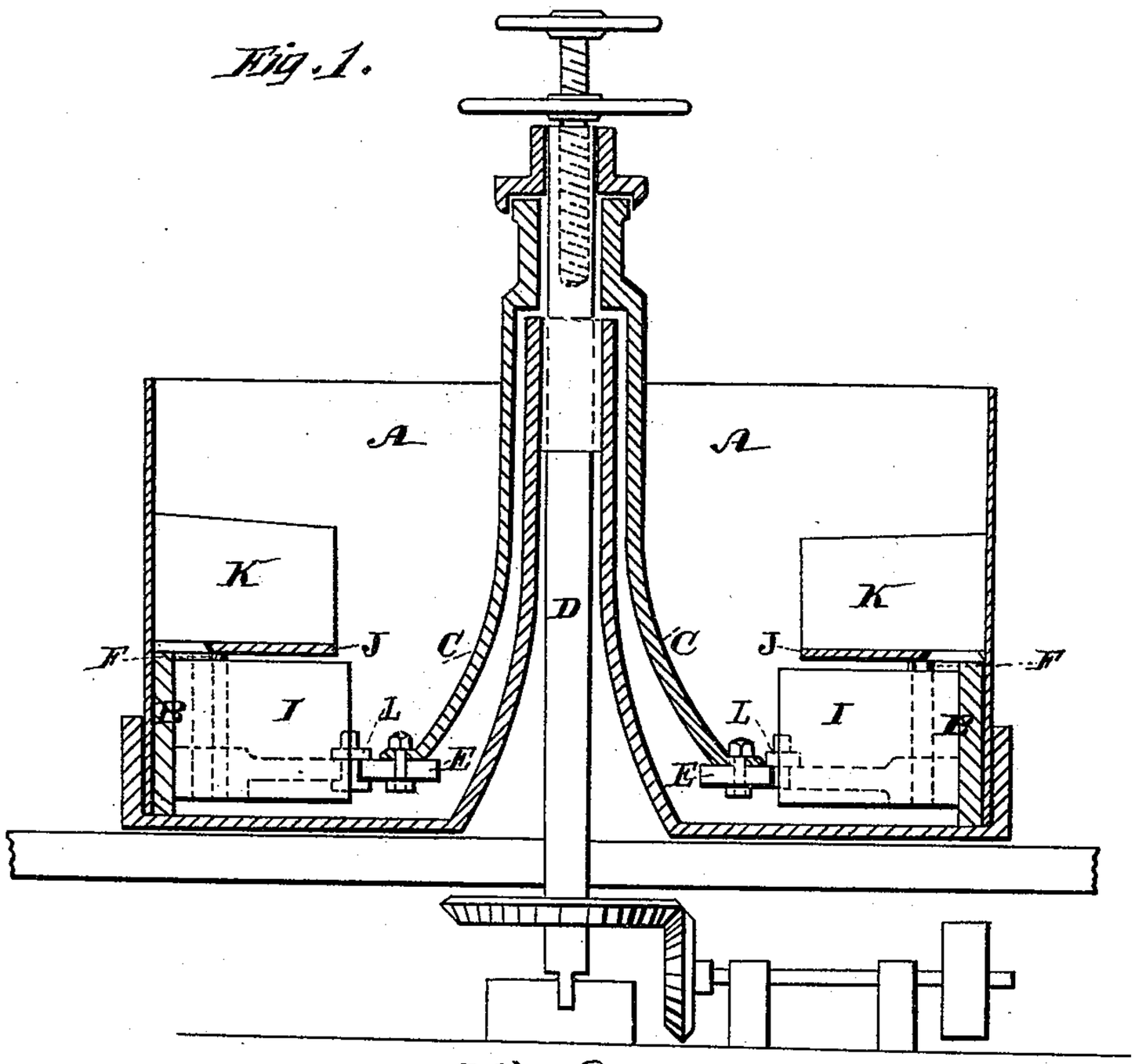
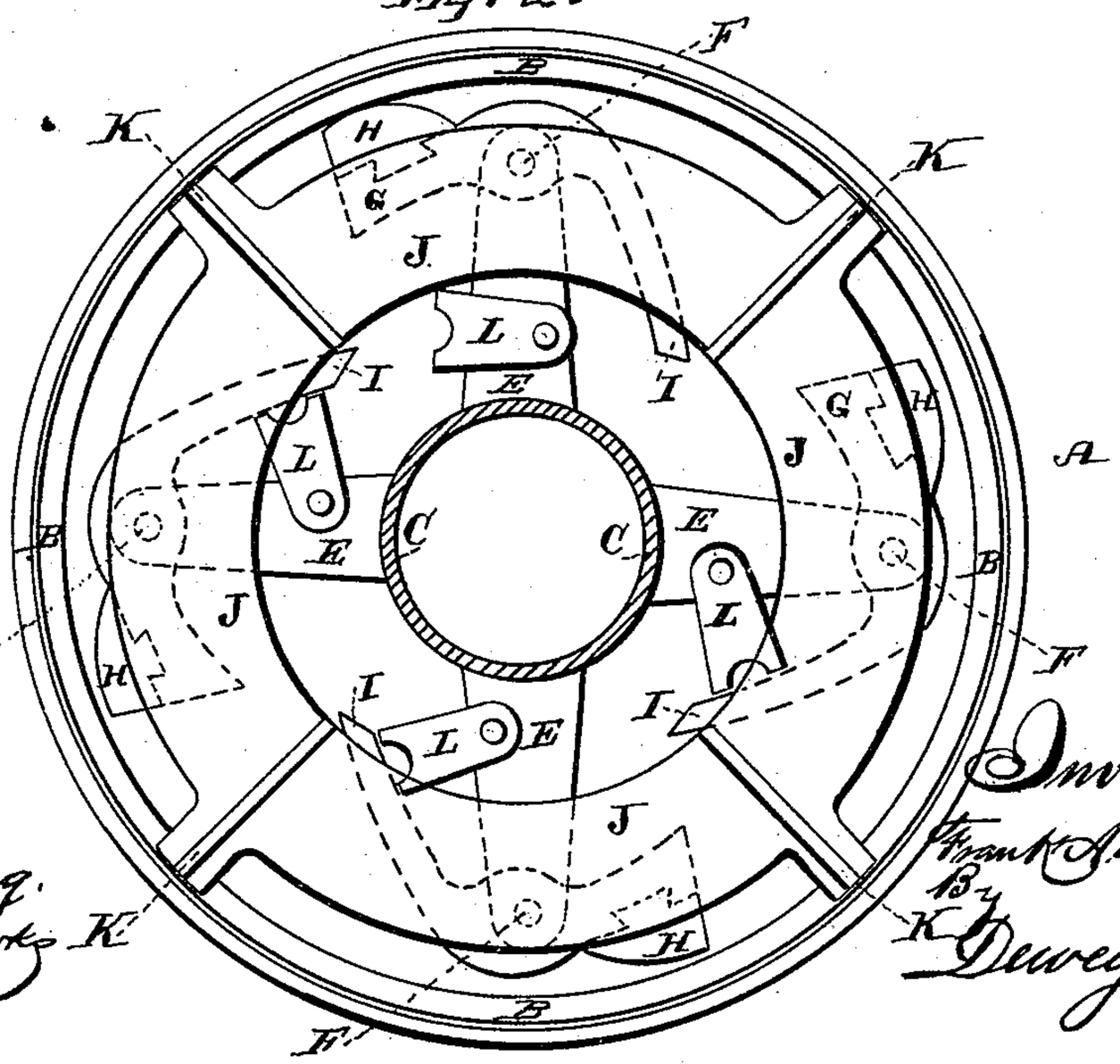


Fig. 2.



(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

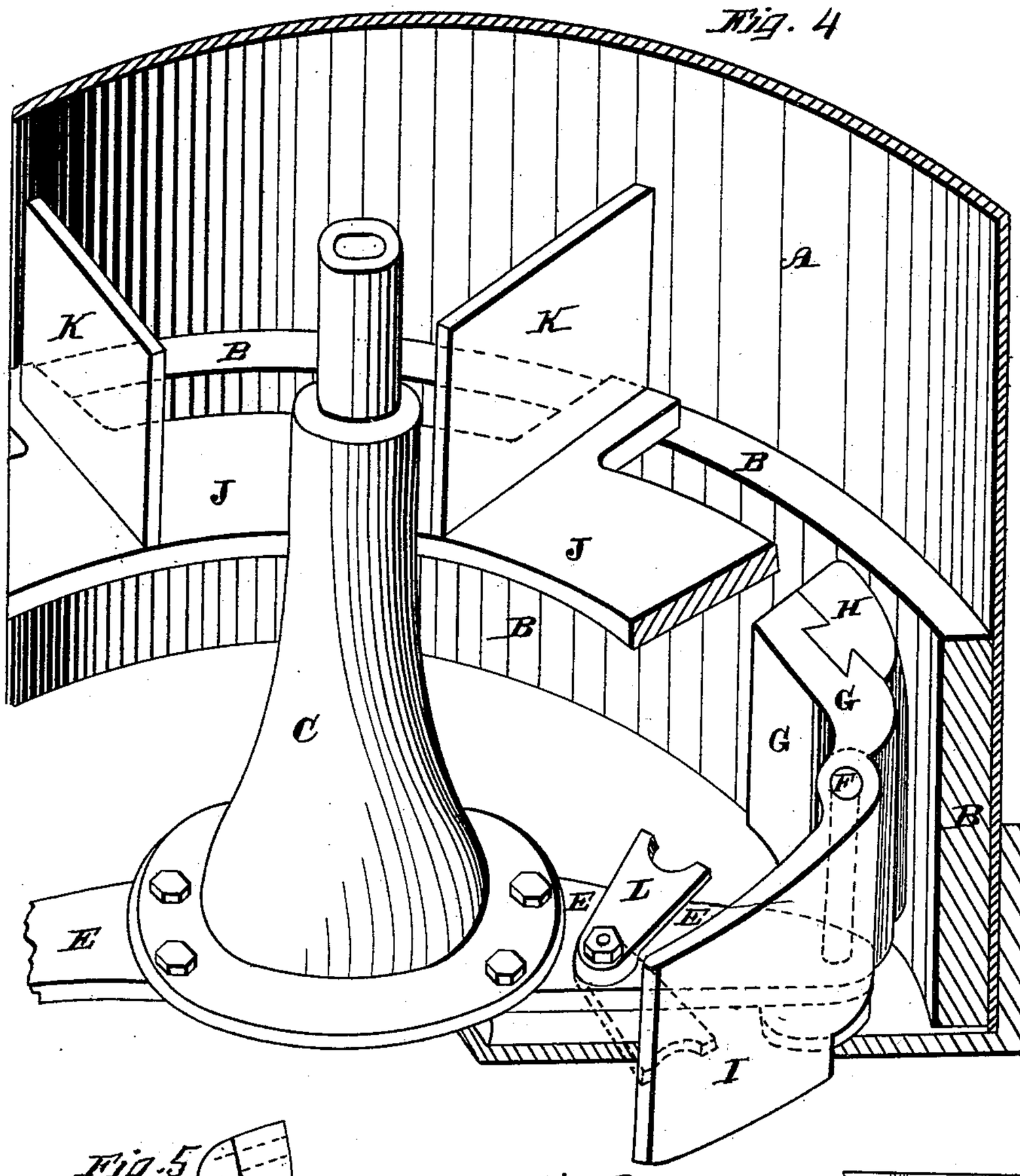

Fig. 5

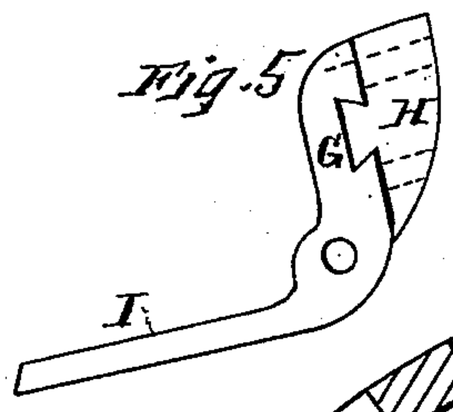

Fig. 3.

Fig. 6

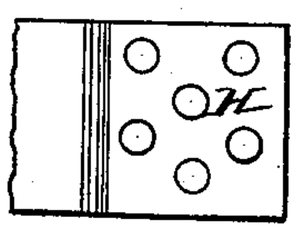

Fig. 7

Witnesses
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Frank A. Brooks

Inventor
Frank A. Huntington
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UNITED STATES PATENT OFFICE.

FRANK A. HUNTINGTON, OF SAN FRANCISCO, CALIFORNIA.

GRINDING AND AMALGAMATING PAN.

SPECIFICATION forming part of Letters Patent No. 251,442, dated December 27, 1881.

Application filed May 10, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HUNTINGTON, of the city and county of San Francisco, State of California, have invented an Improved Grinding and Amalgamating Pan; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of apparatus in which pulverized ores are treated for further reduction and amalgamation; and it consists in a novel construction of a pan having nearly or quite vertical sides, upon which are supported dies, either in sections or in the form of a complete ring, so as to receive the action of one or more shoes, which are fitted to an arm journaled upon a vertical support. When these are driven by the action of a revolving muller the shoes are thrown outwardly against the dies, both by centrifugal action and by the resistance of the contents of the pan, to wings which project inwardly from the shoe-supports. In connection with these I employ buttons or locks, by which any one or more may be swung back on their journal, and held away from the dies while amalgamating. A horizontal disk or plate, with radial wings on top, is supported above the shoes and dies, so that a circulation may be kept up.

My invention further relates to an improved construction for the shoes and dies, and certain general details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section through the center of the pan. Fig. 2 is a plan view. Fig. 3 is a view of the ring-die, showing its construction. Fig. 4 is a detail perspective view of my improved pan, partially broken away to show more clearly the internal arrangement. Figs. 5, 6, and 7 are details of the same.

A is a pan of any suitable size, and of a shape to receive the ring-die B, the inner face of which is nearly or quite vertical. This die may be made in a single piece, or in sections to suit convenience, and fits around the inner periphery of the pan.

C is a muller, which is driven by a central shaft, D, in any suitable or convenient manner. From this muller arms E project toward the circumference of the pan, and have sleeves or sockets which carry the vertical spindles F. These spindles serve to support the plates G, which carry the shoes H. These plates are bent, so that the shoes when secured to them will stand so as to present their faces fairly to the dies around the pan. These plates are carried toward the center nearly or quite radially from the spindles F, upon which they turn, and have broad vanes or wings I upon their inner ends. It will thus be seen that when the pan is filled with pulp or material, and the muller is revolved, the shoes will be thrown outwardly against the dies, partly by centrifugal action; but as the speed is not great enough to render this very effective the effective work is mostly produced by the pressure of the pulp against the inner ends of the plates or vanes I, which thus act as levers, and their power is increased proportionally with the speed of the muller. The angle of these vanes is such that they also serve to throw the pulp outwardly, so as to pass between the shoes and dies.

Above the shoes and wings is a horizontal disk, J, which extends from about the edge of the wings nearly to the outside of the pan, thus leaving openings at the center and also around its periphery. Above this disk radial vanes K project upward, and these serve to guide the material and cause it to flow to the center above the disk. The course of the current will be decided by the disk and vanes, and it will pass below the disk and by centrifugal action to the periphery of the pan; thence upward along the dies, where it will be exposed to the action of the shoes, and will then escape through the openings around the periphery of the disk and return to the center above the disk, the vanes K preventing a circular motion being imparted to it by the muller.

I prefer to construct the dies and shoes partly of iron and partly of wood, to provide a better surface for grinding. This may be done in various ways. In the present case I have shown the dies and the shoes perforated with holes, into which short blocks of wood are driven, so that the end of the grain of the wood is presented as a surface, which is about or quite level or flush with that of the iron.

In order to swing back any one or more of the shoes from the dies and prevent them from grinding, I employ an eccentric arm or button,

L, which is fixed to a stem rising to a convenient height for operation. By turning the stem the button will be caused to press against the inner end of the plate or vane I, and will thus force the shoe away from the die and prevent further grinding. This is done after the grinding is complete and while amalgamation is going on, and prevents flouring of the mercury by the continued grinding.

It will be seen that any suitable mechanical device may be employed to draw the shoes back, either separately, or they may all be moved simultaneously or, by reversing the motion of the muller the action of the pulp upon the vanes I will throw the shoes back free from the dies.

Any plate with its shoe may be lifted off its spindle without trouble when necessary.

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

1. In combination with the vertical peripheral dies B, the plates G, having shoes H, hinged or journaled upon vertical spindles upon the muller, and the inwardly-extended wings or vanes I, connected with the shoes and presenting a face to be acted upon by the material as the muller rotates, substantially as and for the purposes herein described.

2. In a grinding and amalgamating pan, the peripheral dies B, the hinged swinging plates G, with the wings or vanes I, and shoes, in combination with the horizontal disk J, with central and peripheral openings, and the stationary radial vanes or wings K, substantially as and for the purpose herein described.

3. The hinged swinging plates G, with the shoes H, and vanes I, journaled vertically upon the muller, in combination with the eccentric stops or buttons L, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

FRANK A. HUNTINGTON.

Witnesses:

S. H. NOURSE,

FRANK A. BROOKS.