2 Sheets—Sheet 1.

E. HARRISON.

Grinding Mill.

No. 85,444. Patented Dec. 29, 1868.

Fig. 1.

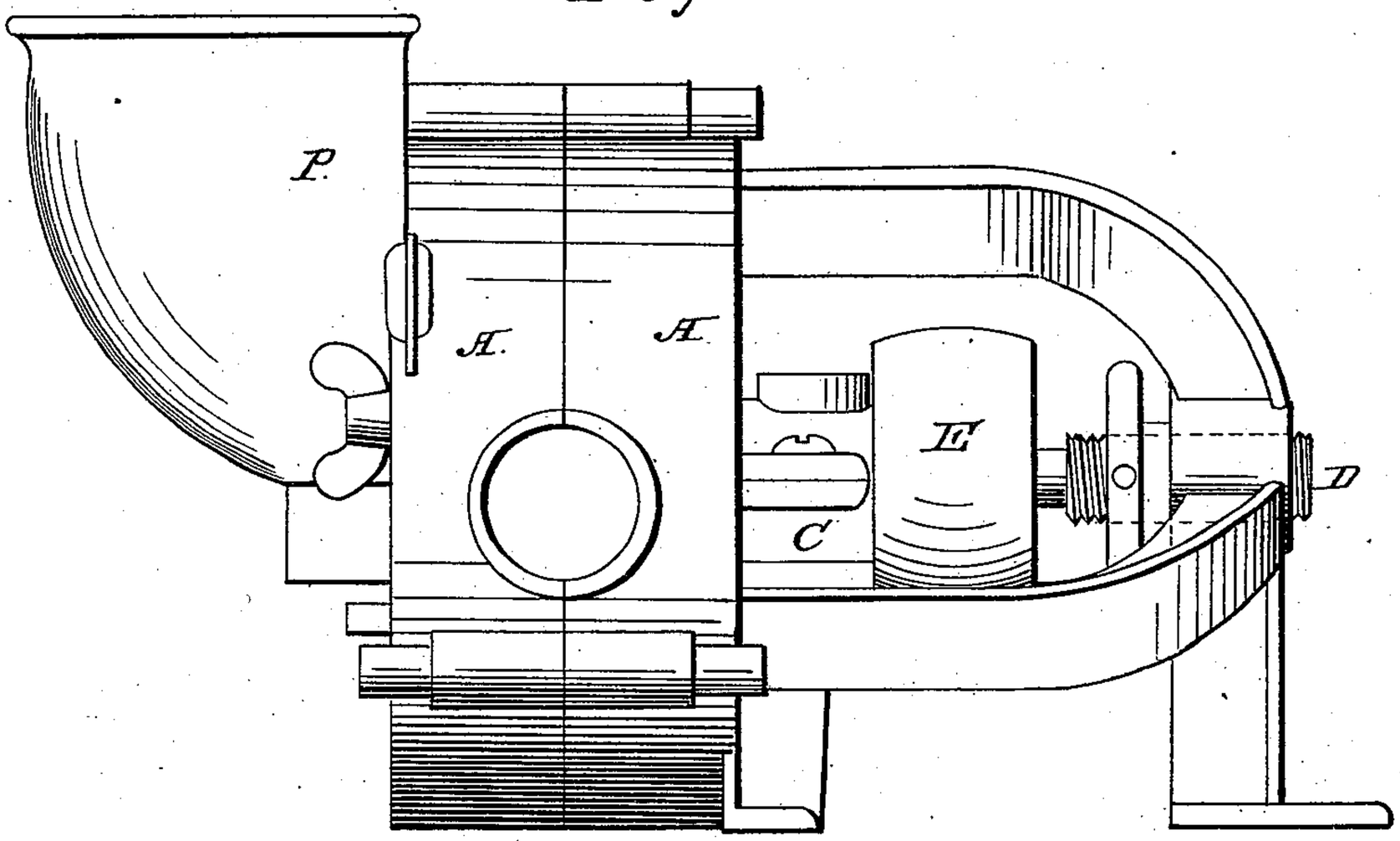
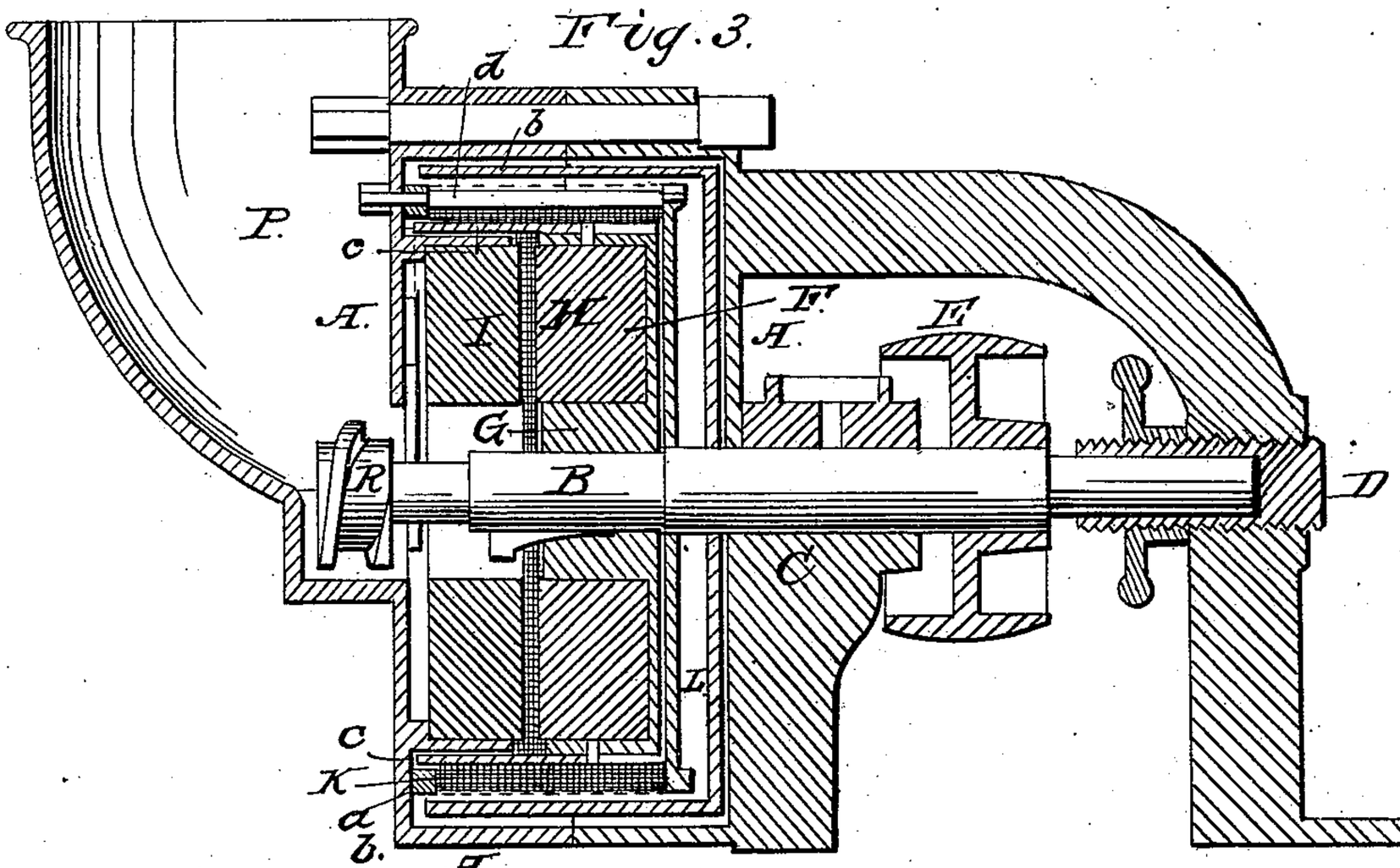


Fig. 3.



Witnesses

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2 Sheets—Sheet 2.

E. HARRISON.

Grinding Mill.

No. 85,444. Patented Dec. 29, 1868.

Fig. 2

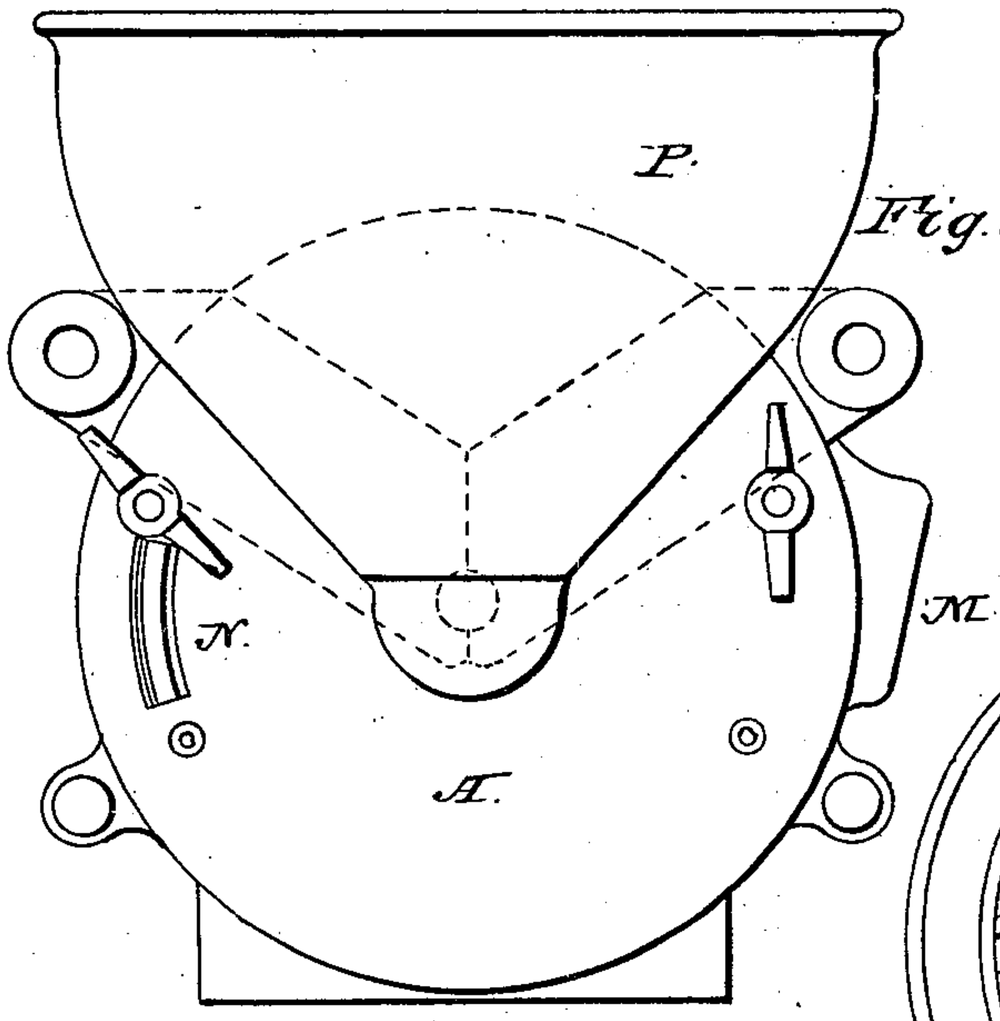


Fig. 6

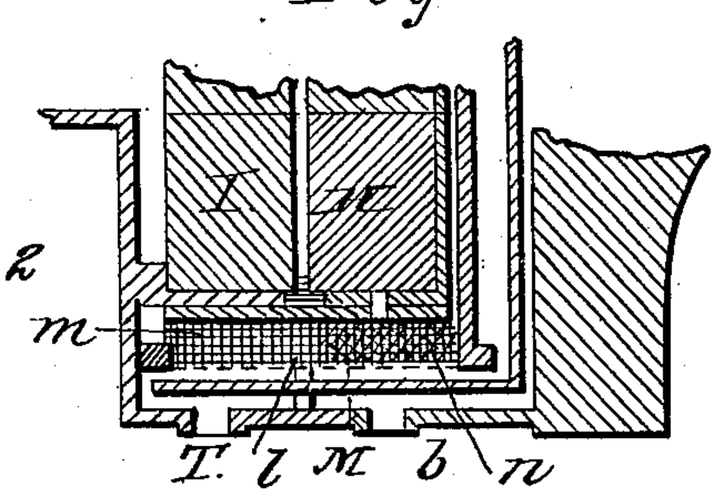


Fig. 7

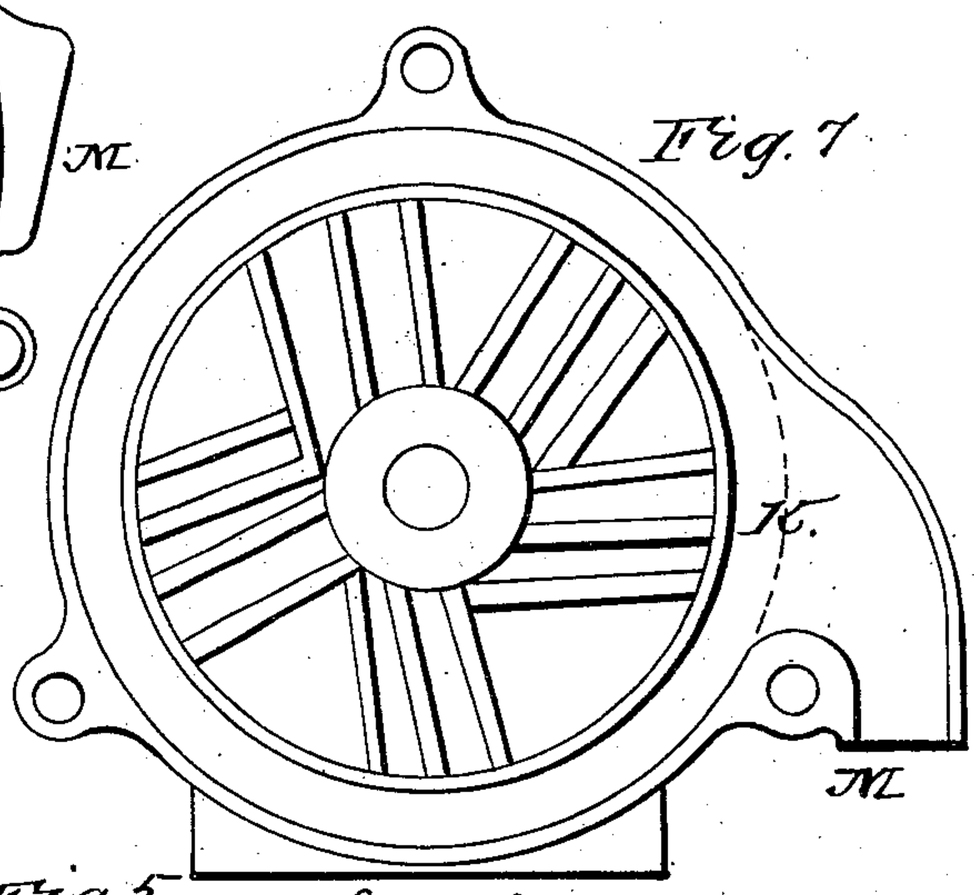


Fig. 4.

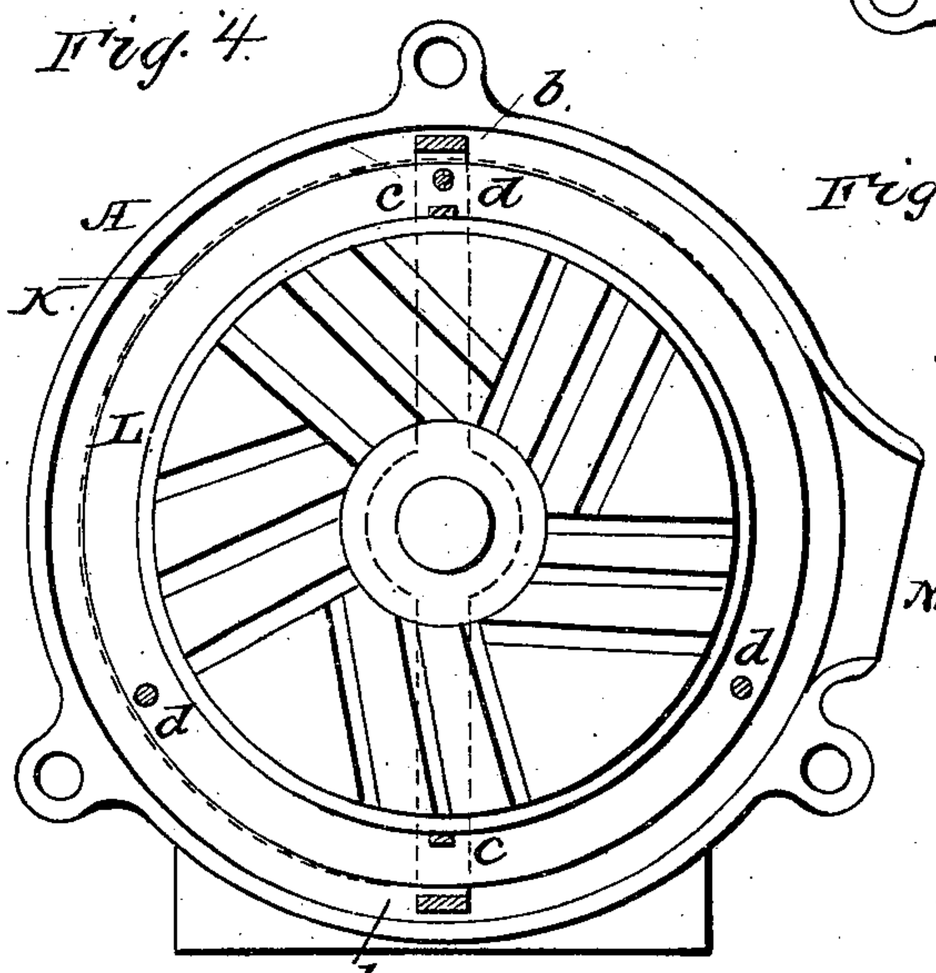
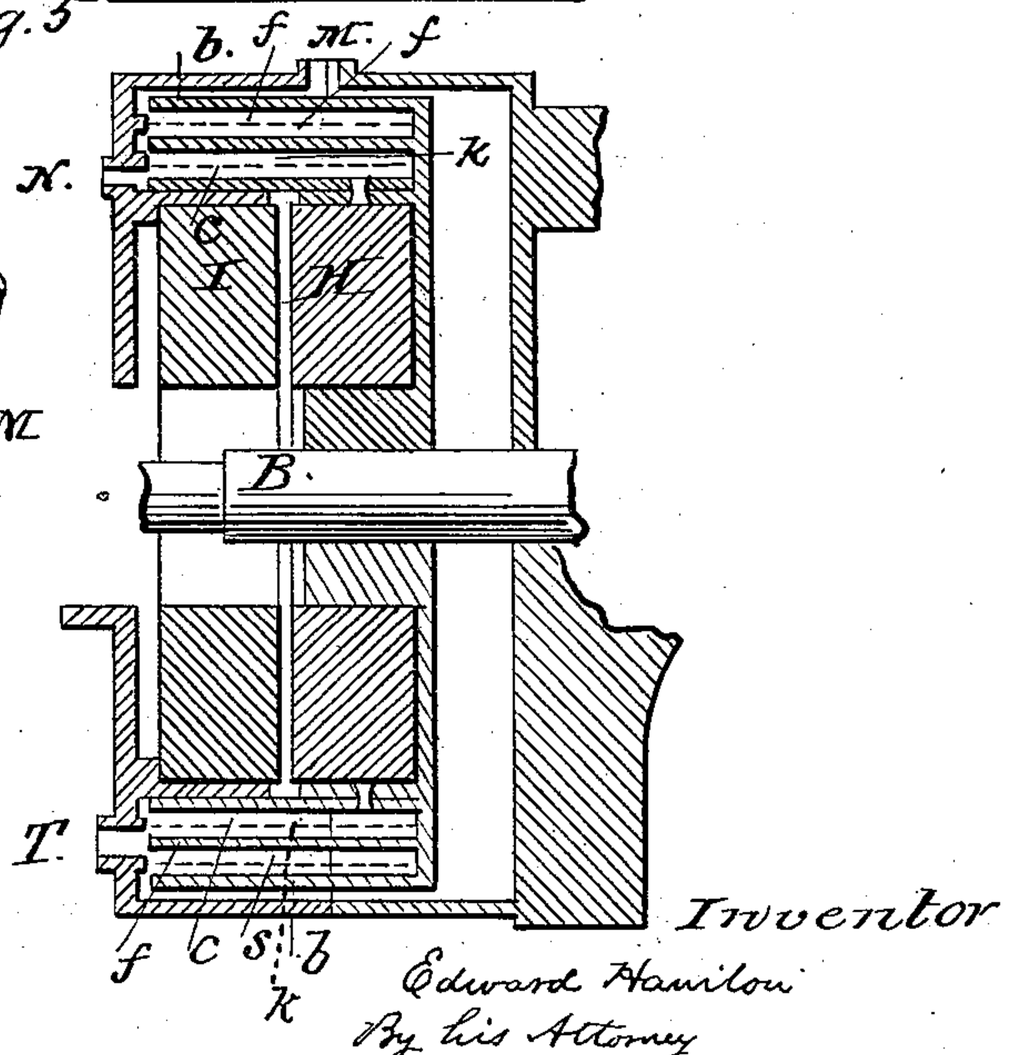


Fig. 5



Witnesses

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EDWARD HARRISON, OF NEW HAVEN, CONNECTICUT.

Letters Patent No. 85,444, *dated December* 29, 1868.

IMPROVED GRINDING-MILL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EDWARD HARRISON, of New Haven, in the county of New Haven, and State of Connecticut, have invented a new Improvement in Grinding-Mills; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view;

Figure 2, a front view;

Figure 3, a longitudinal central section;

Figure 4, a vertical section between the two stones; and in

Figures 5, 6, and 7, modifications of my invention.

This invention relates to an improvement in mills for grinding grain, specially designed for the manufacture of flour, the object being to combine with the mill-casing the bolt, so that the flour and the hulls may be discharged separately from the same mill; and

The invention consists in the arrangement of a bolt-cloth, or screen, around the stones, so that the meal, in passing from the stones, is thrown against the bolt-cloth, the fine or flour-portion passing through the cloth to one exit, while the coarse or hull-portion is driven out at another exit, separating the one entirely from the other.

To enable others to construct and use my improvement, I will fully describe the same, as illustrated in the accompanying drawings.

A is the casing of the mill, constructed in any convenient form, centrally through which passes a shaft, B, supported in a bearing, C, and in an adjustable step, D, and caused to revolve by the application of power thereto through the pulley E,

On the said shaft is fixed a plate, F, with a hub, G, so as to receive and carry the runner-stone H, and in a position corresponding to the runner-stone H, the bed-stone I is arranged within the case, as seen in fig. 3.

Within the case, between the stones and case, and surrounding the stones, I place a cylinder, K, of bolt-cloth, as seen in figs. 3 and 4, supported in the case so that the runner-stone will revolve freely within the fixed bolt-cloth, as seen in fig. 3, the bolt-cloth secured to a fixed plate, L, upon one side, and by a ring, *a*, upon the other edge, and these secured by bolts, *d*.

To the edge of the runner-stone casing, or plate F, are fixed sweeps, *c*, more or less in number, (by preference, two,) which, as the runner-stone revolves, sweep around between the bed-stone and bolt-cloth; and to the shaft, I fix other sweeps, *b*, as seen in figs. 3 and 4, so as to revolve in the space between the bolt-cloth and the inner surface of the casing, in close proximity to the bolt-cloth.

M is the outlet from the casing outside the bolt-cloth. (See fig. 4.)

N is the outlet between the bolt-cloth and the stone, as seen in fig. 2.

P is the hopper, into which the grain is placed, opening through the bed-stone I, as seen in fig. 3.

At the said opening is arranged a worm, R, fixed to the shaft B, and so as to revolve therewith, which, revolving in the mass of grain at the entrance to the mill, draws the grain into the mill to be ground.

The runner-stone in motion, the grain is drawn between the stones, in the usual manner, passing out between the stones, as fast as ground, and, by the centrifugal force of the revolving stone, the meal is thrown against the bolt-cloth, and the sweeps *c* serve to keep the meal in agitation between the bolt-cloth and the stones, and this, by the rapid revolution of the stones, forces the finer portion or flour through the bolt-cloth, which is brushed or swept from the bolt-cloth by other sweeps, *b*, and by the said sweeps *b* the flour is forced out through the opening M, while the coarser portion, which cannot pass through the bolt-cloth, is forced, by the sweep *c*, out through the opening N between the bolt-cloth and the stones.

The sweeps are inclined, upon their advancing edge, towards the outlet N, which facilitates the passage of the coarser portion to that side of the mill, and, consequently, out from the mill.

The casing of the mill, the driving and adjustment of the stones, are such as are in use, and have been long manufactured and known to the trade as the Harrison mill.

The position of the outlets M and N may be varied, as it is not essential at which point around the mill they are placed.

It is often desirable, in grinding wheat, to produce two qualities or grades of flour, which is accomplished by the use of two bolt-cloths, of different meshes.

In fig. 5, I illustrate my arrangement for producing two grades of flour.

The different parts of the mill are represented by the same letters, but, in addition to the bolt-cloth K, I place between that and the case, a second bolt-cloth, S, also making an additional outlet, T, between the two bolt-cloths, the outer cloth S being of a finer mesh than the inner; and I also arrange an additional sweep, *f*, between the two cloths.

By this arrangement, that portion of flour which will pass the first bolt-cloth, enters the space between the two bolt-cloths, and is there separated, the finer portion passing through the cloth S, while the coarser portion passes through the outlet T.

Other bolt-cloths, for further grading of the flour, may be added in like manner.

In fig. 6, I show a different modification for producing different grades of flour.

I employ, as in the first instance, a single bolt-cloth, but of two different meshes, *m* and *n*, *n* being the finer, and I form a ring or partition, *l*, around the space be-

tween the bolt-cloth and casing, so that the portion of flour which passes through one bolt-cloth, cannot enter into the chamber where the flour from the other chamber passes, and I form a separate outlet, M and T, for the separate spaces; therefore, only the finest portion of the flour will pass through the part *n*, while the coarser will pass out through the part *m* of the bolt-cloth, and each quality through its respective outlet, the bran passing out separated, as before.

I have thus far represented the bolt-cloths as arranged entirely around the stones, and have also represented the sweeps as being fixed within the case to the shaft. It will, however, be readily seen that the bolt-cloth need not extend entirely around, as a portion of the cylinder may be of solid material, the flour only passing out of the perforated or cloth-portion of the cylinder; and it will also be readily seen that the sweeps may be detached from and driven independent of the shaft, by arranging a plate, ring, or wheel, within the case, with projecting arms, to act as sweeps, and communicating power to the said plate from outside the cylinder.

In fig. 7, I show a still different modification or arrangement of the bolt-cloth. In this, the bolt-cloth K is simply placed over the outlet from the casing. This arrangement serves a good purpose when it is not desirable to entirely separate the flour from the hulls.

In this construction, the grain, when ground, is thrown against the cloth K, the finest portion of which will pass through, and escape at the outlet M, while the coarser portion will escape at another outlet, with the hulls or bran, thus, in the same mill, producing both meal and flour.

I have thus succeeded in producing a mill of very little enlarged dimensions, which combines within itself both a grinding and bolting-apparatus—an advantage over other mills and bolting-apparatus, which is too apparent to require that more be said in explanation.

I do not claim the arrangement of a bolt-cloth upon the stones of a grinding-mill, as such, I am aware, is not new.

Having thus fully described my invention,

What I claim as new and useful, and desire to secure by Letters Patent, is—

The arrangement, with the casing which encloses the stones, of one or more bolt-cloths, so as to separate the finer from the coarser portion of meal within the casing of the mill, substantially as set forth.

EDWARD HARRISON.

Witnesses:

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A. J. TIBBITS.