J. M. CLARK.

Flour Mill.

No. 26,751. Patented Jan'y 10, 1860.

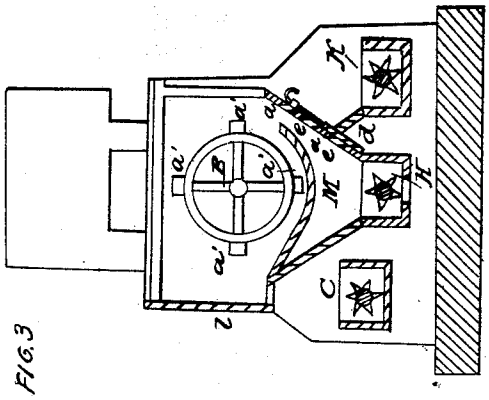

FIG. 3

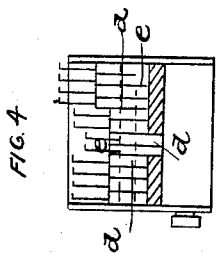

FIG. 4

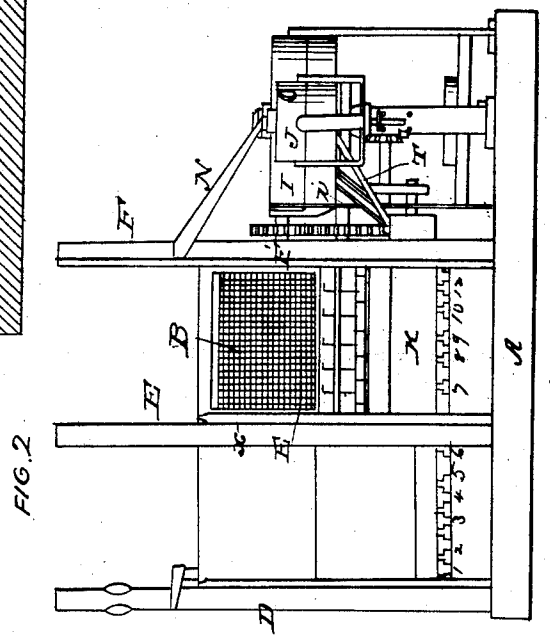

FIG. 2

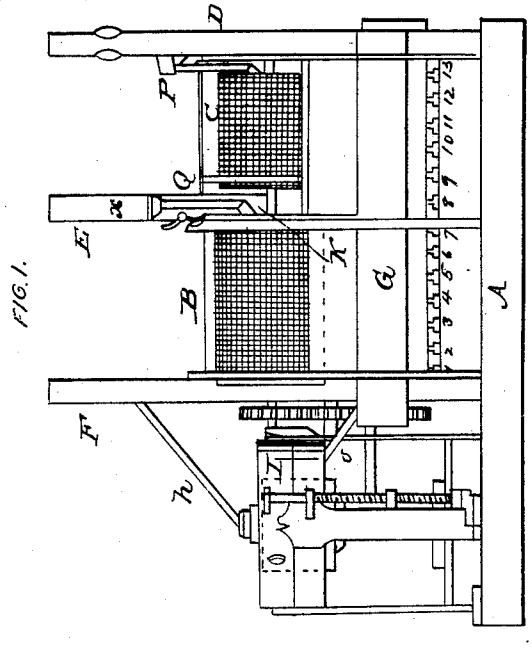

FIG. 1

UNITED STATES PATENT OFFICE.

JAMES M. CLARK, OF PHILADELPHIA, PENNSYLVANIA.

FLOUR-MILL.

Specification of Letters Patent No. 26,751, dated January 10, 1860.

To all whom it may concern:

Be it known that I, JAMES M. CLARK, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Flour-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the characters of reference marked thereon.

The nature of my invention consists in the combination of a main grinding and a regrinding mill with two or more bolts and of a series of valves and apertures as hereinafter described.

Figure 1 represents a side elevation showing the two bolting cloths exposed. Fig. 2, is a view of opposite side of the apparatus, only one bolting cloth exposed. Fig. 3 is a cross section through the front bolting cloth and through the three conveyers. Fig. 4 is a view representing the system of side valves which regulate the flow of the different qualities of flour, &c.

In the figures A represents the base, on which is elevated the bolting chest L, L, said chest being provided with a conveying bottom as shown in Fig. 3. Within the bolting chest are placed two bolting reels, on one and the same shaft, and both the chest and the reels are divided by means of a partition at or near the center of the chest.

D, E, F, represent the three elevators D, and F, being placed at each end of the bolting chest with the center elevator E, near the center of chest. One trunk x, of elevator E, passes up through the chest L while the other trunk x', is outside of the chest.

P represents the spout which leads down from the elevator D into the rear bolting reel C, and Q, represents a spout which leads from the elevator E, into the front bolting reel B.

G, represents a long conveyer, which carries the ground material from the main grinding mill where it is first ground back to the elevator D.

H, (in Fig. 3) represents a conveyer, which is situated under the conveying bottom of the bolting chest and extending its entire length; said conveyer being provided with apertures and slides as seen in Fig. 1, and marked 1, 2, 3, 4, 5, 6, &c., for the purpose of drawing any portion of the bolted material which may fall into said conveyer if desired.

K represents a short conveyer, which is for the purpose of conveying the material which has been reground in the grinding mill J, to the elevator E, from whence it is carried into the front bolting reel B, Fig. 1.

I, and J, represent two grinding mills I, being the large mill in which the grain is ground before bolting, and J, a small regrinding mill which is used for the purpose of regrinding the fine flour, middlings, shorts, ship stuff and bran, or any portion or either of them which may require regrinding and which reground material is never allowed to pass into the bolt C, when the double extra and extra flour is made as it comes directly from the main grinding mill.

a, Fig. 3, represents one of the converging sides of the bottom of the chest which side a, is provided with apertures e and e'. The aperture e, leads into the conveyer K, extending the distance from bolt head F', to bolt head E. The aperture e', allows the material or any portion of it to pass out between the conveyer H and K, as rejected.

In Figs. 3 and 4, d represents a slide valve, or, a series of slide valves, which are made without apertures (of any proper material) and are long enough to cover both apertures e, and e', at the same time. By sliding up these valves, I cover the apertures and by pushing down the valve d, I cover the aperture e', or by drawing the valve so that its upper end just covers the upper aperture, I close both apertures at the same time by the valve d.

The bolt C being too fine to allow coarser materials than the extra flour to pass through it, these materials are caused to pass out at the end of the bolt reel C', and thence to the elevator, E, and up said elevator and emptied into spout Q, through which it passes, to bolt B. The fine, the superfine flour, middlings, shorts, ship stuff, and bran, pass through this bolt, and fall on the circular bottom M. Beginning at the head of the bolt, B, the grades are first superfine, fine, middlings, shorts, ship stuff, and bran. As the reel revolves, the scrapers a', carry the material on bottom M, forward to the opening between said bottom, and inclined side a, of bolt chest, as seen in Fig. 3. The valves d, being closed at the head of the bolt B, the superfine flour, passes down the side of the chest, into conveyer H, from which it is drawn off at valves, 1 and 2. The next

valves *d*, *d*, being opened allow the fine flour to pass into the conveyer K, from it to and up elevator E, down spout Q, into bolt B, where it is rebolted and refined as superfine flour. The slide valves, *d*, next to and near the tail of the bolt being closed, the middlings pass down into conveyer, H, and are carried along it into the elevator F, up said elevator to spout *h*, down said spout to the regrinding mill J, where it is all reground and passes through spout P, into conveyer K, by which it is carried to elevator E, up said elevator and emptied into bolt B, again where it is rebolted and refined with the qualities being bolted and yields superfine and fine flour, and falling down, as before, is drawn off at valves 1, and 2. The shorts ship stuff and bran, when required to be reground can also be sent back to the regrinding mill in the same manner and by the same means and at the same time as the middlings; so, too can the fine flour, middlings, shorts, ship stuff and bran, or either or any portion or quality of either of them; so also can any quality or quantity of these different grades by means of the valves *d*, be rebolted without regrinding if desired.

In the construction of my valves *d*, I can make a more perfect valve, with much less expense, as I do not cut holes through them which is as expensive as to make my valves, and those valves with holes are not so perfect in their operation as mine are, for it will be seen that on each side of a hole there is left standing a portion of the valve which will catch the falling material on it and carry it to the wrong place, but in the case of my valves, there is no side left and at each moving of the valve all the material that is to fall is removed with it, and there can be no mixture of the different qualities; further, I by one valve can shut one aperture at a time, either the upper one *e*, or the lower *e'*, or, at pleasure I can close both by the same valves, or I can alternate the valves *d*, so as to have when desired both the apertures closed, or both opened at either end of the inclined side or I can have some of them opening the upper aperture, and others the lower one, thus at will so alternating them as to accomplish the end desired, the whole being under the control of the miller. By means of the arrangement of my apertures and valves, *d*, I am enabled to dispense with spouts which thus saves much expense.

It will be seen that the regrinding mill J, is so arranged in reference to the main grinding mill I, bolt B, elevator F, and other parts of my machinery that it derives its motion by gearing direct from the spindle of the main grinding mill, and thereby diminishes the cost of the mill and renders the operation and construction simple and brings the whole in a very compact form.

The spout, *i*, is used simply for the convenience of examination of the materials in the grinding mill to ascertain if the grinding is going on properly.

I do not claim grinding and regrinding upon separate mills as that has long been known, but

What I do claim is—

1. The arrangement of the center elevator E, one trunk of which passes into the bolt chest; and when so arranged, the combination of said elevator with the bolts B, and C, and conveyer K, as set forth.

2. Also, I claim one continuous bolt chest, L, containing two separate reels, placed in a line or end to end, in combination with the center elevator E, as set forth.

JAMES M. CLARK.

Witnesses:
C. M. ALEXANDER,
C. W. FRANZONI.