

G. T. SMITH.
Middlings-Purifiers.

No. 158,992.

Patented Jan. 19, 1875.

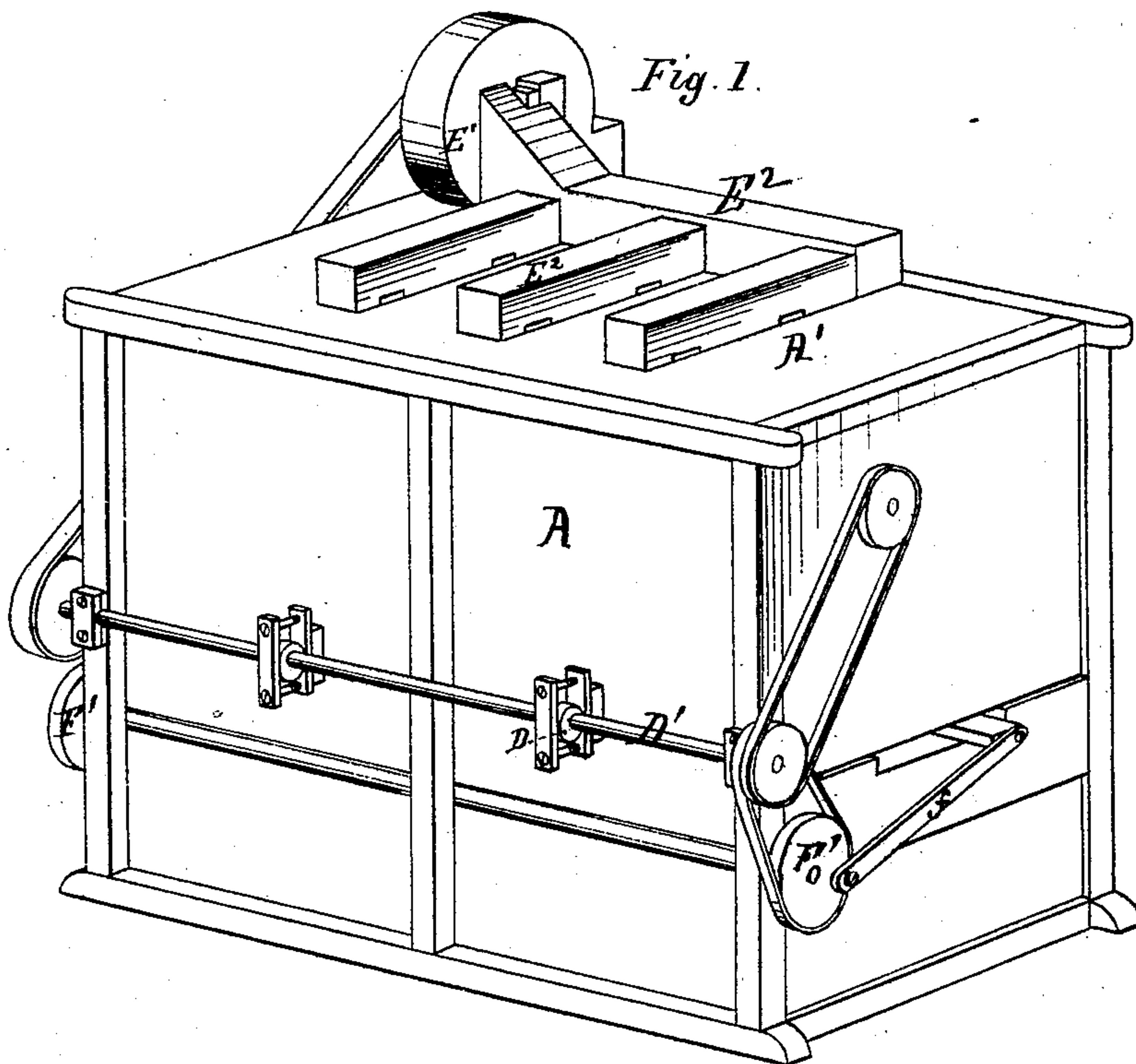
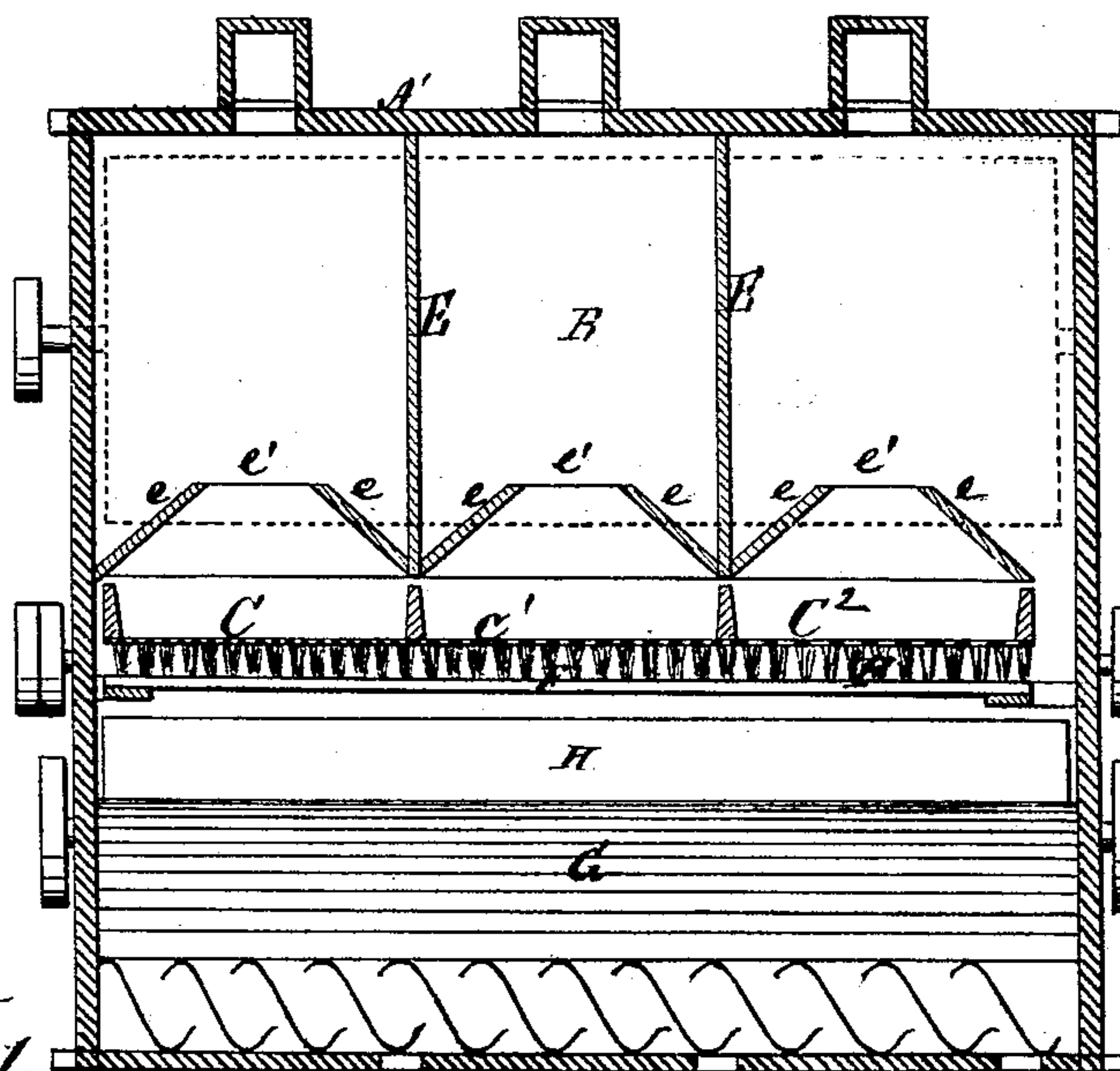


Fig. 4



Witnesses.

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H. H. Doubleday

Inventor.

Geo. T. Smith
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Fig. 2.

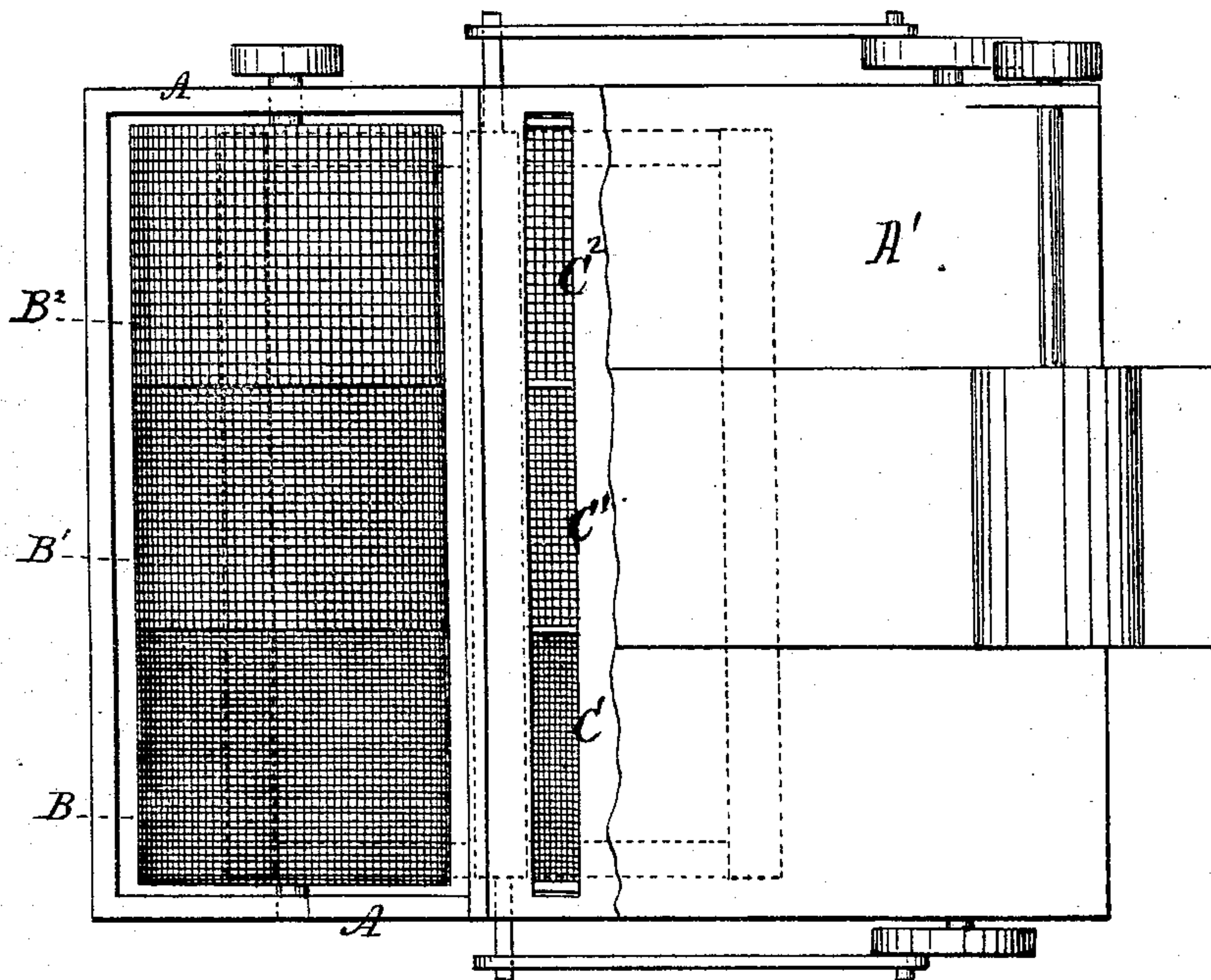
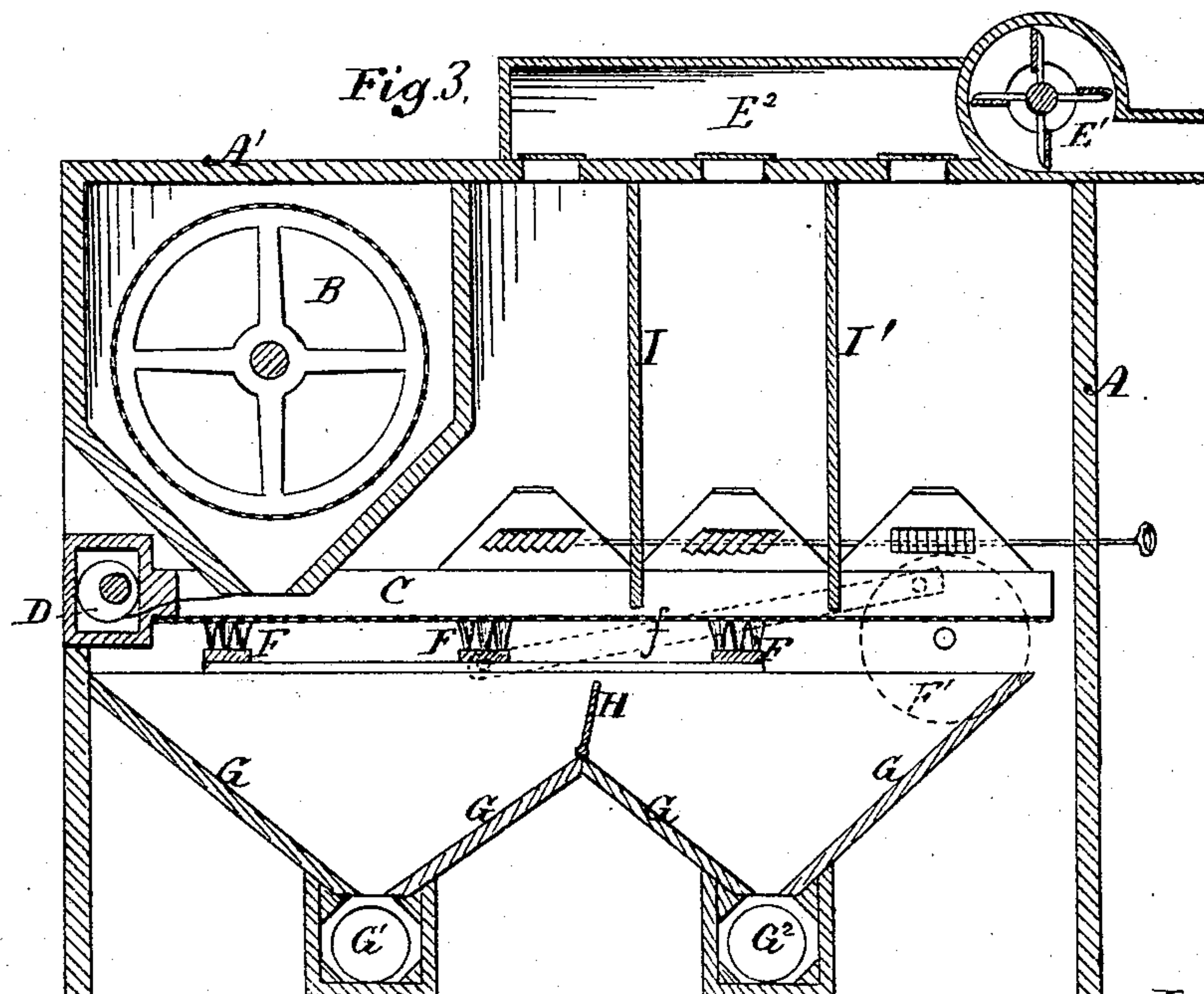


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE T. SMITH, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN MIDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **158,992**, dated January 19, 1875; application filed May 20, 1872.

To all whom it may concern:

Be it known that I, GEORGE T. SMITH, of Minneapolis, county of Hennepin, in the State of Minnesota, have invented a Middlings-Purifying Machine, of which the following is a specification:

Figure 1 is a perspective view of my improved machine. Fig. 2 is a top or plan view, a portion of the case being removed to show the grading-reel and the sections of the shaker. Fig. 3 is a vertical longitudinal section, and Fig. 4 is a vertical transverse section.

The first part of the invention consists in dividing a horizontal reciprocating bolt or shaker into two or more sections by means of longitudinal partitions, the bolting-cloth on one section differing in fineness from the cloth on the adjoining section or sections, the shaker being thereby adapted for receiving and bolting different grades of flour or middlings.

The second part of the invention consists in combining with a reciprocating bolt or shaker which is divided into longitudinal sections, as above described, a preparatory bolt or a grading-bolt, by means of which the flour or middlings can be divided into different degrees of fineness, so that the finer material may be delivered to that section of the shaker which is clothed with the finest cloth, coarser material to that section having coarser cloth, and so on.

Having thus set forth the nature of my invention, I will proceed to describe a machine which I have adopted for carrying it into effect.

In the drawings, A A represent the sides, and A' the top, of a bolting-chest of substantially the ordinary construction employed in this class of machine. B B¹ B² is a revolving or reel bolt, into which the meal is introduced from an elevator, or by any other usual method. This bolt is shown divided into three sections; but any number may be used. B is covered with No. 10 bolting-cloth, B¹ is covered with No. 8, and B² with, say, No. 6. C C¹ C² is a horizontal vibrating bolt or shaker, operated by the cam D on shaft D'. This bolt is divided by longitudinal partitions into sections corresponding in number and width to the sections of the reel B B¹ B²; and in practice I usually clothe the head at least of each section of the shaker C C¹ C² with cloth of the

same fineness as that of the section of the reel-bolt from which it receives its flour or middlings. E E (see Fig. 4) are vertical partitions arranged immediately above the partitions in the shaker, dividing the upper part of the bolt-chest into air-chambers, from which the air is exhausted by means of a fan or fans, E'. The apertures through which the air passes from these chambers to the fan are provided with dampers for regulating the strength of the air-currents; and in order that the currents shall increase in velocity after passing through the cloth, I employ converging wing-boards *e e*, which form throats *e'*. Thus, after a particle of bran leaves the cloth or surface of the middlings, its movement becomes constantly accelerated until it is discharged through the throat, so that there is little or no liability of its falling back upon the shaker. After the bran leaves the throat it may either pass out through the fan or be deposited upon the wing-boards. F F are brushes mounted upon a traveling frame, and caused to traverse the under surface of the bolt by means of a crank, F', and pitman *f*, or any equivalent device. G G are gather-boards, which collect the flour or middlings which fall through the shaker, and deliver the same to the conveyers G¹ G², each conveyer-trough having the usual traps or discharge-spouts, as in Fig. 4. H is an adjustable swing-board, hinged to the gather-boards, and employed to determine or regulate the proportion of flour or middlings which shall be delivered to each of the conveyers. The fan E', cam-shaft D', crank-wheel F', and the conveyers may be driven by any usual or approved system of belting or gearing, which need not be described. The reel-bolt B B¹ B² is slightly inclined, the end B, where the flour is fed in, being the highest. As the flour passes through the reel the finest portions are delivered to the section C of the shaker, another coarser portion is discharged upon the central section, C¹, and another still coarser portion falls upon C², it being intended that the cloth on the reel shall be coarse enough to permit all of the meal which contains any flour to pass through the last or coarsest section of the reel, leaving only the bran to pass off at the tail.

From the above description it will be read-

ily seen that each section of the shaker has delivered to it only that grade of middlings for which it is adapted; hence its surface is not overloaded with a large quantity of material which cannot pass through the meshes of its cloth. For this reason the operation of purifying and bolting is carried on with much greater rapidity, and a more thorough separation of the bran from the flour is effected, because the effect of the air-currents can be regulated with greater precision and facility.

The operation of the lower bolt or shaker will be substantially the same, whether the reel through which the material first passes be divided into cloths of different numbers or not, it being well known that if a cloth of uniform fineness be used from end to end the finest flour will fall through first. For this reason I do not wish to be limited to using different grades of cloth on the reel.

It will, of course, be understood that during the bolting process currents of air are made to pass through the bolting-cloth in an upward direction by means of the fan E¹.

In Fig. 3 I have shown another series of partitions, I I', arranged transversely of the shaker, and dividing each of the air-chambers formed by partitions E into three small chambers, each having a separate outlet into the fan-trunk E². When this construction is employed I usually prefer to form each section, C, C¹, or C², of the shaker of three grades of cloth, with the finest at the head, as by this means the draft may be more readily and perfectly regulated with reference to the fineness of the material to be operated upon.

It will be apparent that a reciprocating bolt or shaker may be employed instead of the reel B B¹ B² without departing from the spirit of

my invention, although I consider the reel to be preferable.

I have under some circumstances found it advisable to employ but two shakers or sections instead of three, as shown in the drawings, making each section with an independent frame, and actuating it with a cam, thus enabling me to make them counterbalance each other.

I do not claim the inclined wing-boards or partitions *e e*, as I prefer to embrace them in a separate application.

What I do claim is—

1. Two or more reciprocating bolting surfaces or shakers, through which a current of air passes, separated from each other by longitudinal partitions, the cloth upon one shaker differing in fineness from the cloth on the other shaker or shakers, thereby adapting them for receiving and bolting flour or middlings of different grades of fineness, substantially as set forth.

2. In combination with two or more reciprocating bolting surfaces or shakers, through which a current of air passes, the cloth upon one shaker differing in fineness from that of the other, a preparatory bolt constructed to divide the flour or middlings into different grades of fineness, the finer grade being delivered to the shaker which is clothed with the finer cloth, and a coarser grade to a coarser cloth, substantially as set forth.

In testimony whereof I have hereunto set my hand this 17th day of May, A. D. 1872.

GEORGE T. SMITH.

Witnesses:

ALEXR. MAHON,
RD. A. HYDE.

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