

J. M. CASE.  
Middlings Purifier.

No. 239,029.

Patented March 22, 1881.

Fig 1,

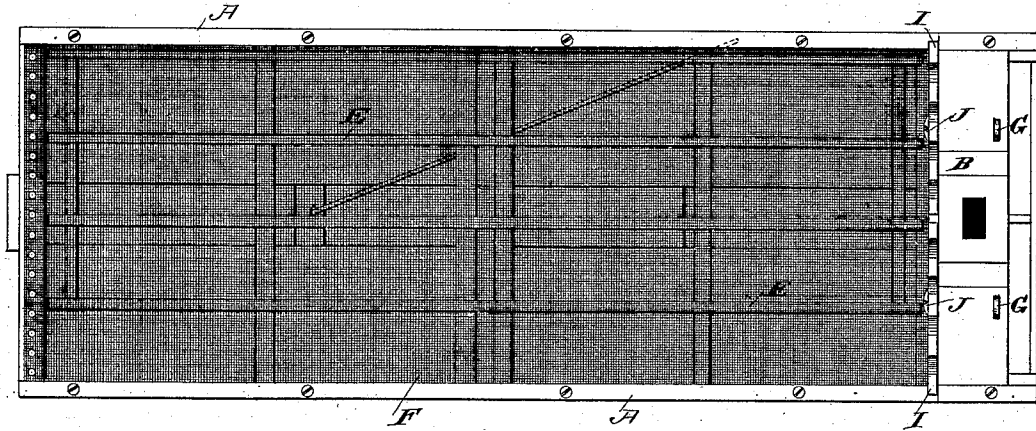


Fig 2,

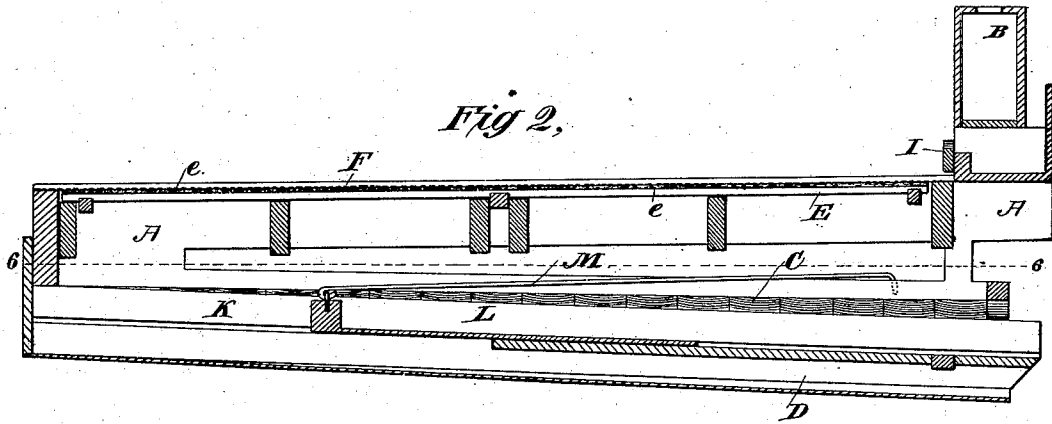
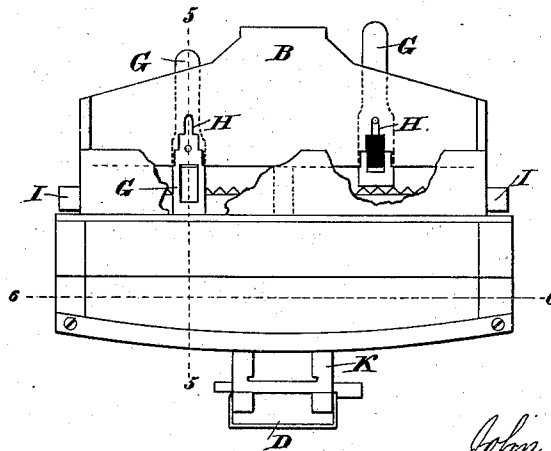


Fig 3,



Attest:  
 Geo. T. Smallwood, Jr.  
 H. E. Knight

Inventor  
 John M. Case  
 BY *[Signature]*  
 Atty.

J. M. CASE.  
Middlings Purifier.

No. 239,029.

Patented March 22, 1881.

Fig 4,

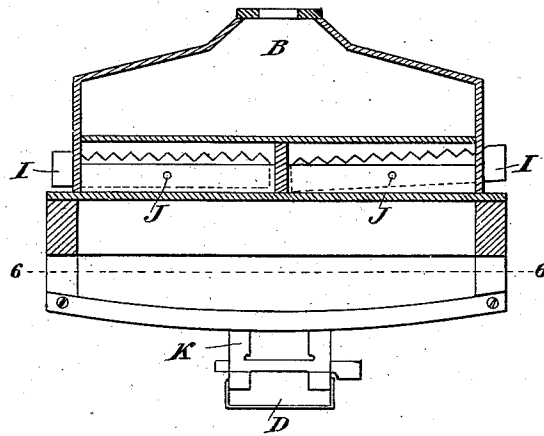


Fig 5,

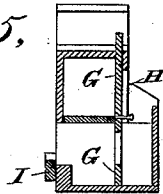
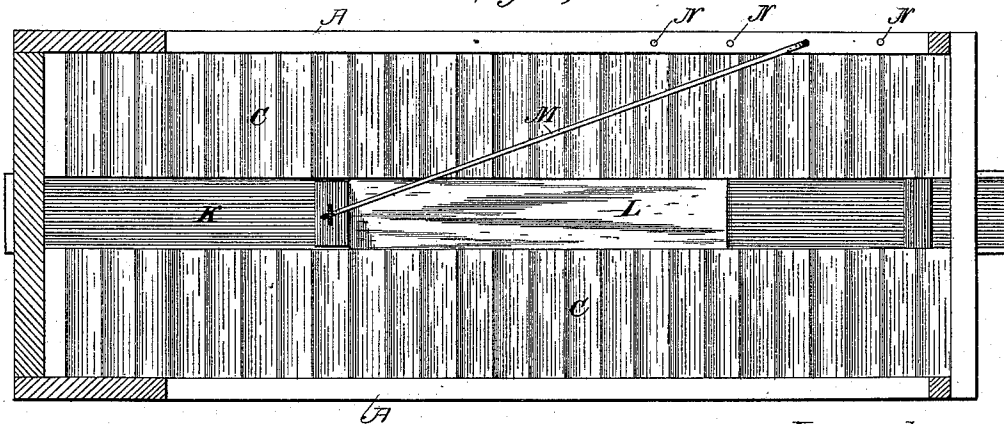


Fig 6,



Attest:  
 Geo. T. Smallwood Jr.  
 H. E. Knight

Inventor:  
 John M. Case  
 BY *H. E. Knight*  
 Atty<sup>ys</sup>

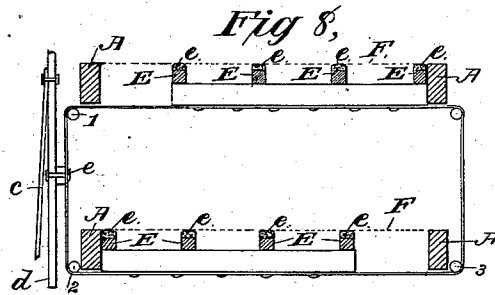
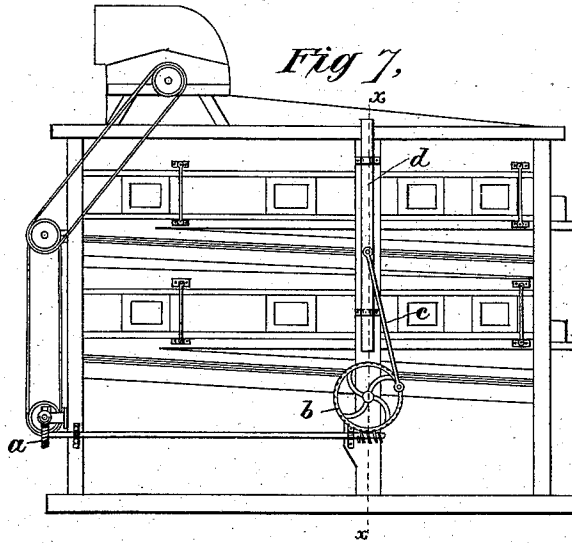
(Model.)

3 Sheets—Sheet 3.

J. M. CASE.  
Middlings Purifier.

No. 239,029.

Patented March 22, 1881.



*Attest:*  
*Geo. T. Smallwood Jr.*  
*A. E. Knight*

*Inventor*  
*John M. Case.*  
*BY* *Knights*  
*Attys*

# UNITED STATES PATENT OFFICE.

JOHN M. CASE, OF COLUMBUS, OHIO, ASSIGNOR TO CASE MANUFACTURING COMPANY, OF SAME PLACE.

## MIDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 239,029, dated March 22, 1881.

Application filed September 30, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, JOHN M. CASE, of Columbus, in the county of Franklin and State of Ohio, have invented new and useful Improvements in Middlings-Purifiers, of which the following is a specification.

My invention relates, first, to improved means for keeping the meshes of the cloth clean or clear, so as to dispense with the brushes or wipers heretofore used, and which are so deleterious to the cloth in wearing it out rapidly.

In my improved device the cloth rests upon and is supported by slats in such a manner as to permit the cloth to tremble or vibrate freely upon them by the action of the air-currents, the slats arresting the downward movement of the cloth suddenly, shaking the cloth sufficiently to clean or clear it on both top and bottom by the slight and almost imperceptible jarring, and causing but little wear to the cloth. The slats are secured to a frame which is moved slowly transversely of the riddle back and forth, so as not to obstruct the passage of the middlings in any particular part.

My invention relates, further, to improved means for evenly distributing the middlings upon the cloth, consisting of a feed-box provided with valved openings and pivoted adjustable bridges, as hereinafter described.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a plan view of the apparatus. Fig. 2 is a central longitudinal section of the same. Fig. 3 is an end view. Fig. 4 is a transverse section. Fig. 5 is a vertical section, through the feed-box, on the line 5 5, Fig. 3. Fig. 6 is a horizontal section on the line 6 6, Figs. 2, 3, and 4, showing the delivery-spout in plan view. Fig. 7 is a side view of my double purifier, showing the means of connecting and operating the cloth-cleaner. Fig. 8 is a section at  $x x$ , Fig. 7, showing the endless belt connecting the cloth-cleaners of two separate riddles.

The connected screen A, feed-box B, and delivery board and spout C D have a lateral shaking movement imparted to them in customary manner.

My invention for cleaning the cloth consists of a number of slats, E, running lengthwise of the screen A, underneath the cloth F, and answering both as supports to the cloth and as a means of keeping the meshes clean. These slats are framed together solidly, and are made to move by suitable mechanism about one-fourth ( $\frac{1}{4}$ ) the width of the riddle, or the distance between the slats. These slats may or may not be covered with a soft material,  $e$ , of any kind—such, for example, as plush or felt—to prevent wear of the cloth. As these slats are moved the motion of the shaking riddle and the action of the air cause the cloth to tremble lightly upon them. The effect is to clean the cloth, both on the top and bottom, without brushing or rubbing the same. These slats being made to shake with the riddle, there is no rubbing of the cloth against the cleaner, as in other devices, which rapidly wears the cloth out.

In practice it is found that the vibration of the cloth upon the movable slats is preferable to having it rub hard, as it effects the result of cleaning the cloth perfectly on top by the breaking up of any fine material which may adhere to the cloth, so that the air can get an action upon it. It is also found that a vibratory motion of the cloth on these slats or supports causes the middlings to be more active on the riddle, by which means the air gets a more complete action upon them, and a more perfect separation is thereby made.

I am aware that devices have been constructed for cleaning the cloth with traveling brushes, some of them traveling lengthwise and others from side to side of the machine; but my invention does not depend upon the principle of brushing to accomplish the result, but it is produced by a very rapid vibration of the cloth by the action of the air upon these movable supports. When the suction of air is applied to the cloth it inclines to raise the cloth off these movable slats, but the cloth being stretched tightly it instantly springs back upon the movable supports. The effect is to produce a constant tapping of the cloth upon the supports below, which jars out any material that may be gathered in the meshes of the cloth, and also breaks or loosens the soft fluff or fine material which often gathers upon the

top of the cloth, thus allowing the air to remove it.

In the ordinary brush, which depends upon the principle of brushing the cloth upon the under side to keep it clean, it is found that the cloth readily fills up on top and requires frequent brushing by hand. In addition to the cloth vibrating upon these slats or supports, it is found that, these supports being very light, they also are constantly vibrating, the vibratory or trembling motion being imparted by the rapid motion of the riddle. It will thus be seen that my cloth-cleaner is in no respect a brush, and that it does not depend in any manner upon the principle of brushing. The vibratory motion of the cloth and that of the movable supports is so rapid that it cannot be observed by the eye; but the effect is readily observed in the lively action of the material acted upon. Three important results are thus accomplished—that of cleaning the cloth on the top and on the bottom, and also imparting a lively action of the middlings, so that the air gets a perfect action upon them. I communicate the motion to these movable supports by means of a compound worm gear, which reduces the motion to from five to ten movements per hour.

On the shaft operating the lower riddle, at *a*, Fig. 7, I place a worm-gear. This shaft extends to the center of the machine, where the motion is further reduced by the worm-gear *b*. Upon this second worm-wheel I connect the pitman *c*, Fig. 8, which operates the sliding bar *d*. This sliding bar is rigidly connected at *e*, Fig. 8, with an endless belt passing around the friction-rollers 1 2 3 4. The endless belt is also rigidly connected with the movable cloth-supports *E*, Fig. 8. As the worm-wheel *b* revolves it produces a reciprocating motion of the sliding bar *d*, which communicates the motion to each of the movable cloth-supports.

The principle of my double machine may be carried out indefinitely by placing three, four, five, six, or more, machines or riddles in one frame in a vertical column; and in constructing machines of that kind the movable supports under each riddle are connected with the vertical sliding bar *d*, and all operated by one motion.

The feed-box *B*, as shown by the drawings, is provided with two sets of adjusting valves

or distributors, *G G*. The office of the valves is to guard the outlets *H H*, so as to supply an equal amount to each of the separate compartments, and that of the notched bridge *I* is to distribute the material equally over each half of the cloth. By raising the valve in one of the openings *H* it forms a higher bridge and causes more of the material to flow to the other part, and by tipping the notched bridge *I* one way or the other upon its central pivot, *J*, a perfectly even flow may be effected on the riddle. The conveyer-spout *K* below is provided with an adjustable sliding valve, *L*, for regulating the amount of the material which may at any time be necessary to pass back as returns, or, on the double machine described in my Patent No. 225,564, dated March 16, 1880, may be conducted to the lower riddle to be subjected to a heavier blast of air. The returns, as cut off, pass off from the lower spout and the purified middlings from the upper trough.

The sliding valve is operated by a stay-rod, *M*, held in any of the holes or notches *N* to retain the said valve in any position in which it may be set.

It will be seen that in my invention I combine a feed-distributor, cloth-cleaning device, adjustable cut-off, and conveyer, all in a simple, cheap, and efficient manner.

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

1. The combination of means, substantially as described, for producing upward draft, the cloth adapted to be vibrated by the air-currents, and the supporting-slats, arresting the downward movement of the cloth for the purpose of shaking it, as set forth.

2. The slats *E*, forming a support for the cloth intermediate of the side bars, and adapted to be moved slowly transversely of the riddle, in combination with a cloth adapted to vibrate thereon, as set forth.

3. The feed-box provided with valved openings *G H* and pivoted adjustable bridges *I*, substantially as set forth.

JOHN M. CASE.

Witnesses:

JAMES WATSON,  
CHAS. E. BURR, Jr.