(No Model.) 2 Sheets—Sheet 1.

J. M. RISHWORTH, S. INGHAM & J. VICKERS.

HOPPER OF DRESSING OR SEPARATING MACHINES FOR FLOUR OR OTHER MATERIALS.

No. 513,280. Patented Jan. 23, 1894.

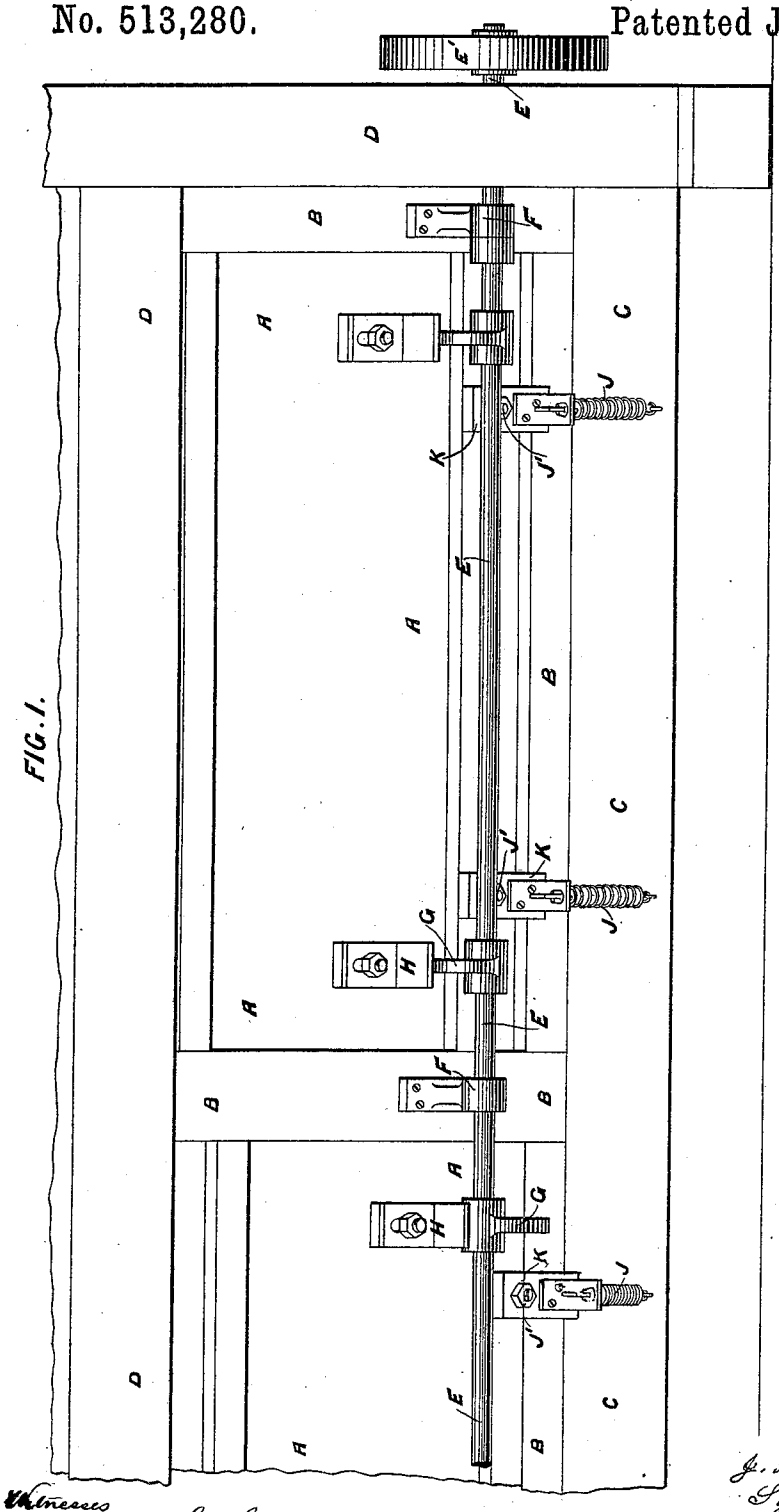

FIG. 1.

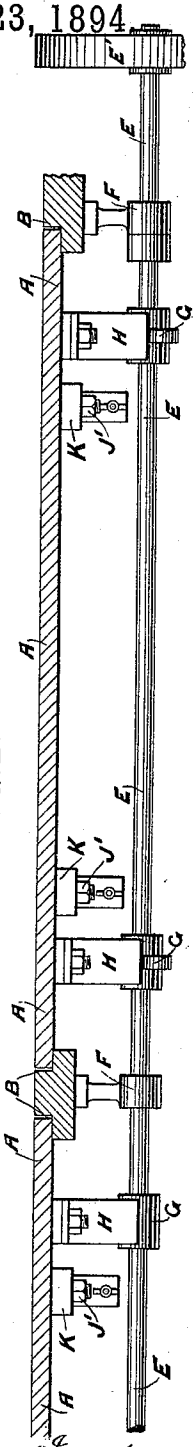

FIG. 2.

Witnesses
Chas. N. Smith
J. Stair

Inventors
J. M. Rishworth
S. Ingham.
J. Vickers
per Lemuel W. Serrell
Atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

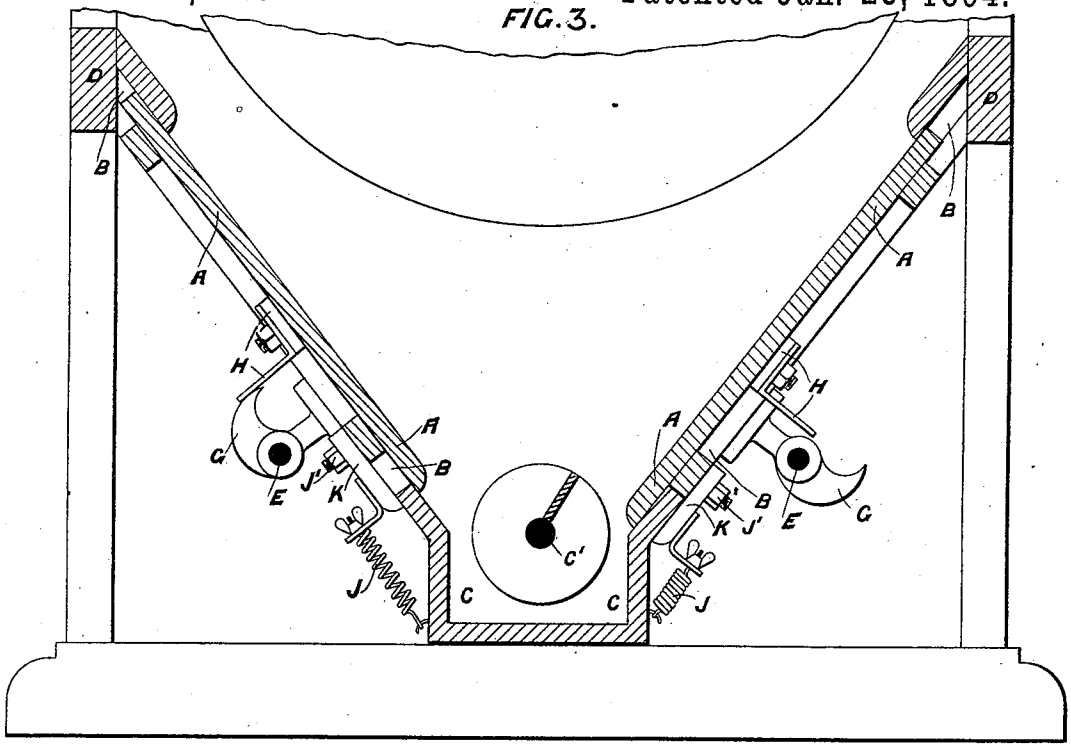
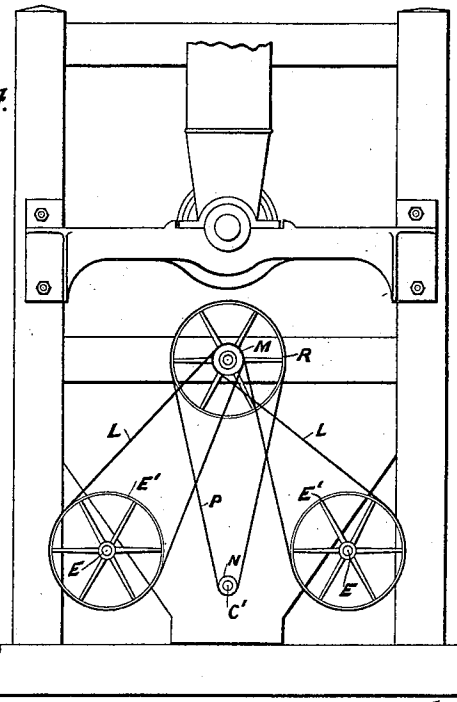


FIG. 4.



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Atty.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN MIDGLEY RISHWORTH, STEPHEN INGHAM, AND JOSEPH VICKERS, OF LEEDS, ENGLAND.

HOPPER OF DRESSING OR SEPARATING MACHINES FOR FLOUR OR OTHER MATERIALS.

SPECIFICATION forming part of Letters Patent No. 513,280, dated January 23, 1894.

Application filed June 26, 1893. Serial No. 478,774. (No model.) Patented in England February 27, 1893, No. 4,275.

To all whom it may concern:

Be it known that we, JOHN MIDGLEY RISHWORTH, STEPHEN INGHAM and JOSEPH VICKERS, all subjects of the Queen of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented new and useful Improvements in the Hoppers of Dressing or Separating Machines for Flour or other Materials, (for which a patent has been granted us in Great Britain, dated February 27, 1893, No. 4,275,) of which the following is a full, clear, and exact description.

The object of our invention is to effect improvements in the construction of V-shaped hoppers with inclined sides and such as have a trough (containing a conveyer) at the bottom thereof as used with machines for dressing or separating flour and the like, whereby according to our invention the said vertically inclined sides may be automatically and efficiently cleansed, while receiving the material from the machine, and also the said sides are so constructed that the same may be readily removed from the hopper when desired, all as hereinafter described. Hitherto these V-shaped hoppers have been constructed with fixed sides, being permanently attached to the worm box and to the frame of the machine. Thus the particles of flour or other material adhere to and accumulate on the sides of the hopper until they attain sufficient weight to cause them to slide down, thereby causing a flooding or overloading of the worm and outlet and interfering with the regular and even flow of the material. When heated moisture is stored up in the material; this accumulation of same on the sides of the hopper becomes very injurious, causing such material to become fouled and discolored.

In order that our invention may be fully understood, we will proceed to describe same with reference to the accompanying drawings, in which similar letters refer to like parts in all the figures.

Figure 1 is a part side elevation. Fig. 2 is a part sectional plan, and Fig. 3 a part transverse section of a dressing or separating machine, with our invention applied thereto. Fig. 4 is an end elevation of the machine drawn to a smaller scale, showing driving arrangement.

According to our invention, all the inclined sides A forming the V-shaped hopper are carried in fixed guides B in connection with the worm box C and frame D of the machine and are so arranged that they are free to be slid up and let fall back to the original position.

For the purpose of giving the required lift to the sides A of the hopper, we employ on each side a shaft E carried in bearings F on the stationary part of the hopper, on which shaft E a cam or cams G are mounted, which on rotating come in contact with a bracket or brackets H fixed onto the loose sides A, thereby lifting such sides. The amount of lift may be varied as required by adjusting the position of the bracket or brackets H on the hopper sides A. Each side A can be subdivided and fitted with separate brackets H and actuated from the same cam shaft E by separate cams G, acting at different times, all according to the length of the machine. On the cam or cams G leaving the said bracket or brackets H, the side A at once slides down into its normal position, and the said side A may be assisted in its descent by means of a spring or springs J fixed on the lower end of the loose side A and to the trough or worm box C. This arrangement of mechanism as stated is applied to both of the loose sides A A, of the hopper. By lifting the sides A and allowing them to fall suddenly, as above described, a shock is imparted, thereby rendering it impossible for the material to adhere to and accumulate on such sides A, thus avoiding the many injurious effects before referred to. By unscrewing the nuts J′ and taking off the pieces K which help to guide the sides A during their movement up and down, such sides A can be easily taken out. Consequently the trough or worm box C is more readily got at, and can thus be cleansed with much greater facility than hitherto.

The required rotary motion is imparted to the cam shafts E by means of their pulleys E′, belts or straps L and pulley M, such pulley M

receiving its motion from the worm shaft C′ through the pulley N, belt or strap P and pulley R.

We are aware that it is not new to employ reciprocating bolt frames operated by cams and springs, nor is it new to clean a hopper with flappers.

We are also aware that it has been proposed to employ a hopper having at the bottom thereof a horizontal or inclined serrated slide or rack reciprocated by cams or the like for forcing the material out of the hopper. To such devices we lay no claim.

In our separating machine the inclined sides of the V-shaped hopper on which the material falls are movable, and are raised up and slide down for preventing accumulations on the sloping sides and thereby equalize the feed of the material.

We claim as our invention—

In separating apparatus having a V-shaped hopper, the combination with the fixed conveyer trough C forming the base of the V-shaped hopper, of the oppositely inclined movable sides A A, guides B therefor, brackets H adjustably connected to the sides A, cams G and revolving shafts E to act upon the brackets H and periodically lift the said inclined sides A and allow the same to slide down, whereby the separated material is caused to pass regularly to the trough and conveyer, substantially as set forth.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

JOHN MIDGLEY RISHWORTH.
STEPHEN INGHAM.
JOSEPH VICKERS.

Witnesses:
GRIFFITH BREWER,
JOHN JOWETT.