

(No Model.)

3 Sheets—Sheet 1.

R. A. STUBBS & J. SAUNDERS.
BOLTING OR SEPARATING MACHINE.

No. 580,067.

Patented Apr. 6, 1897.

Fig. 1.

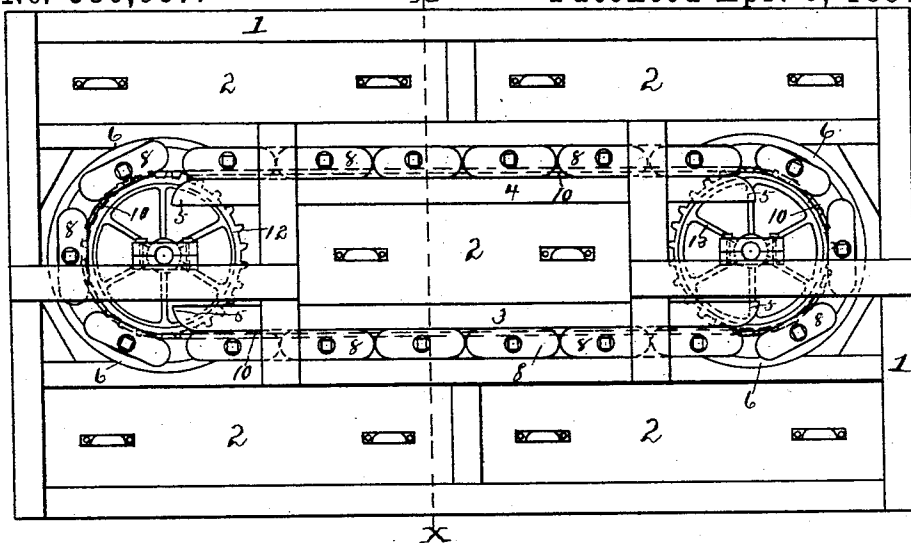
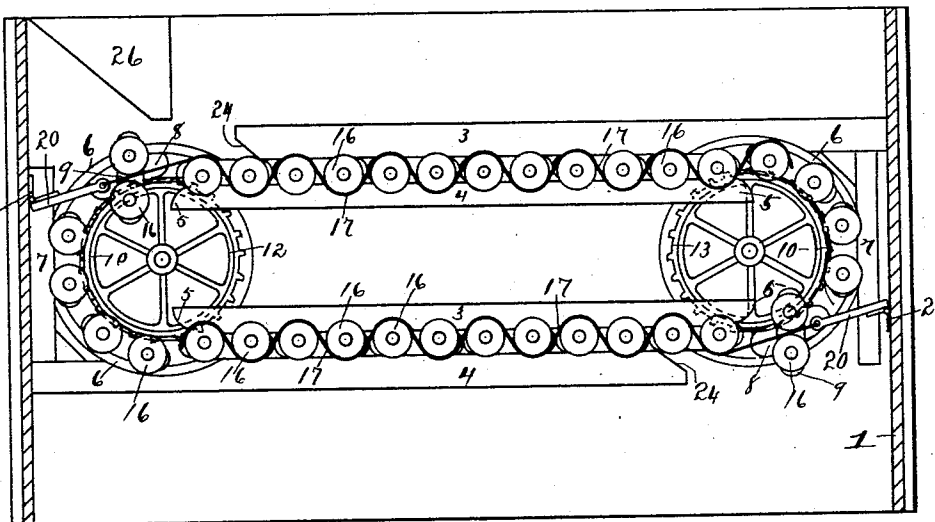


Fig. 2.



WITNESSES:

L. L. Allen.

A. J. Fiorini.

R. A. Stubbs.
J. Saunders.

INVENTORS.

By R. J. McCarty
ATTORNEY:

3 Sheets—Sheet 2.

No. 580,067.

Patented Apr. 6, 1897.



L. L. Allen

A. J. Fiorini

R. A. Stubbs
J. Saunders
INVENTORS.
By R. J. M. Earty
their ATTORNEY:

(No Model.)

3 Sheets—Sheet 3.

R. A. STUBBS & J. SAUNDERS.
BOLTING OR SEPARATING MACHINE.

No. 580,067.

Patented Apr. 6, 1897.

Fig. 8.

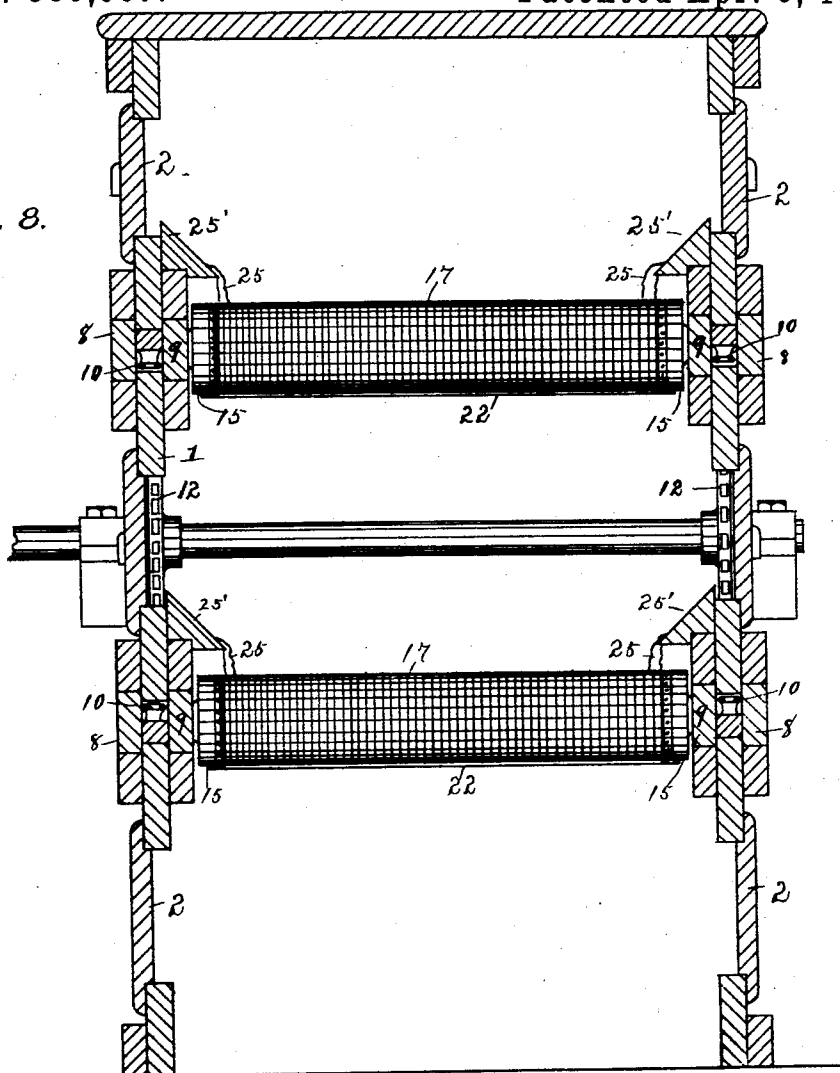
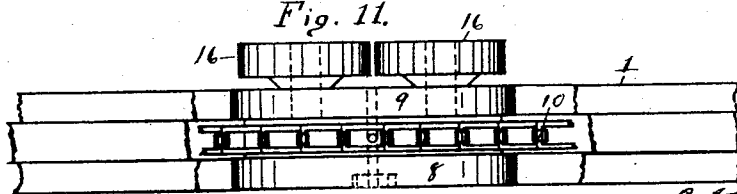


Fig. 11.



WITNESSES:

L. L. Allen
A. J. Fiorini

R. A. Stubbs
J. Saunders
INVENTORS.

By R. J. McCarty
their ATTORNEY:

UNITED STATES PATENT OFFICE.

RILEY A. STUBBS AND JAMES SAUNDERS, OF DAYTON, OHIO.

BOLTING OR SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,067, dated April 6, 1897.

Application filed May 23, 1896. Serial No. 592,838. (No model.)

To all whom it may concern:

Be it known that we, RILEY A. STUBBS and JAMES SAUNDERS, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Bolting or Separating Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to separators or bolting-machines.

The main object of the invention is to avoid the scouring and pulverizing method common in separating stock from the coarser matter and to preserve it as far as possible in the condition it is in after leaving the reduction-rollers. It is well known that in the separators now in use, namely, those of the gyrating and the revolving type, the stock is treated to such severe agitation that the flour rendered is of an inferior quality. This rough handling of the stock is due to the form of separators named, which necessarily have to be run at a high rate of speed. This acts to pulverize and destroy the nutritious quality of the wheat. Aside from the injury done to the stock by this method of separation the effect is most injurious to the bolting-cloth. In the rotary movement of the reel or sifter the stock is carried up the sides of the reel until it attains a certain height and is then thrown down in a bulk to the center of said reel by the continued rotation thereof. The friction created by this force grinds the stock and forces the coarser particles or foreign matter into the meshes of the cloth, which in time becomes clogged up and unserviceable. The bolting-cloth necessarily has to be cleaned frequently on this account by the various means employed. This frequent cleaning also has a wearing effect on the cloth. Therefore the aim of this invention is to provide means for separating the stock by submitting it to a more gradual and gentle treatment whereby the nutriment of the wheat is preserved and the life of the machine greatly prolonged. This is accomplished by means of a station-

ary machine in which there is a bolting-cloth that is subjected to a series of traveling ruffles or flutes while the machine is in operation, the position of said cloth as a whole remaining stationary. There is no weight or force imparted to the cloth, and no weight or force at all is placed on the cloth beyond the weight of the stock itself, and the movement of said stock is effected by the changing flutes in the cloth.

Another object of the invention is to provide a machine having a greater capacity or any given length of which has a capacity for separating a third more stock in lineal inches as compared to the machines hereinbefore referred to. This is due to the stock being equally distributed at all times over the entire area of the bolting-cloth, so that any given quantity of said stock will not come in contact with the same part of the cloth more than once. In the machines now in use and hereinbefore referred to the contact of the stock with the cloth is uncertain, owing to said stock being revolved in a bulk and thrown from the center to the circumference, a portion thereof coming in contact with the same part of the cloth two or more times, while other portions of the cloth will remain untouched. Again, in the separators referred to it is necessary to use a wire-cloth for the first reductions, as a cloth of a more delicate mesh will not resist the force of the stock in its coarser state, and therefore will soon become worthless; also, the use of a wire-cloth is objectionable, owing to the stock becoming pulverized thereby. In this invention these objections are avoided. A silk cloth may be used from beginning to end of the operation.

In the accompanying drawings, which illustrate the invention, Figure 1 is a side elevation of the improved separator, showing in broken lines the sprocket-chain on one side of the machine. Fig. 2 is a longitudinal section through a central part of the machine. Fig. 3 is a top plan view showing in broken lines some of the transverse ribs upon which the bolting-cloth is supported between the rollers or wheels. Fig. 4 is an enlarged top plan view of one of the traveling blocks with its pair of wheels. Fig. 5 is a side elevation of Fig. 4. The extent of movement of the swiveling portion of said block is shown in broken

lines. Fig. 6 is a top plan view of a portion of one of the transverse ribs, showing its attachment to one of the straps. Fig. 7 is a side elevation of a portion of one of the side aprons.

5 Fig. 8 is an enlarged vertical section on the line $x x$ of Fig. 1. Fig. 9 is an end elevation of Fig. 5. Fig. 10 is an enlarged top view of a portion of one side of the machine, showing the straps passing under and over the wheels and the bolting-cloth attached to said strap. Also the transverse ribs are shown in this view. 10 Fig. 11 is a top view of a portion of one side of the frame, showing a pair of wheels in position under the broken-away part of the frame, the strap being removed.

Similar reference-characters indicate corresponding parts throughout the several views.

15 1 designates the frame, having drawers 2, through which access is had to the interior of the machine.

3 3 and 4 4 designate upper and lower horizontal tracks or guideways on the inner sides of the frame, having their ends rounded, as at 5 5.

15 6 6 designate curved guideways leading from said horizontal guideways, and 7 7 are vertical guideways at the ends of the frame, onto which the curved guideways lead. Traveling blocks are conducted over these guideways, each of which consists of two parts 8 and 9. There are two series of these blocks, one on each side of the frame, and movement is given them by means of sprocket-chains 10 10, which are attached to each part 8 of said blocks, as shown in Figs. 4, 5, and 9. The sprocket-chains run over two wheels 12 and 13 on each side and at the ends of the frame, wheels 12 being driven by the main driving-pulley 14, which is on the same shaft. Parts 10 9 of said blocks have a pivotal connection with the face of parts 8, and are thereby permitted to turn upon their own axes, as shown in Figs. 5 and 9, when they reach the vertical guideways 7 7, while parts 8, to which the chain is attached, continue to follow the circumference of the sprocket-wheels. Further mention will hereinafter be made of the movement of these blocks.

15 15 15 designate straps of leather or any other suitable material having the desired pliability. One of these straps lies on each side of the frame and is passed over and under each alternate wheel 16 throughout its length, as is shown in Figs. 2 and 10. There are two 55 wheels 16 mounted on each of the blocks 9.

17 17 designate upper and lower bolting-cloths of any suitable material. These cloths are, as a whole, stationary as to any bodily movement or any movement that would 60 change their entire location, but they are subjected to a series of changing or traveling flutes. These bolting-cloths are attached throughout their longitudinal edges 17' to the straps 15 15, as shown in Fig. 10. Therefore 65 when the wheels 16 16 are traveling with the sprocket-chains the bolting-cloths are given a continuous series of transverse traveling

flutes which extend throughout their entire length.

It will be understood that the bolting-cloths 70 being attached to the edges of the straps they will assume the same curves and positions that the straps assume, which is clearly shown in Figs. 2 and 3. Both ends of said cloths may be secured to the ends of the frame, but 75 in the drawings one end only of each is attached to strips 18 18 of canvas or other suitable material.

19 19 designate transverse supporting-rods to which the outer ends of said canvas are attached, and 20 20 are arms in which said rods are mounted. These arms are attached to the ends of the frame by hinges 21 21, which afford a flexible connection and allow any vibration of the bolting-cloths due to the action 85 of the traveling wheels.

22 designates a series of transverse ribs attached to the edges of the straps 15 15 and extending across the machine. These ribs serve to keep the straps in a proper position, and they occupy positions on the inside of the bolting-cloths. In Fig. 8 it will be seen that two of these ribs appear in their lower position. It will be understood that as the straps pass over the top or upper sides of the next 95 two adjacent wheels on either side of those shown in said figure the positions of the next adjacent ribs will be above the wheels, or just the opposite of those shown in said figure. In other words, the said ribs change their positions with the changes of the straps and bolting-cloths. 100

It will be understood that as the sprocket-chains carry around the traveling blocks to which the wheels are attached, the straps and 105 bolting-cloths being stationary, a series of flutes is formed by the movement of the wheels.

The two parts 8 and 9 of the traveling blocks travel in positions parallel with each other 110 while being carried over the horizontal and curved guideways 3, 4, and 6. This continues until said blocks arrive in an upright position on a horizontal plane with the axis of either sprocket-wheel. The part 8 of said 115 blocks, which the chain is attached to, continues to follow the circumference of the sprocket-wheel, while the part 9, to which the wheels are attached, comes in contact with the vertical guideways 7 7 and proceeds in a 120 perpendicular position or a position on an angle to part 8, as shown in Figs. 2 and 5. As the chains continue to carry the blocks around the lower wheel on part 9 comes in contact with the rounded ends of the horizontal guideway, and with the cooperation of the upper beveled end 24 of said guideway said part 9 is brought into a position parallel with part 8, and both blocks so travel until each is brought on a horizontal plane with the center 130 of a sprocket-wheel. When this parallel position of said blocks takes place, the flutes in the bolting-cloths commence to be formed. The wheels 16 16 revolve on their own axes

only when the straps are between them. They might, however, be mounted rigidly and be capable of performing the function of forming the flutes in the cloths, but this is undesirable, owing to the friction that would be created between the wheels and straps.

On and to both sides of the bolting-cloths there are attached aprons 25 25, of any suitable flexible material. These aprons are designed to prevent any of the stock from passing off the sides of the cloths or coming in contact with the wheels when the machine is in operation. The longitudinal edges of these aprons are carried upwardly at right angles to the bolting-cloths and are attached to tapering strips 25' 25' on each side of the machine. (See Fig. 8.) The portions of said aprons that are adjacent to the flutes in the bolting-cloths will of course be stretched taut, while the portions of said aprons on each side of said flutes will gather or pucker, substantially as is shown in Figs. 7 and 8.

26 is a feed-hopper in the upper part of the frame from which the stock is fed to the upper cloth. Any suitable receptacle may be placed below the cloths to receive the sifted flour. Therefore it has not been deemed necessary to illustrate this feature. The stock may be fed to the lower cloth by means of a hopper or chute (not shown) or in any convenient manner. Should any large or irregularly-shaped particles of grain or other matter become lodged in the meshes of the cloth in any of the flutes, they will be released when that portion of the cloth assumes an upper or convex position. This release is due to the meshes opening or expanding from the outer side of the cloth when said cloth is in the upper or convex position and at which time said particles gravitate onto the next flute in advance and are carried forward by each newly-formed flute and discharged at the end of the cloth with the other separated matter.

The operation of the machine is as follows: The stock is fed to the bolting-cloth near the forward end, or the end from which the flutes travel, and it immediately gravitates to the flute formed nearest that point. From this flute the said stock is passed to the next flute, and so on, as each flute is formed in advance of the preceding one, throughout the length of the cloth. The stock is thus conveyed by a series of traveling flutes to the opposite end of the cloth, where the coarser or foreign matter passes off, the separated flour having in the meantime passed through the cloths to the receiving-receptacle below. It will be seen that there is no friction created in this manner of handling the stock beyond the slight movement necessary to transfer it from one flute to another. As the wheels are carried on their horizontal guideways by the sprocket-chains the flutes are successively formed and into each flute the stock is advanced. There is no throwing off or vigorous movement imparted to the stock

to impair its quality or damage the cloth. It is well known to those familiar with wheat-milling that the method and machinery now in use for separating pulverizes the stock to such an extent that deprives it of the principal nutriment it possesses after leaving the reduction-rollers. This is entirely avoided by the gentle yet thorough handling received by the means herein described. So far as we are aware it is new to create in a bolting-cloth or a separator a series of traveling flutes through which the stock passes throughout the length of said cloth. Some changes might be made in the minor details without departing from this, the spirit of the invention, which we desire to broadly claim.

Having fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a bolting or separating machine, the combination with a supporting-frame, of a bolting or separating cloth secured to said frame, a series of traveling wheels inclosing the longitudinal edges of said cloth, and means for moving said wheels to form a series of changing or traveling flutes in said cloth, substantially as shown and described.

2. In a bolting or separating machine, the combination with a supporting-frame, of a bolting or separating cloth secured thereto, a series of traveling wheels on each side of said frame, and straps inclosed between said wheels to which the longitudinal edges of said cloth are secured, and means for moving said wheels whereby a series of traveling flutes is formed in said cloth, substantially as shown and described.

3. In a bolting or separating machine, the combination with a supporting-frame, of a bolting or separating cloth having an attachment to said frame, straps secured to the longitudinal edges of said cloth, trains of traveling blocks movable in guideways in said frame, wheels mounted on said blocks adapted in their travel to alternately inclose the upper and lower sides of said straps, and thereby create a series of changing flutes in the bolting-cloth, and means for moving said trains of blocks, substantially as shown and described.

4. In a bolting or separating machine, the combination with a supporting-frame, having guideways therein as described, of a series of traveling blocks each of which consists of two pivotal parts, a sprocket-chain attached to one of said parts, and wheels mounted on the other of said parts, straps passing under and over each alternate wheel, and a bolting or separating cloth attached to said straps which is subjected to a series of traveling flutes by the movement of said wheels.

5. In a bolting or separating machine, the combination with a supporting-frame having guideways therein, of two series of traveling blocks adapted to travel in said guideways, each of said blocks being composed of two parts 8 and 9 pivotally connected, whereby the said parts are permitted to assume posi-

tions on angles to each other at a point of their travel, sprocket-chains to which one of said parts is attached, wheels mounted on the other part of said blocks, straps inclosed by
5 said wheels, a bolting-cloth having its longitudinal edges attached to said straps, and means for driving said sprocket-chains, whereby motion is imparted to the traveling blocks, and wheels, and a series of traveling flutes is
10 formed thereby in said bolting-cloth, substantially as shown and described.

6. In a bolting or separating machine, the combination with a supporting-frame having guideways therein, of traveling blocks adapted to move in said guideways, each of said
15 blocks being pivotally connected as described and adapted to assume varying positions during a certain point of their travel, sprocket-chains, and wheels attached to said blocks,
20 straps inclosed by said wheels, a series of transverse ribs to maintain said straps in position, and a bolting-cloth to the longitudinal

edges of which the said straps are attached, substantially as shown and described.

7. In a bolting or separating machine, the
25 combination with a frame provided with horizontal, curved and vertical guideways, of two series of traveling blocks adapted to move in said guideways, each of said blocks having a
30 pivotal part that alone is guided in said vertical guideway, wheels mounted on said pivotal part, straps inclosed by said wheels, a bolting-cloth having its longitudinal edges secured to said straps, and a series of transverse ribs attached to said straps, and extending across
35 the machine, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

RILEY A. STUBBS.
JAMES SAUNDERS.

Witnesses:

R. J. MCCARTY,
WM. B. JUDINGS.