

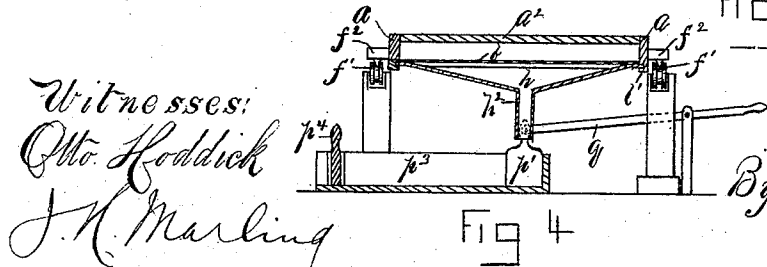
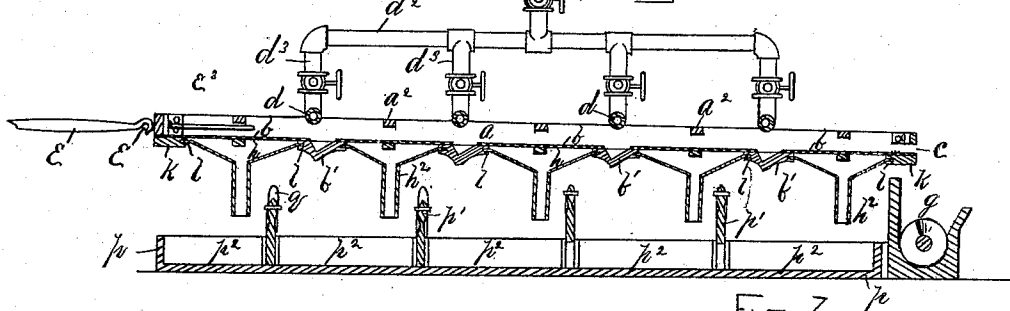
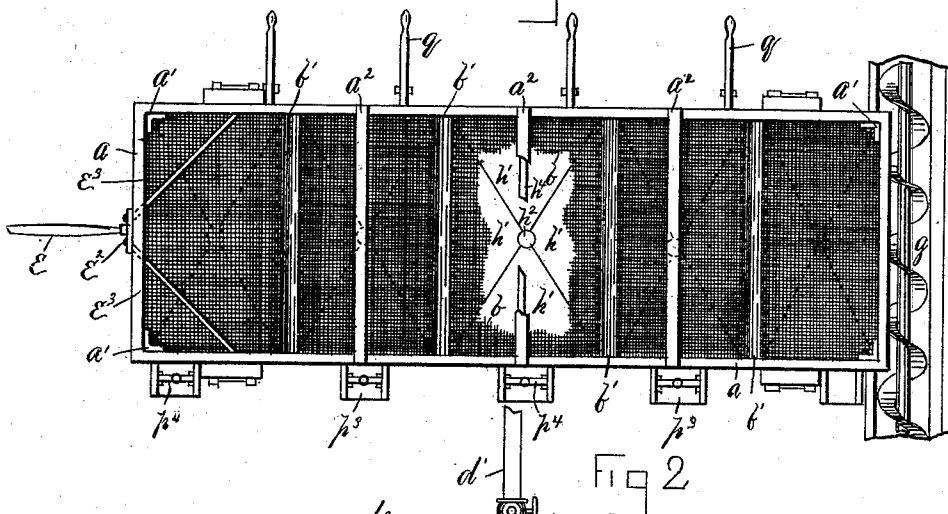
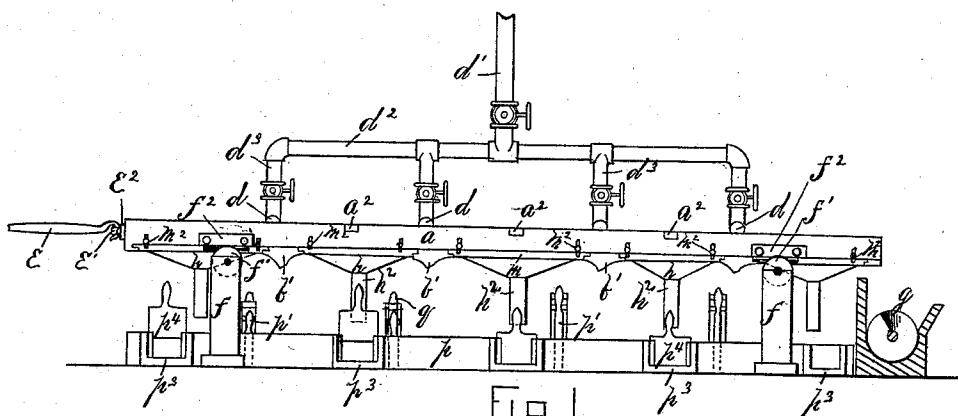
(No Model.)

2 Sheets—Sheet 1.

G. S. GRAVES.
STARCH SEPARATOR.

No. 270,304.

Patented Jan. 9, 1883.



Witnesses:
Otto Hoddick
J. H. Marling

Inventor.
Gilbert S. Graves
By
W. T. Miller
Atty.

(No Model.)

2 Sheets—Sheet 2.

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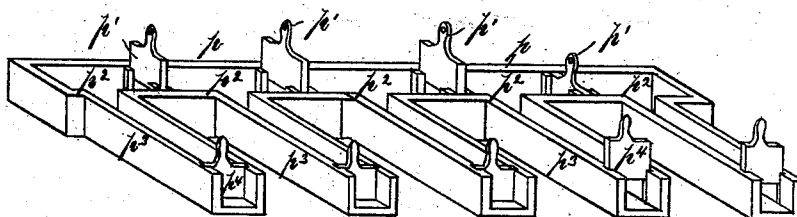


Fig 5

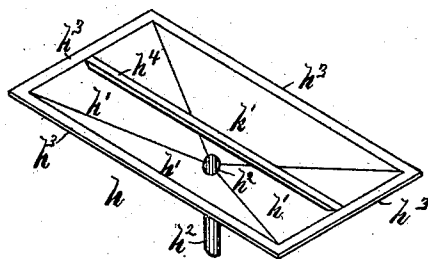


Fig 6

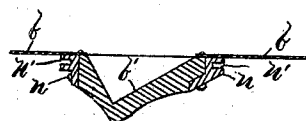


Fig 9

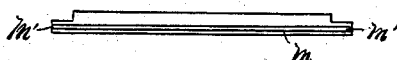


Fig 7

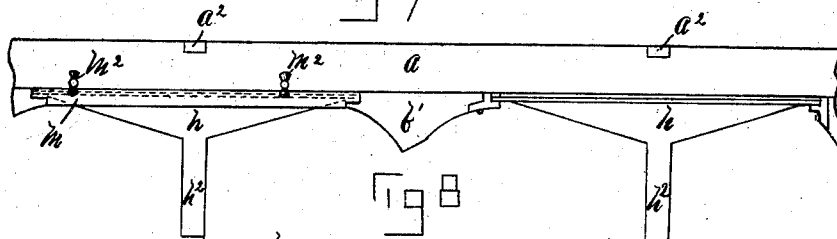


Fig 8

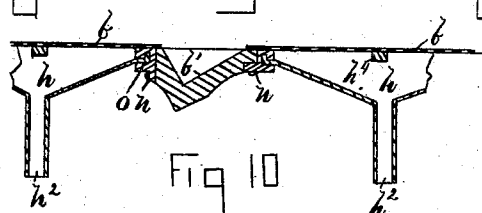


Fig 10

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UNITED STATES PATENT OFFICE.

GILBERT S. GRAVES, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO
HARRY HAMLIN, OF SAME PLACE.

STARCH-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 270,304, dated January 9, 1883.

Application filed November 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, GILBERT S. GRAVES, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Starch-Separators; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

My invention relates more particularly to certain improvements in starch-separators for which Letters Patent No. 256,315 were granted to myself and Jacob Heede on the 11th day of April, 1882. In such patent was shown a sieve provided with transverse strips or gutters, which were adapted to receive the impact of the falling water, and which divided the bolting-cloth into separate and independent sections. A receptacle below and separate from the sieve received all the material which passed through the bolting-cloth.

One of the objects of my present invention is to provide improved means for collecting separately the different gravities of starch-liquor which pass through different sections of the bolting-cloth, it being understood that the starch-liquor is less diluted with the spraying-water at the upper portion of the inclined sieve than at the lower portion. Another object of my invention is to provide means for taking the different gravities of starch-liquor which have been separated after passing through the bolting-cloth and combining or reuniting them into different degrees of consistency.

To these ends my invention consists, first, in providing the vibrating sieve upon its under side with a series of two or more independent trays or receptacles, which are removably secured upon such under side, and which partake of the vibratory motion of the sieve, each tray or receptacle being provided with a separate discharge pipe or opening; and, second, in providing below the discharge pipes or openings in the trays a common trough or receptacle, divided by adjustable or removable partitions or gates into separate sections, each of which

sections being provided with a separate outlet, also having an adjustable or removable partition or gate; third, in other details of construction, which will be more fully hereinafter described and claimed.

I will now proceed to more particularly describe the manner in which I have carried out my invention.

In the drawings, Figure 1 is a side elevation of my improved form of starch-separator. Fig. 2 is a top plan view of Fig. 1 with the spraying device removed. Fig. 3 is a vertical longitudinal section of Fig. 1. Fig. 4 is a vertical transverse section of Fig. 1, taken through the center of one of the trays or receptacles of the sieve. Figs. 5, 6, and 7 are views of detached details. Fig. 8 is a partial view, enlarged, showing mode of adjusting the trays or receptacles upon the bottom of the sieve; and Figs. 9 and 10 are sectional views of modified details.

Referring to the drawings, *a* is the rectangular sieve-frame, having the corner-braces *a'* and cross-pieces *a''*. The bolting-cloth is applied to the under side of the sieve in separate sections *b*, having the transverse channels or troughs *b'*, preferably of wood, between the sections *b* of bolting-cloth.

c is an opening in the lower end of the sieve-frame *a*, through which the residue which remains upon the sieve is discharged.

d are perforated water-pipes, arranged horizontally in a transverse direction over the troughs *b'*, so that the sprays of water will fall upon the troughs *b'* and not upon the bolting-cloth. These pipes *d* are supplied with water from the pipe *d'* by the connecting-pipes *d''* *d'''* *d''''*.

The pitman *E* imparts a shaking motion to the sieve-frame by means of any suitable motive power, and is removably attached thereto by the eye *E'*.

E'' *E'''* are braces for imparting additional stability to the upper end of the sieve-frame.

f represents the posts, four in number, having the rollers *f'* in their upper ends, upon which the sieve-frame is reciprocated by means of guide-plates *f''*, fitted to the sides of the sieve-frame. The rollers *f'* are grooved for the reception of ribs upon the plates *f''*.

g is a conveyer-trough for the reception of the residue from the sieve.

The parts thus far described are the same as in the patent to myself and Jacob Heede, hereinbefore mentioned, and with these parts I have arranged and combined my improvements in a manner which I will now proceed to more particularly describe.

h represents the trays or receptacles, which are removably attached to the under side of the sieve-frame a . These trays, as clearly shown in Fig. 6, are slightly pyramidal in form, having the four sides h' converging downwardly to the discharge-outlet h^2 .

h^3 is a flange around the edges of the tray, and h^4 is a bar rigidly secured across the tray, and which serves, when the tray is in position under the sieve, to support the bolting-cloth b above it. The lower cross-pieces, kk , at each end of the under side of the sieve-frame, and the troughs b' , are provided with transverse grooves l ; and l' (see Fig. 4) is a longitudinal groove in one of the side pieces, a , of the sieve-frame. The trays are placed in position by sliding the flanges h^3 into the grooves l and l' , and when in position are held against lateral displacement by the pieces m , one of which is shown in position in Fig. 8, and separately in a reversed inverted position in Fig. 7, to show the groove m' , into which the remaining flange of the tray fits. This piece is held in position by the buttons $m^2 m^2$. Each section, b , of bolting-cloth between the troughs b' has a separate tray, h , located beneath it. In Fig. 9 I have shown a modified form of groove, in which, instead of the groove being made directly in the wooden trough proper, I have secured to the sides of the trough, underneath the bolting-cloth, the metal strips n , having the grooves n' cut therein. This construction is of a more durable nature than that shown in Fig. 3. A further modification is shown in Fig. 10, in which the flange h^3 of the tray is turned up at right angles, as shown at o , and the groove for its reception is made of corresponding form. This construction will effectually prevent any leakage of the trays at their edges.

Underneath and in line with the outlets h^4 of the trays h , I have arranged the narrow trough p , having the sliding partitions or gates p' , dividing the trough p into a number of sections, p^2 , equal to the number of the outlets h^4 , and each of these sections p^2 is provided with an auxiliary trough or outlet, p^3 , provided with a sliding partition or gate, p^4 . The gates p' in the trough p , being underneath the sieve, are for convenience of adjustment provided with the levers q , which extend from the gates p' out beyond the sieve-frame, as clearly shown in Fig. 4.

Having thus described my improved apparatus, I will now briefly set forth its mode of operation.

The starch-liquor, as it passes down through the different sections of bolting-cloth between the troughs b' , is caught by the trays h , and from thence discharged into the trough p beneath. The starch liquor collected by the tray at the highest end of the sieve is not diluted

by the spraying water. That collected in the next tray is but slightly diluted, and in each succeeding tray the starch-liquor becomes more highly diluted. My improved system of trays enables me to collect separately these different gravities of starch-liquor in a more complete and thorough manner than has been heretofore accomplished. The different gravities of starch-liquor can, if desired, be received separately in the different sections p^2 of the trough p by shutting down the gates p' , and conducted through the separate auxiliary troughs p^3 to the points desired by raising the gates p^4 . If, however, from the peculiar and varying nature of the starch-liquor which is passed through the sieve, it is deemed desirable to reunite or combine the several gravities to form different degrees of consistency in the starch-liquor, this can be quickly and easily accomplished by a proper adjustment of the two series of gates, p' and p^4 . For instance, the starch-liquor which passes through the first three sections of bolting-cloth can be reunited after such passage and conducted to a common receptacle by raising the first two gates in the trough p and closing any two of the first three gates p^4 ; and other combinations can be effected by a corresponding manipulation of the two systems of gates.

I am aware that it is not broadly novel to separate the different grades of starch-liquor after its passage through the bolting-cloth of the sieve or separator, and I do not lay claim to such broad idea; but

What I do claim is—

1. In a starch-separator, a vibrating sieve provided upon its under side with a series of two or more independent trays or receptacles provided with suitable outlets and removably secured to such sieve, as and for the purpose stated.

2. In a starch-separator, a vibrating sieve composed of two or more sections of bolting-cloth and one or more intermediate troughs or strips, and provided on its under side with a separate tray or receptacle for each section of bolting-cloth, such tray or receptacle being provided with a suitable outlet and removably secured to such sieve, as and for the purpose stated.

3. In a starch-separator, a main trough for receiving the previously-separated grades of starch-liquor, provided with a series of adjustable gates or partitions, and having auxiliary troughs leading therefrom, each provided with an adjustable gate or partition, whereby the previously-separated gravities of starch-liquor can be reunited or combined, as desired, substantially as shown and described.

4. In a starch-separator, the combination, with a vibrating sieve provided upon its under side with a series of two or more independent trays or receptacles having suitable outlets and removably secured to such sieve, of a main trough for receiving the contents of the trays or receptacles, such trough being provided with a series of adjustable gates or partitions

and having auxiliary troughs leading therefrom, each provided with an adjustable gate or partition, substantially as and for the purpose stated.

5 5. In a starch-separator, the combination, with a vibrating sieve composed of two or more sections of bolting-cloth and one or more intermediate troughs or strips, and provided on its under side with a separate tray or
10 receptacle for each section of bolting-cloth, such tray or receptacle being provided with a suitable outlet and removably secured to such sieve, of a main trough for receiving the contents of the trays or receptacles, such trough
15 being provided with a series of adjustable gates or partitions, and having auxiliary troughs leading therefrom, each provided with an adjustable gate or partition, substantially as and for the purpose stated.

20 6. In a starch-separator, the combination, with the vibrating sieve having the sections b of bolting-cloth and the troughs or strips b' , of the independent trays or receptacles h , having the outlets h' removably secured to the under side of the sieve, as and for the purpose
25 stated.

7. In a starch-separator, the main trough p , located under the sieve, and provided with the adjustable gates or partitions p' , and having
30 the auxiliary troughs p^3 leading therefrom,

each having an adjustable gate or partition, p^4 , as and for the purpose stated.

8. In a starch-separator, the main trough p , located under the sieve, and provided with the adjustable gates or partitions p' , adapted by
35 suitable means to be operated from one side of the sieve, the main trough p being provided with auxiliary troughs p^3 , leading therefrom, each having an adjustable gate or partition, p^4 ,
40 as and for the purpose stated.

9. In a starch-separator, the combination of the sieve having the sections b of bolting-cloth, the troughs b' , and the trays or receptacles h , having the outlets h' , with the main
45 trough p , having the adjustable gates p' , and the auxiliary troughs p^3 , having the gates p^4 , substantially as and for the purpose stated.

10. In a starch-separator, the tray or receptacle h , having the converging sides h' , outlet
50 h^2 , flanges h^3 , and cross-bar h^4 , adapted to be removably secured in grooves in the sieve-frame, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GILBERT S. GRAVES.

Witnesses:

OTTO HODDICK,
W. T. MILLER.