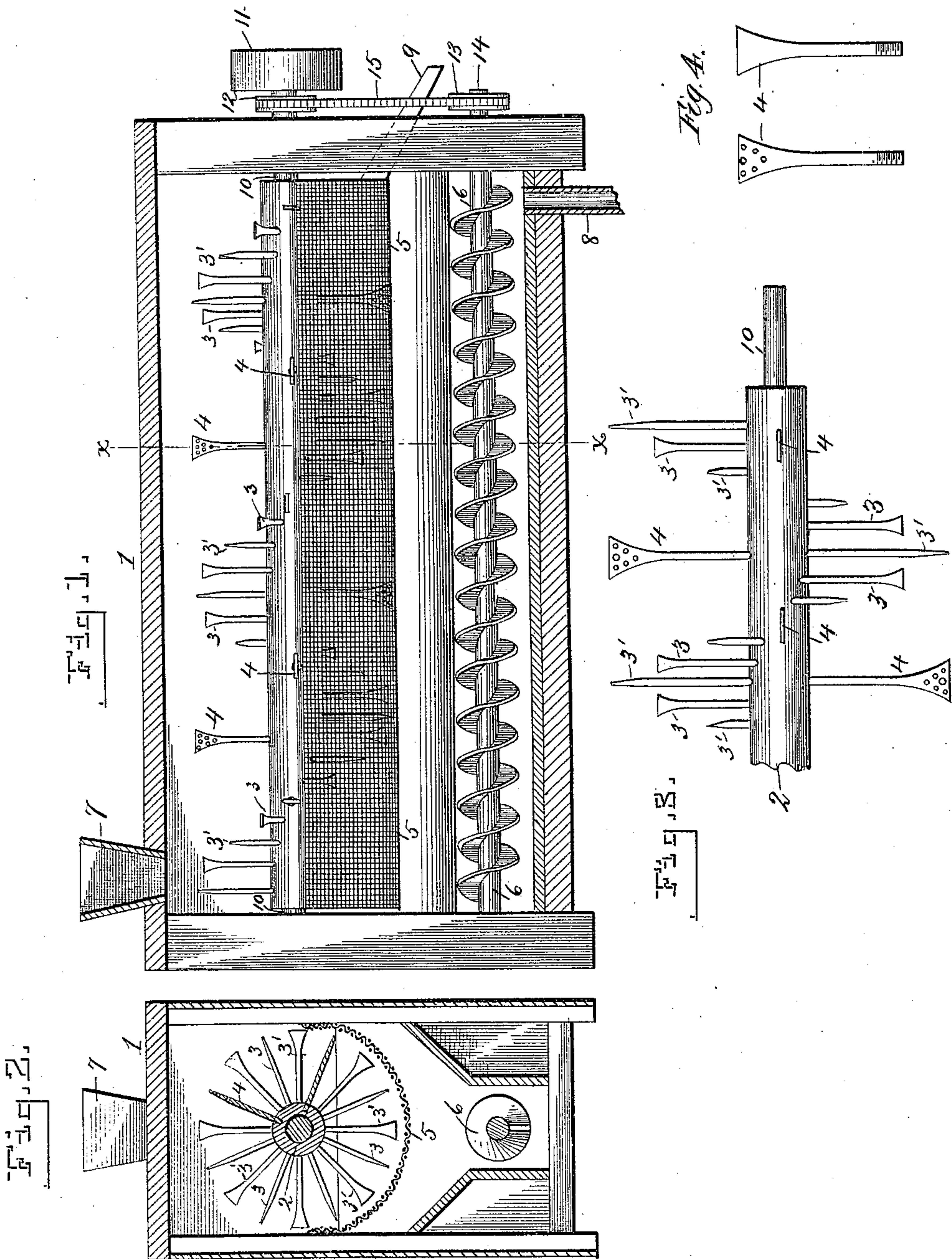


(No Model.)

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SEPARATOR FOR COTTON SEED OIL MILLS.

No. 440,981.

Patented Nov. 18, 1890.



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SEPARATOR FOR COTTON-SEED-OIL MILLS.

SPECIFICATION forming part of Letters Patent No. 440,981, dated November 18, 1890.

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To all whom it may concern:

Be it known that I, MARSHAL WALLACE, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Separators for Cotton-Seed-Oil Mills; 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.

My invention relates, generally, to that class of separators which are used in cotton-seed-oil mills and like places for the purpose of effecting the separation of broken hulls from the cotton-seed meal after the seed have been ground, and also the removal of such foreign materials as may have become mixed with said meal, and it relates particularly to certain improvements upon the separator for which Letters patent were granted to me July 12, 1887, No. 366,540; and it consists in the peculiarities of construction and arrangement or combination of parts hereinafter fully disclosed in the description, drawings, and claims.

It has been found from experience that a separator of this class, which is provided with a concaved screen and a shaft which only has one or more rows of spirally-arranged beaters and conveyers extending around its periphery in the same line or lines, will neither sufficiently retard the passage of the mixed cotton-seed meal and broken hulls nor agitate and screen them sufficiently to effect their perfect separation, but will cause a large quantity of the meal to be moved by and between the beaters and conveyers and carried to waste with the hulls through the discharge-chute at the rear end of the screen.

The object of my present invention is to overcome these objections with but slight change in the construction of my former separator, which I accomplish by an improvement of the shaft, which is provided with the spirally-arranged beaters and conveyers, and also with elevators arranged between the spiral lines of said beaters and conveyers, and by the combination thereof with a circular

or concaved screen, whereby a complete separation of the meal from the hulls and other foreign substances is effected. This object is accomplished by the construction and arrangement or combination of parts illustrated in the accompanying drawings, forming part of this specification, in which the same reference-numerals indicate the same parts, and in which—

Figure 1 represents a vertical longitudinal section of my improved separator for cotton-seed-oil mills, parts of the complete machine being omitted for clearness of illustration; Fig. 2, a transverse section of the same on the line *x x* of Fig. 1; Fig. 3, a broken detail side elevation of the shaft provided with my improvements, and Fig. 4 face views in detail of the elevators with and without perforations in their blades.

In the drawings the numeral 1 indicates the rectangular casing, within which is arranged the shaft 2, which is provided with the beaters 3, the conveyers 3', and the elevators 4, the concaved screen 5, and the conveyer 6, and which is provided in its top near its front end with the feed-hopper 7, in its bottom at the rear end of said conveyer with one or two discharge-chutes 8, through which the cotton-seed-meal is delivered into any suitable receptacle, and with the discharge-chute 9 at the rear end of said screen, through which the hulls and foreign matters are passed out of the machine.

The shaft 2 is preferably made of hard wood and provided at its ends with the metallic journals 10, which are mounted in suitable bearings in the ends of the casing 1, and also it is provided at its rear end with the power-receiving pulley 11 and the sprocket-wheel 12, from which the conveyer 6 is revolved by the sprocket-wheel 13 on the end of its shaft 14 and the endless sprocket-chain 15. All of the parts named, with the exception of the shaft provided with the elevators, constructed and arranged as now to be described, are of substantially the same construction and arrangement as the corresponding parts disclosed in my above-mentioned patent.

The shaft 2 is provided with one or more

rows of spirally-arranged metallic beaters 3 and conveyers 3', the inner ends of the shanks thereof being secured to said shaft by screw-threads or other suitable means, while their outer portions are flattened and formed into blades, which are arranged alternately parallel with and at right angles to the axis of their shaft, and which, as in my former separator, are respectively employed to beat and agitate the material against and over the inner surface of the full or carrying side of the screen, and at the same time to effect the passage or conveyance of said material toward the discharge end of said screen. As these beaters and conveyers are arranged in the same spiral line or lines around the shaft, it is evident that said beaters cannot elevate the material upon the screen above a line parallel with the axis of said shaft, as the blades of the conveyers, being arranged at right angles to those of the beaters, will counteract this effect by their spiral contact with the material in forcing the same along and over the inner surface of the screen. Hence, when the shaft and these parts are in revolution one side of the screen will be completely covered with the material, while the other side will be nearly empty and in proper condition for the action of the elevators, now to be described.

In order to improve and perfect the separation of cotton-seed meal from hulls and other foreign substances, I construct and suitably apply to the shaft 2 the series of elevators 4, which are also arranged spirally around said shaft, preferably at considerable distances apart, and are placed in the space between the spiral line or lines of beaters 3 and conveyers 3'. These elevators are formed with blades of the same shape as but broader or wider than those of said beaters and conveyers; also, their sides are all arranged parallel with the axis of said shaft, and they may be perforated or not, as shown in Fig. 4, as desired, or according to the character or condition of the materials being separated. There is no specific limit to the number of elevators employed or to their distance apart; but for the best results I prefer and recommend the use of four of them for each passage of the spiral line around their shaft, this number being sufficient to assist in effecting a very rapid and complete separation of the material under treatment. The functions or purposes of these elevators are, first, to lift or elevate a portion of the mixed meal and hulls from the full side of the screen and deliver them back upon its opposite or empty side, thereby causing them to travel a second time over the same screening-surface and to be thus subjected to repeated sifting, which results in nearer perfect separation than heretofore and in increased capacity of the machine, this being due to the fact that said elevators are formed with wider blades than the beaters and con-

veyers and that they are arranged in a spiral line in an open space between the spiral lines of said beaters and conveyers, whereby they are enabled to lift and throw their loads of material through this open space and over onto the empty side of the screen, and, second, to brush or sweep the inside of the screen with the ends of their broad blades for keeping its meshes open, so that the meal may easily pass therethrough without the necessity of using the brushes and the mechanism for operating them in my former machine for preventing said meshes from becoming clogged. As stated, the blades of these elevators may be formed either perforate or imperforate; but I usually prefer the former, as I find that a large quantity of the meal will not sift through their perforations until they are passing over the empty side of the screen, this being prevented by pressure of the air upon their rising surfaces during their revolution, which causes them to retain their loads of material until they reach the empty side of the screen. After leaving this point, and while passing through the mass of material on the opposite or full side of the screen, their beating action or attrition is also very great, resulting in greatly increasing the amount of meal forced through the screen over that which results from the use of the beaters only; also, as the meshes of the screen are always open just behind the lines of movement of these elevators, such meal as is sifted through their perforations drops directly through said screen and passes to the conveyer below.

I am aware that a shaft provided with spirally-arranged beaters and conveyers is not new, and also that circular or concaved screens are not new, and therefore I do not claim the same separately; but I do so claim the shaft herein disclosed, as it is not only adapted and partly intended to be made and sold separately, but actually has been and is even now being employed with success and satisfaction in a large number of the separators manufactured under the construction shown and described in my former patent, and also it is capable of advantageous use in other analogous separators.

Having thus fully described the construction and arrangement or combination of the parts of my invention, with its advantages and operation, what I claim as new is—

1. In a separator for cotton-seed-oil mills, a shaft provided with spirally-arranged beaters and conveyers arranged in the same line or lines, and also with elevators arranged between the spiral lines of said beaters and conveyers, substantially as and for the purpose described.

2. In a separator for cotton-seed-oil mills, a shaft provided with spirally-arranged beaters and conveyers arranged in the same line or lines, and also with perforated elevators arranged between the spiral lines of said beaters

and conveyers, substantially as and for the purpose described.

5 3. In a separator for cotton-seed-oil mills, the combination, with a shaft provided with spiral lines of beaters and conveyers arranged in the same line or lines, and also with elevators arranged between the spiral lines of said beaters and conveyers, of a circular or con-

caved screen, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

MARSHAL WALLACE.

Witnesses:

J. H. BILHEIMER,

J. C. KINKEOD.