

(No Model.)

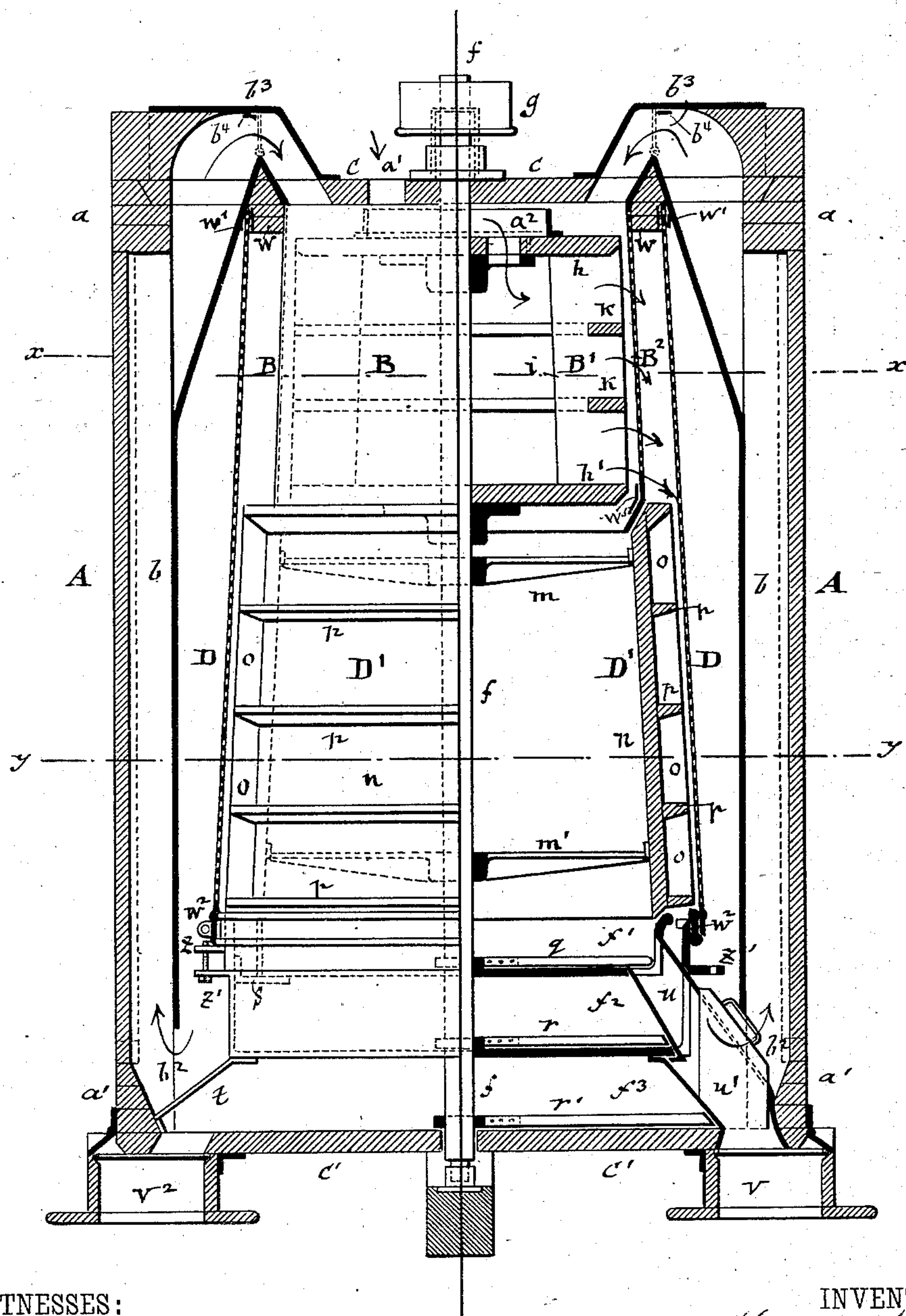
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M. MARTIN.
FLOUR BOLTING MACHINE.

No. 315,308.

Patented Apr. 7, 1885.

Fig. 1.



WITNESSES:

For. N. Rosenbaum.
Carl Karp

INVENTOR

Moritz Martin
BY
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ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

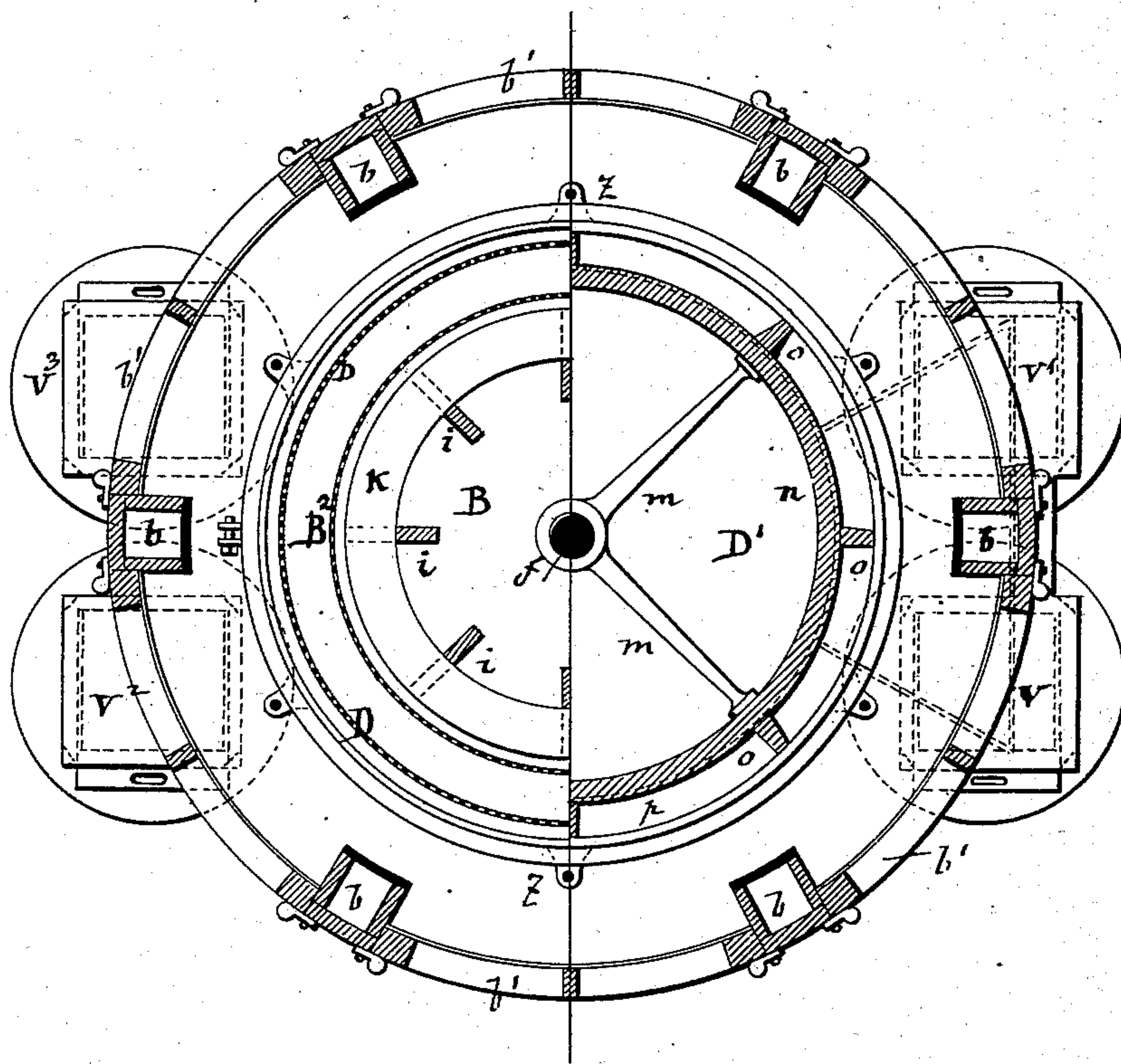
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Fig. 2.



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UNITED STATES PATENT OFFICE.

MORITZ MARTIN, OF BITTERFELD, PRUSSIA, GERMANY.

FLOUR-BOLTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 315,308, dated April 7, 1885.

Application filed October 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, MORITZ MARTIN, of Bitterfeld, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Flour-Bolting Machines, of which the following is a specification.

Repeated attempts have been made to construct a good vertical centrifugal flour-bolting machine, as the same possesses theoretically the following advantages: first, economy of space, as the vertical bolting-machines take up considerably less floor-area than the horizontal bolting-machines; second, economy of power, as the meal to be bolted has not to be lifted and as the bolting-reel does not require to be rotated; third, a better bolting, as a more uniform distribution of the material to be bolted is produced on the bolting-surface; fourth, greater durability of the bolting-cloth, as with a better distribution of the meal the cloth is acted upon in a more uniform manner and as the disadvantageous crowding of the meal cannot take place as easily as in horizontal bolting-machines; fifth, a simpler and consequently cheaper construction. Practical tests, however, have shown that the vertical bolting-machines possess besides the advantages mentioned a number of disadvantages, so that hitherto in practice the horizontal bolting-machines have been preferred.

It formed one of the objections to vertical flour-bolting machines that without absolute uniformity in the revolutions a partial closing of the meshes of the bolting-cloth and consequently unequal bolting took place. When the speed of the machine slackened, the bolting action ceased entirely, as by the gradually diminishing centrifugal force the meal was not thrown with sufficient force against the bolting-cloth, so that it dropped without being bolted, even when the revolving cylinder or drum is provided with shelves, in which case the meal is dropped from shelf to shelf without being properly exposed to the bolting action. With a too rapid movement of the drum or cylinder the air in the reel-chest was compressed by the gradual introduction of new quantities of air to such a degree that the fine particles of flour were prevented from passing freely through the bolting-reel. The horizontal bolting-machines are not so easily affected by differences of speed, as with the

slower motion the meal is collected in heavier layers at the lower part of the bolting-reel, so that a more effective bolting takes place, while at higher speed the air-pressure in the reel-chest is easily overcome, because the chest is generally made of considerable size and because the increased air-pressure is more easily overcome by the weight of the material that is forced against the bolting-cloth.

The object of this invention is to overcome the disadvantages of the vertical bolting-machines and to furnish an improved construction in which the air-pressure is uniformly distributed within the machine, and in which the bolting operation is facilitated by a preparatory bolting operation, which takes place before the meal passes into the bolting-reel proper.

In the accompanying drawings, Figure 1 represents a vertical central section of my improved flour-bolting machine, showing one half of the revolving drum in side elevation and the other half in section; and Fig. 2 is a horizontal section of the machine, one half being drawn in section on line *x x*, the other half on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

A in the drawings represents the reel-chest, which is composed of horizontal top and bottom rings, *a a'*, which are rigidly connected with each other by hollow vertical pillars *b b'*. The top ring, *a*, is closed by a cover, *c*, and the bottom ring, *a'*, by a bottom, *c'*, which latter is provided with openings for the channels that convey the bolted and unbolted material from the interior of the reel-chest to the outside. Between the upright pillars *b*, which are made of rectangular cross-section, are arranged detachable sections or doors *b'*, that are made of wooden frames, which are covered with widely-meshed felt or flannel.

The central driving-shaft, *f*, of the machine is supported in the usual manner by a step and neck bearing, of which the step-bearing is supported on a piece of cross-timber, *C*, while the neck-bearing is supported on the cover *c*.

To the shaft *f* are attached the following parts, which partake of the rotation of the same: At the upper end the driving-pulley *g*, and below the same at the inside of the

reel-chest, the revolving drum B' of the preparatory bolt B, which drum is made of two horizontal disks, $h h'$, vertical beaters i , and two or more intermediate rings, $k k$, as shown clearly in Figs. 1 and 2. Below the drum of the preparatory bolt is arranged the drum D' of the main bolting cylinder or reel D, said drum being made in the form of a truncated cone, and composed of two spider-frames, $m m'$, which support the conical shell n that is provided at its outer surface with vertical beaters o and horizontal shelves p that are composed of ring-segments, which are secured to the conical shell n of the revolving drum D'.

Below the drum D' of the main bolting-reel D the shaft f carries a horizontal scraper, q , that moves along the bottom of the uppermost receiving-pan, f' . Below the pan f' a second scraper, r , moves the meal that has not passed through the bolting-reel along the bottom of an intermediate receiving-pan, f^2 , while a third scraper, r' , below the pan f^2 , moves the sifted flour along the bottom of the reel-chest. The pans $f' f^2 f^3$ are arranged concentrically with and vertically one below another, and are provided with openings in the center, through which the shaft f is passed. The pans are connected with each other by angle-irons s , and with the bottom ring, a' , of the reel-chest by inclined angle-irons t . The receiving-pans $f' f^2 f^3$ are made of cast-iron or wrought-iron with zinc rims and wooden bottoms. The upper and intermediate pans, $f' f^2$, communicate by channels $u u'$ with vertical trunks $v v'$, through which the bran and meal which are collected by the scrapers q and r are conveyed off. The sifted flour is conducted off at the opposite side of the bottom of the machine by two trunks, $v^2 v^3$, which communicate with openings in the bottom of the reel-chest.

To the inner surface of a fixed ring, w , at the under side of the cover c , is secured the bolting-cylinder B² of the preparatory bolt B, which cylinder is made of perforated or slotted sheet metal. The perforated cylinder is also made in the shape of a truncated cone, in the same manner as the revolving drum B' of the preparatory bolt B. The lower end of the perforated sheet-metal cylinder B² is bent inwardly and riveted to an angular-iron stiffening-ring, w^5 . The outer surface of the fixed ring w is provided with a circumferential groove in which the bolting-cloth of the main reel D is retained by a steel band, w' , which is tightly applied around the ring w . The lower end of the bolting-cloth is applied by a metal ring, w^2 , to a cylindrical extension of the intermediate receiving-pan, f^2 , the outer surface of which extension is carefully turned off. The ring w^2 is also grooved, and the bolting-cloth attached to the groove by a steel band in the same manner as at the upper end.

To properly stretch the bolting-cloth, so that it assumes the form of a truncated cone concentric to the revolving drum D', the lower ring, w^2 , is provided with ears z , through which and similar ears, $z' z'$, of the extension

of the receiving-pans f^2 are passed a number of screw-bolts, by means of which the ring w^2 can be adjusted, so that the bolting-cloth may be more or less tightly stretched. It forms, therefore, a fixed bolting-reel, which comes into action when the preparatory bolt B has performed its function of collecting the meal to be bolted and conducting it to the main bolting-reel. As the upper part of the bolting-cloth is not called into action, it may be made of linen instead of silk cloth.

The truncated form of the preparatory bolt and main bolting-reel has for its object to prevent the too quick dropping of the meal and the crowding of the same in the bolting-reels when the machine runs at slower speed. This is an essential feature, as thereby the regular working of the bolting-machine is secured even with variations of speed.

The air that assists in the bolting operation is introduced through an opening, a' , of the cover c , and an opening, a^2 , in the top disk, h , of the preparatory bolt, and conducted through the latter and the main bolting-reel to the lower part of the reel-chest. The air in the preparatory bolt and the main bolting-reel is taken up by the beaters and assists in the bolting process. The air which is continually drawn into the machine would soon be compressed in the lower part of the reel-chest if no egress were provided for the same, and it would thereby have a tendency to retard instead of assist the bolting operation. The too great accumulation and pressure of the air are partly prevented by the construction of the doors or sections of the reel-chest, which are made of loosely-meshed fabric through which some of the air can pass off to the outside; but as the covering fabric retains the particles of flour carried along by the air, said particles close up in course of time the meshes of the fabric and cannot be entirely removed therefrom even by beating or shaking the frame, especially when flour from wet grain is bolted. It is therefore necessary to furnish other means of eduction for the compressed air, for which purpose the hollow pillars $b b$ are used and provided at their lower ends with openings b^2 through which the air passes in upward direction in the pillars, whereby a uniform expansion and distribution of the air takes place, so that the injurious pressure of the same is avoided. As, however, the air in the reel-chests is always impregnated with particles of flour, which is especially the case when larger quantities of air are drawn in, which has to be regulated for quicker or slower bolting by regulating the size of the induction-opening a' , it is unavoidable that some of the particles of flour are carried along through the pillars b . To prevent this as much as possible, the pillars b are provided at their highest points with valves b^3 , which are composed of small pieces of flannel in a suitable frame that are pivoted in such a manner that they open like flap-valves to a greater or less degree toward the

air-induction opening a' according as the pressure of air is greater or smaller, the said valves being weighted so that they normally rest against the stops b^4 , being opened by the pressure of the air passing up through the pillars, and presenting an inclined surface against which the flour particles impinge and fall back into the channel, being collected and again passed through the bolting-reels. The air which escapes through these regulating-valves b^3 is conducted to the preparatory bolt B, where it mingles with the air drawn in from the outside. This carrying along of the flour particles with the air takes place only with a strong and quick bolting, and then to the extent of a very small percentage only. This rebolting of the flour particles carried along forms but a small disadvantage, as the main desideratum—namely, the compression of the air in the reel-chest—is prevented and regulated, whereby a very effective working of the vertical bolting-machine is obtained.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a flour-dressing machine, of a vertical main cylinder in the form of a truncated cone, a rotary main bolting-reel within said cylinder, a preparatory bolting-cylinder concentric to the main bolting-cylinder above said main bolting-reel, and a preparatory rotary bolting-reel within said preparatory bolting-cylinder, substantially as described.

2. The combination, in a flour-dressing machine, of a vertical main bolting-cylinder in the form of a truncated cone, a rotary conical main bolting-reel within said cylinder provided with vertical beaters and circumferential shelves, a preparatory vertical conical bolting-cylinder concentric to the main bolting-cylinder above said main bolting-reel, and a preparatory conical rotary bolting-reel within said preparatory bolting-cylinder provided with vertical beaters and circumferential shelves, substantially as described.

3. The combination, in a flour-dressing machine, of an inclosing-case provided with a feed-opening in its top, a main vertical conical bolting-cylinder within said case, a conical preparatory bolting-cylinder within said main cylinder, a rotary preparatory bolting-reel within said preparatory cylinder and below said feed-opening, a main bolting-reel within said main bolting-cylinder and below said preparatory bolting-reel, and vertical and inclined channels connecting the lower part of said main bolting-cylinder with the upper part of said preparatory bolting-cylinder, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MORITZ MARTIN.

Witnesses:

EDUARD PAJEMANN,
OTTO GENSCHER.