(No Model.) 2 Sheets—Sheet 1.

J. G. HINTZ, Jr.

BOLTING MACHINE.

No. 597,412. Patented Jan. 18, 1898.

Fig. 2.

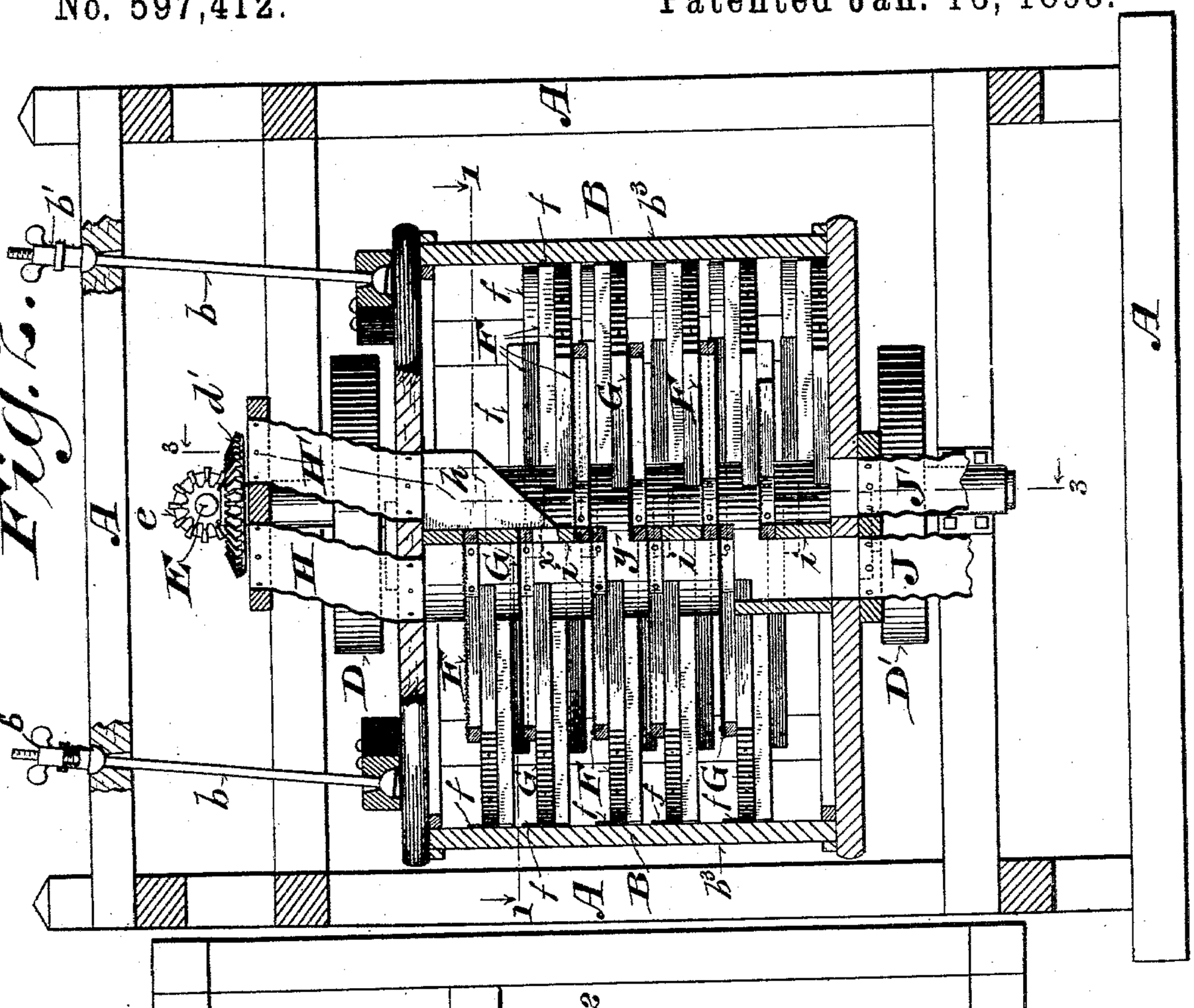
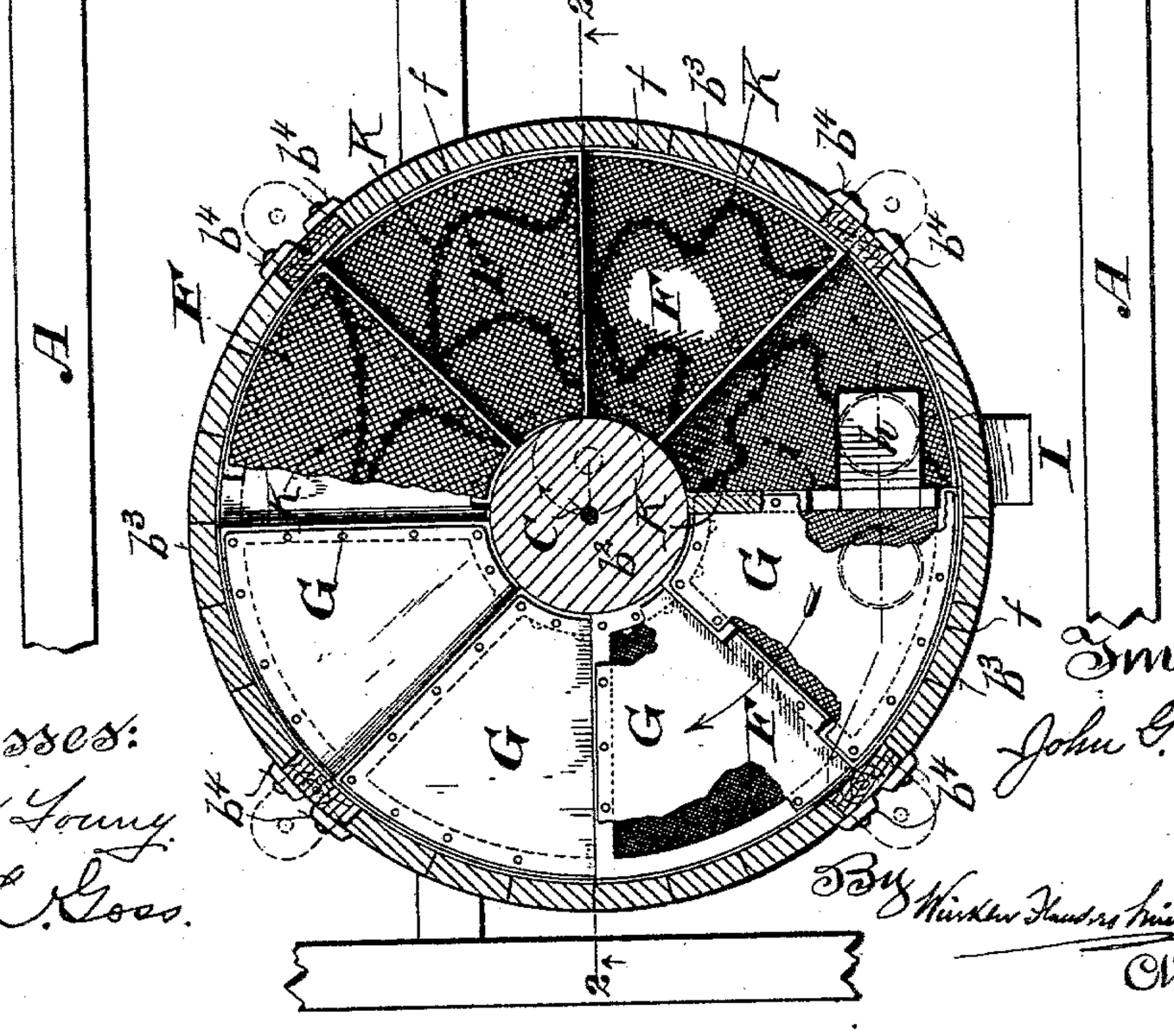


Fig. 1.



Witnesses:
Geo. W. Young.
Chas. L. Goss.

Inventor:
John G. Hintz Jr.
By Wickes Hendricks Smith Bottum & Wickes
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

J. G. HINTZ, Jr.

BOLTING MACHINE.

No. 597,412. Patented Jan. 18, 1898.

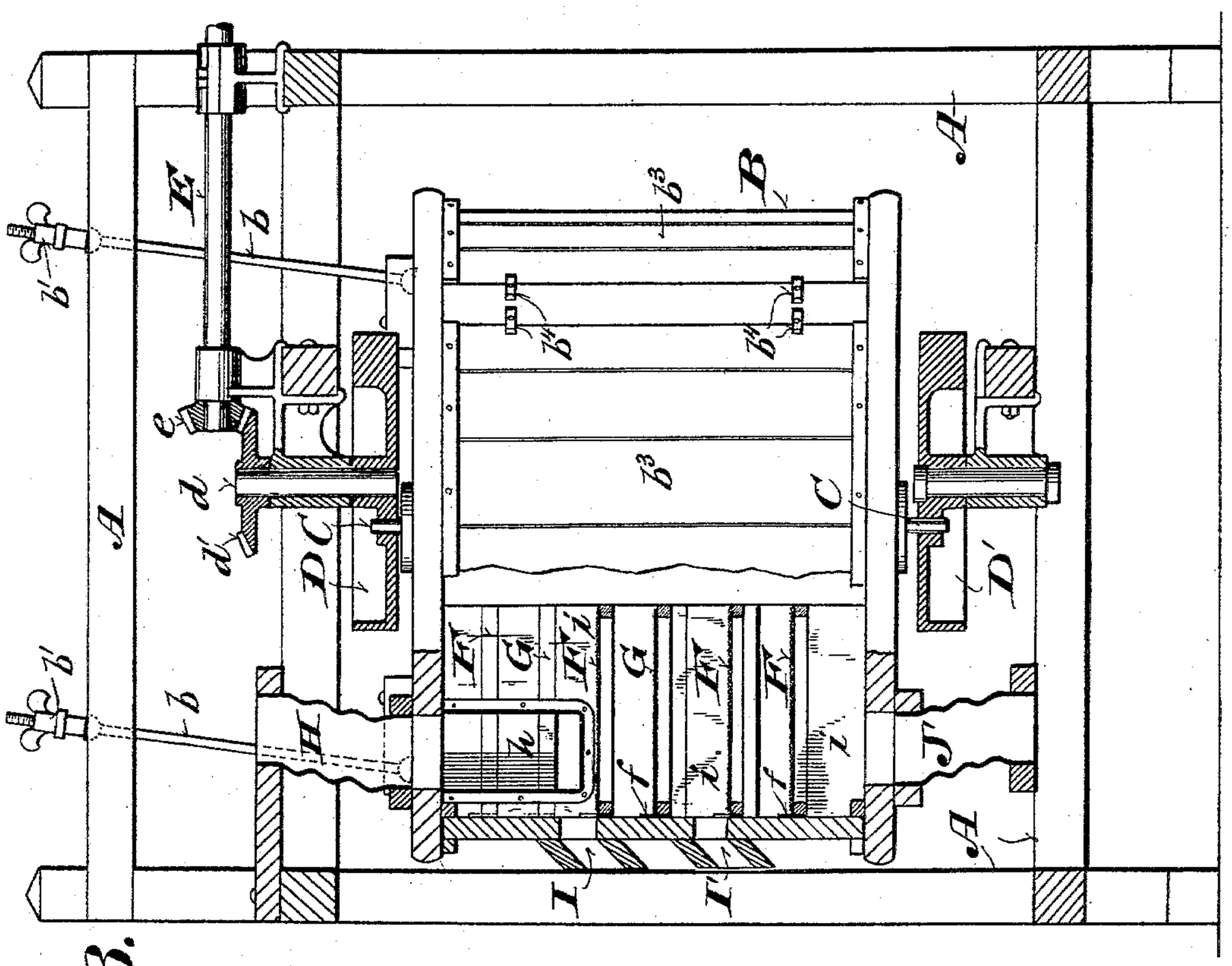


Fig. 3.

Witnesses:
Geo. W. Young.
Chas. L. Goss.

Inventor:
John G. Hintz, Jr.

By Wheeler Flanders Smith Bottum & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN G. HINTZ, JR., OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE EDWARD P. ALLIS COMPANY, OF SAME PLACE.

BOLTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,412, dated January 18, 1898.

Application filed October 31, 1894. Renewed June 8, 1897. Serial No. 639,910. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. HINTZ, Jr., of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Bolting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main object of my invention is to provide a machine of large capacity and capable of a variety of sifting operations within a small compass.

It consists, essentially, of a gyrating case provided with a series of substantially horizontal sieves arranged one below another in a spiral series, the tail of each sieve being open and projecting over the head end, which is closed, of the next succeeding sieve of the series, and of certain novel features in the construction and arrangement of the component parts of the machine, as hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a horizontal section of a machine embodying my invention in a plane indicated by the dotted line 1 1, Fig. 2. Fig. 2 is a vertical section in a plane indicated by the dotted line 2 2, Fig. 1; and Fig. 3 is a partial vertical section on the line 3 3, Fig. 2, and side elevation of the machine.

A designates the frame, which is of any suitable shape and material, to support the moving parts of the machine.

B is a casing of circular form in horizontal section, and suspended, as shown in Fig. 2, by hangers *b b* from frame A, so as to permit of a gyrating or circular movement of said case around its vertical axis. The hangers *b b* have ball-and-socket or universal-joint connections with said frame and case and are provided with adjusting-nuts *b' b'* for leveling the case. The shaft C extends axially through the case, projecting therefrom at either end. Above and below the case are crank or fly wheels D and D', mounted on vertical shafts in line with each other and engaging the ends of shaft C, which serve as crank-pins. The shaft *d* of the upper crank-wheel is provided with a bevel-gear *d'*, which meshes with a similar gear or pinion *e* on a horizontal driving-shaft E. Through these connections a gyrating movement is imparted to the case or sieve-frame B, the lower fly-wheel D' serving to guide it at the bottom and to insure a like and steady movement at both top and bottom.

F F are sector-shaped sieves arranged in a spiral series within the case B around a central post or column b^2, the tail end of each sieve projecting over the head end of the next succeeding sieve, so as to discharge its tailings thereon, the several sieves being arranged in parallel horizontal planes.

The number and arrangement of the sieves and the feeding and discharging connections may be changed so as to perform any one or number of a great variety of sifting operations in the same machine.

For the purpose of illustration I have shown a machine in which the sieves and feeding and discharging connections are arranged to operate simultaneously upon two breaks and to grade the siftings of both breaks. For this purpose a closed bottom is provided, composed of sections G G, like or similar in shape and arrangement to the sieves, or made in the form of a continuous spiral.

H and H' are the feed connections, which in this instance consist of flexible tubes secured at their lower ends in openings in the top of the sieve-case. The first opens upon the upper sieve of the first series, and the second into a pocket *h*, which opens at *x*, Fig. 2, upon the sieve next directly below the first sieve of the series.

I I' designate lateral discharge-spouts for the tailings of the first and second breaks, respectively, and J J' are discharge connections, in this instance consisting of flexible tubes secured at their upper ends in openings in the bottom of the sieve-case. The first is for the tailings of the siftings of the first and second breaks and the second for the siftings of the siftings of both breaks. The siftings of the first break are deposited upon the sec-

ond series of sieves at *y*, Fig. 2, and are mingled with the siftings of the second break. It is obvious that either the tailings or the siftings may be intercepted by radiating partitions, such as *i i*, and discharged through lateral openings, such as I I′, in the case at any desired point or points in the series of sieves or closed bottom sections.

To afford ready and easy access to the interior of the machine and the sieves, the sides of the case are formed in doors or removable panels b^3 b^3, which are engaged at the edges and held in place by buttons b^4 b^4, as shown in Figs. 1 and 3, or by other suitable fastenings.

To prevent the escape of material from the outer edges of the sieves and bottom sections when the sides of the case are removed, said sieves and bottom sections are provided on their outer edges with guards *f f*.

To keep the wire or cloth of the sieves open and clear, I provide chains K K, which are attached at the ends to the inner and outer sides of the sieves near their tail ends and are attached at an intermediate point to or near the head ends of the sieves, so as to lie loosely upon and sweep freely over their upper surfaces, as shown in Fig. 1.

By means of the form of the casing and the arrangement of the sieves therein in connection with means of imparting a gyrating movement I am enabled not only to perform in one machine various bolting operations simultaneously, but also to constantly utilize the entire area of the sieves and thus economize space, it being practicable, according to my plan, to construct a machine of large capacity that will occupy a comparatively small floor-space by extending its vertical dimensions.

As hereinbefore stated, the number, shape, size, and arrangement of sieves, as well as of the closed bottom sections, and the number and arrangement of the feed and discharge connections and other details of the machine may be variously changed, according to the kind and amount of work to be done, and I do not wish to be understood as limiting myself to the specific construction and arrangement of the component parts of the machine herein shown and described, nor to the operation of the machine on any particular kind of material.

While these features admit of variation, as indicated, I find it of advantage to give to the outer boundaries of the sieves a continuous curve, or to avoid any well-defined angles or pockets in which the stock or its component parts might lodge. The circular path in which the casing moves causes the stock to travel in a substantially cylindrical path, the effect being closely similar to that of hand-sifting, while the tail of each sieve projecting over and resting upon the head of the next precludes a backward movement of the stock at each of said points and causes the material to be thrown forward more effectively than it would be were a smooth or continuous spiral sieve employed without these steps or upright faces. It is found that in actual operation the upright faces thus formed serve to shake up and loosen the stock and to cause those particles which might otherwise remain as a distinct layer on the top of the mass to find their way to the surface of the sieve itself and in great part to pass through its meshes. By this construction I avoid the use of pocketed ribs, bars, or walls, such as have been proposed, and I obviate the difficulty attending the use of such pockets—the accumulation and lodging of material in them.

Rectangular sieves do not give the same efficient action as the circular sieve for the reason that the material tends to work into and to remain in their corners or angles, becoming in time musty and liable at any moment to be loosened and to move forward in a compact mass, thus interfering with the proper action of the sieves and in some cases mixing old and musty stock with the fresh stock under treatment. The cylindrical form produces a continuous smooth outer wall of easy curve, preventing any lodging of the stock.

It will be observed that while there is a bodily movement of the casing with its sieves and carrier-boards in a circular path there is no rotation of the casing about its axis. A mere rotation or oscillation about a point within the sieve boundaries will not produce the action required.

Each sieve or section being wholly unobstructed at the tail and being as wide at that point as the head of the next succeeding sieve, the tailings from one are delivered in a thin sheet to the next across its entire width, thus avoiding the massing or banking up of the material at one point, as is the case where the material is tailed off from one sieve to another through a spout. In such latter case the discharge is obstructed and slow and the feed to the succeeding sieve is concentrated at one point, requiring considerable time to effect a distribution over the sieve and precluding complete utilization of the sieve-surface.

The sieves being each provided with a guard or raised outer wall, it is practicable to remove the doors or sections of the casing extending from top to bottom and to take out any sieve or sieves without causing or permitting the stock to escape at the outer edges of the sieves, at which point there is generally a somewhat heavier layer than elsewhere.

I claim—

1. In a sifting-machine, the combination of a suitable case; substantially horizontal sieves arranged therein in a spiral series, each sieve having a raised wall or abutment across its head, and having its tail or delivery end unobstructed, the tail of each sieve being arranged above the head of the next and to deliver its tailings across the entire width thereof; and means substantially such as shown for imparting a horizontal motion to the cas-

ing in a circular path, without rotation about its own axis.

2. In a bolting-machine, the combination of a cylindrical casing; a number of substantially sector-shaped sieves having their frames overlapping and resting one upon another, whereby the tail of each is made to serve as an upright wall or abutment for the head of the next; and means substantially as described and shown for imparting a horizontal movement to the casing in a circular path, without rotation about its own axis.

3. In a bolting-machine, the combination of a cylindrical case and a number of substantially horizontal sector-shaped sieves arranged therein in a spiral series, the tail ends of the upper sieves being open and each projecting over the head end which is closed of the next succeeding sieve, and means of imparting a gyrating movement to the sieves, substantially as and for the purposes set forth.

4. In a bolting-machine, the combination of a casing provided with one or more discharge-openings; means for imparting to said casing a horizontal movement in a circular path; a number of substantially horizontal sieves arranged within said casing in a spiral series, the tail of each resting upon the head of the next below and delivering its tailings across the width of the lower sieve; and one or more cut-offs or partitions extending across the sieves opposite the discharge-openings, substantially as and for the purpose set forth.

5. In a bolting-machine, the combination of a case provided with lateral discharge-openings; a number of substantially horizontal sieves inclosed therein and arranged in a spiral series, the tail of one forming an abutment over which the tailings fall to the head of another; a closed bottom extending beneath a portion or all of said sieves in spiral form; cut-offs or partitions extending across the sieves and across the bottom opposite their respective discharge-openings in the case; and means for imparting a circular horizontal movement to the case.

6. In a bolting-machine, the combination of a cylindrical casing provided with a central post and with lateral discharge-openings; a number of substantially horizontal removable sieves arranged in spiral series about said post and extending outwardly therefrom to the casing; a closed bottom extending in spiral form beneath the sieves; cut-offs or partitions extending across the sieves and across the bottom opposite their respective discharge-openings; and means substantially such as described and shown for imparting horizontal motion to the casing in a circular path.

7. In a bolting-machine, the combination of a casing provided with a central post or column; sieves extending horizontally from said post to the outer walls of the casing, and arranged in a descending spiral series, with the tail of each extending across and forming an upright wall for the head of the next sieve below; and means substantially as described for imparting a horizontal movement to the casing in a circular path.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN G. HINTZ, JR.

Witnesses:
CHAS. L. GOSS,
F. W. KELLY.