

(No Model.)

C. H. W. FOSTER.  
APPARATUS FOR SIFTING SUGAR.

No. 350,532.

Patented Oct. 12, 1886.

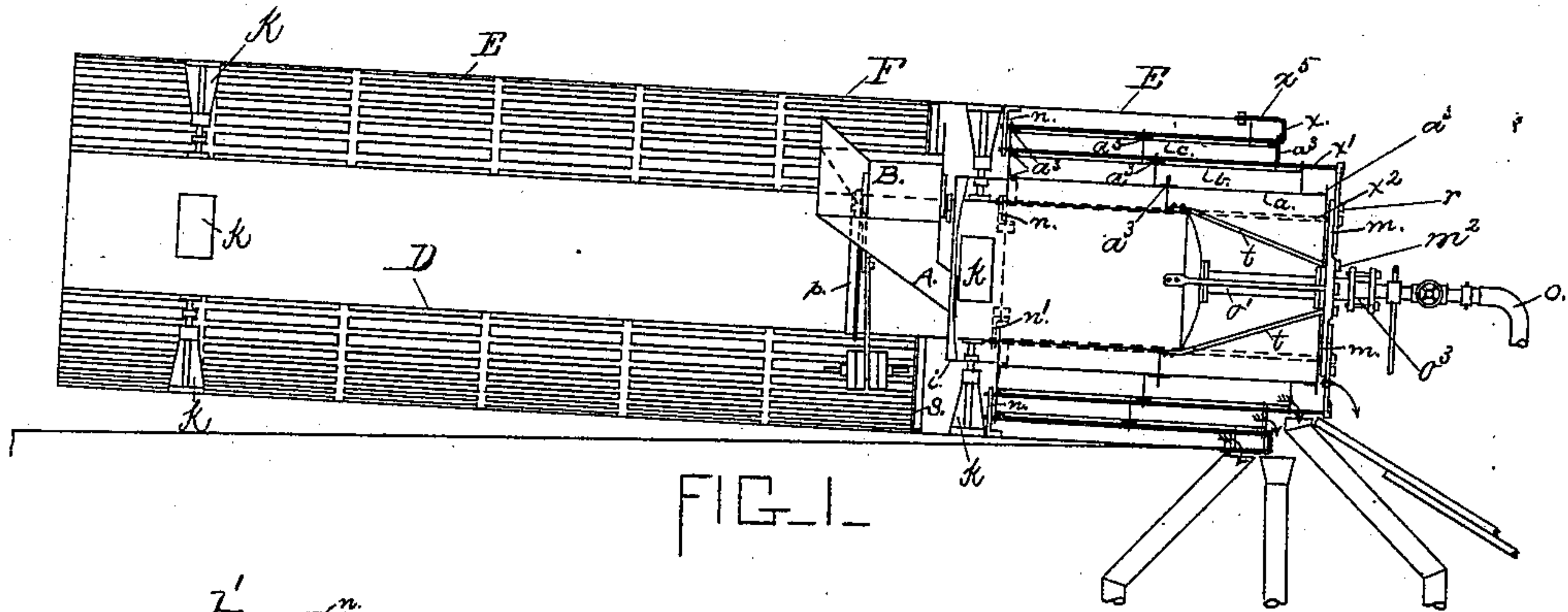


FIG. 1.

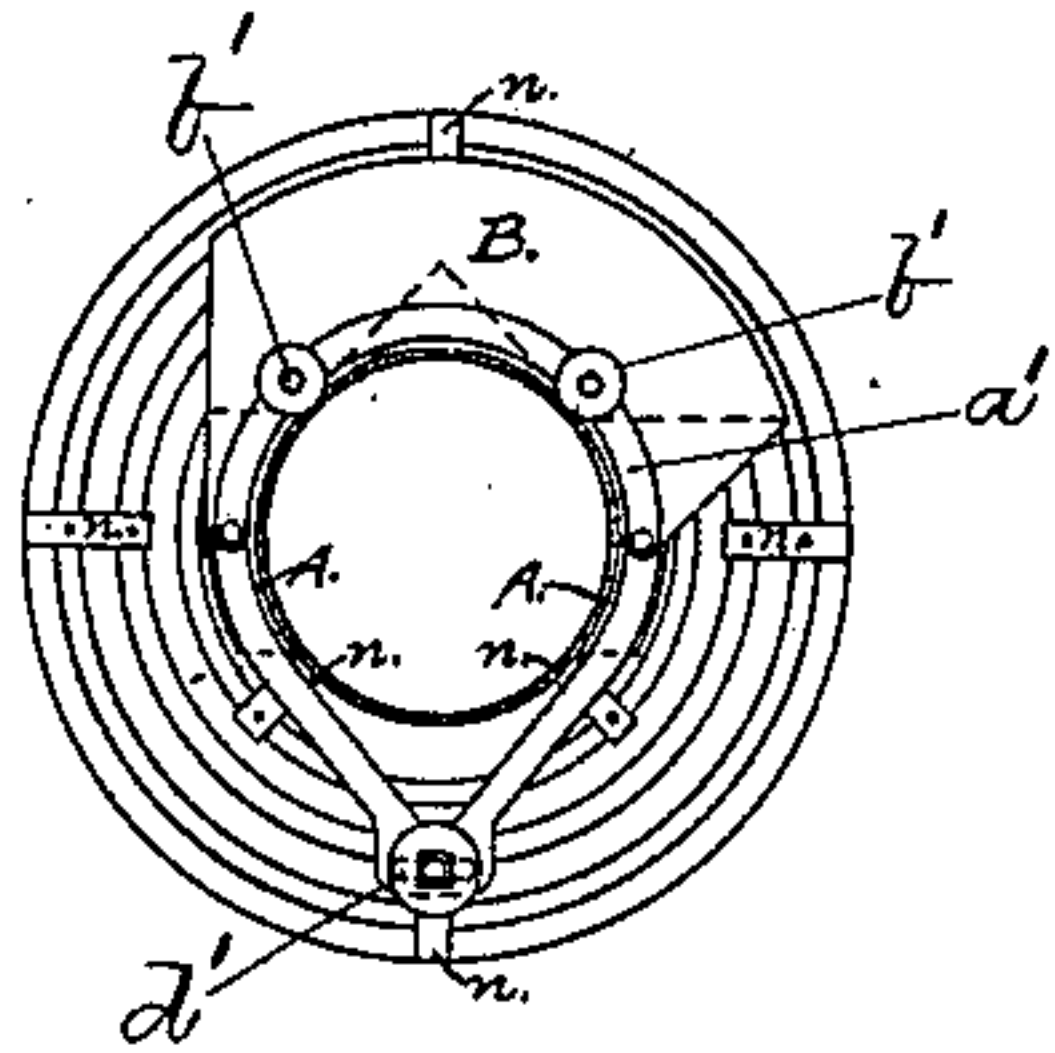


FIG. 2.

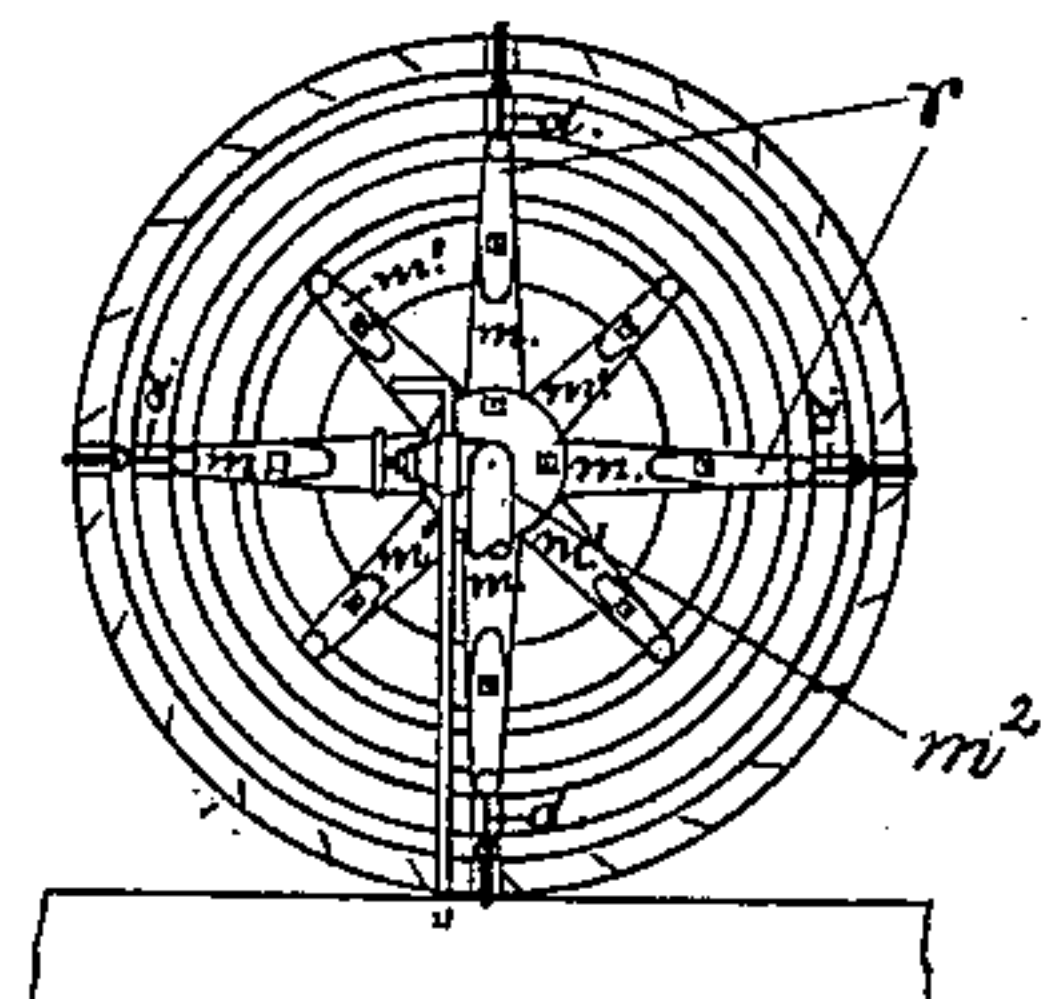


FIG. 3.

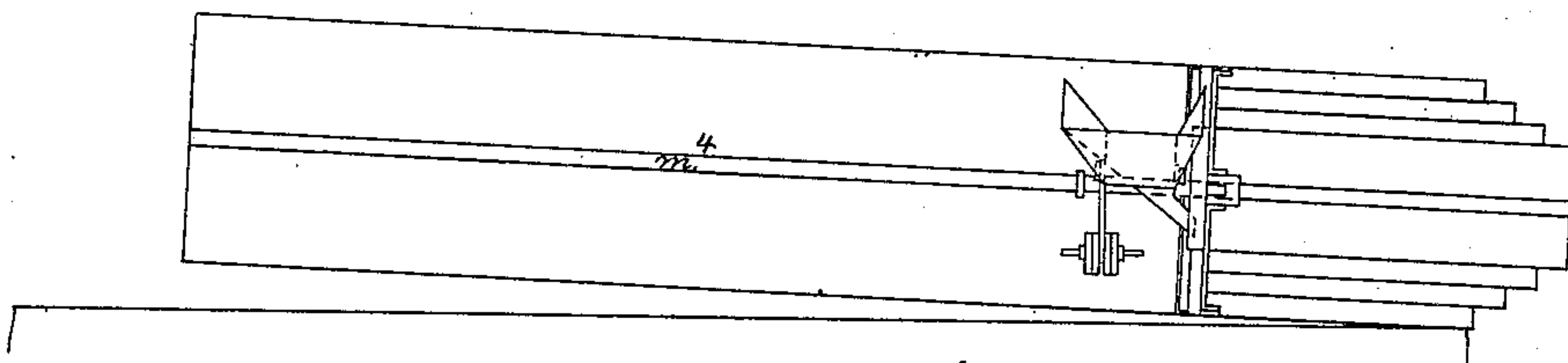


FIG. 4.

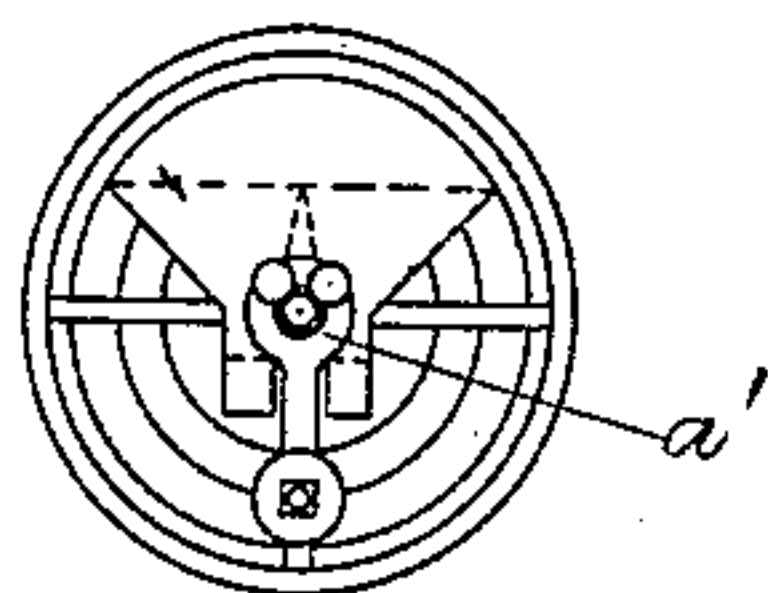


FIG. 5.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR SIFTING SUGAR.

SPECIFICATION forming part of Letters Patent No. 350,532, dated October 12, 1886.

Application filed April 1, 1886. Serial No. 197,387. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. W. FOSTER, of Brookline, county of Norfolk, State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Sifting Sugars or other Substances, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof, in which—

Figure 1 is a longitudinal section of a drying-cylinder with my improved sifting apparatus attached. Fig. 2 is an end view from the left of Fig. 1. Fig. 3 is an end view from the right of Fig. 1. Fig. 4 is a view of my improved apparatus as applied to another form of granulator or drier in use in sugar-manufactories. Fig. 5 is an end view of Fig. 4 from the left, designed to show the method of mounting the hopper apparatus in a drier like that shown in said Fig. 4.

The apparatus at present commonly employed in sugar-manufactories for separating the different-sized crystals of granulated sugars consists of a revolving cylinder or bolter covered with wire-cloths of different mesh sewed together, the finest being placed at the end of the cylinder next the feed where the sugar is received, and the coarsest at the discharge end. The cylinder is slightly inclined, and as it revolves the sugar works down toward the lower end, and as it reaches that portion of the sieve-covering having meshes large enough to allow it to pass through drops into the mouth of a receiving-spout, placed beneath and is discharged into a receptacle below. This method is deficient in that part of the fine sugar is carried over and discharged with the coarser, and the apparatus is also difficult to repair.

My invention has for its object the construction of a sifting apparatus which shall perfectly separate the different sizes of sugar, and which shall at the same time admit of taking one sieve out without disturbing the others; and it consists of a series of cylindrical revolving sieves of different-sized mesh placed one within the other, and arranged with a hopper by which the material to be separated is discharged onto the coarsest sieve, which is placed inside the others, the finest sieve being outside. I prefer to construct it, as shown, on the discharge end of the cylinder of a drier

or granulator; but this is not essential or necessary.

I will describe my apparatus having reference to the drawings, in which like letters indicate like parts throughout. E is the cylinder of a drier, and D is a steam-chest placed within the same, onto which the sugar is dropped as the cylinder E revolves in the well-known manner. The construction and operation of these parts being familiar to those skilled in the art, I do not deem it necessary to describe them in detail. As the sugar works downward to the lower division, F, of the drier, it is prevented from going farther by a rim or flange, S, secured to the cylinder E, and projecting inwardly, and as the cylinder revolves the sugar which has reached this part F thereof is carried up and dropped into a hopper, B, which does not revolve, but is suspended on a yoke,  $a'$ , (see Fig. 2,) which is hung on the steam cylinder D, the yoke being provided with grooved rolls  $b'$ , which ride on a flange,  $p$ , secured to the cylinder D, to receive them. The yoke  $a'$  is provided below the cylinder with a weight,  $d'$ , sufficient to counter-balance the hopper B and keep it in an upright position above the steam-cylinder D. The hopper B discharges through a spout, A, into a coarse sieve,  $a$ , of cylindrical shape, which is placed inside another cylindrical sieve,  $b$ , of finer mesh, which in turn is inside still another cylindrical sieve,  $c$ , of still finer mesh. These sieves are supported as follows: On the inside of the cylinder E are secured four or more braces,  $n$ , equidistant from each other, and provided with holes to receive the ends of the rods  $x x' x''$ , which form the frame-work of the sieves. The rods  $x$ , which support the outer sieve, are long enough to project slightly beyond the cylinder E, and their outer ends are bent backward, as shown at  $x^5$ , Fig. 1, and secured in a suitable manner to the end of the cylinder. The rods  $x'$ , which support the middle sieve, are also set at their inner ends in holes in the braces  $n$ , while their outer ends project beyond the bent ends of rods  $x$ , thus allowing the middle sieve to be somewhat longer than the outer one, and so discharge its contents into a separate receiving-spout set outside of the receiving-spout of the outer sieve. (See Fig. 1.) The outer ends of rods  $x'$  are secured to the arms  $m$ , and are



supported thereby. The rods  $x^2$  are supported at their inner ends in other braces,  $n'$ , also secured to the cylinder E and projecting inwardly. (See Fig. 1.) The outer ends of these rods are secured to arms  $m$ . The arms  $m m'$  are set radially, quartering with each other, (see Fig. 3,) on a hub,  $m^2$ , on the pipe  $o'$ , and are bolted securely to said hub at their inner ends. Their outer ends, to which the rods  $x'$   $x^2$  are secured, are removable, being fastened by screw-bolts at  $r$  to the arm proper, and so may be loosened and removed with the rods  $x'$  or  $x^2$ , to which they are attached, when it is desired to remove either of the inner sieves.

Hoops  $a^3$ , of an angle-iron shape in cross-section, are attached to the rods  $x x' x^2$  by passing the rods through holes in the projecting flanges of the hoops, and to the inside of these hoops the sieve is secured. As will be obvious, the sieves might be supported on the rods  $x x' x^2$  in many other ways. The flanged or angle-iron hoops  $a^3$  are, however, a simple and convenient contrivance for the purpose. The braces  $t t$ , fast at one end to the steam-cylinder D and at the other to the hub  $m^2$ , serve to stiffen and strengthen the whole construction, but form no essential part of the device. The braces K, secured at their inner ends to the steam-cylinder D and at their outer to cylinder E, are used, as commonly in drying apparatus of this kind, for holding the steam-cylinder securely in position inside the drier-cylinder. A coupling,  $o^3$ , of common construction, is provided where the pipe  $o'$  joins the pipe  $o$ , to enable the pipe  $o'$  to revolve with the cylinder, while the other part  $o$  is stationary. In the drawings, the spout A of the hopper B does not discharge directly onto the coarse sieve, but onto a band or short cylinder,  $i$ , Fig. 1, of tin or sheet metal, which forms a prolongation of the coarse sieve toward the hopper and insures the full discharge of the contents of the hopper onto the coarse sieve.

By this apparatus four grades of sugar are obtained, the finer going through onto the cylinder E outside of the finest sieve, and the three coarser grades remaining in their respective sieves until they work off their lower ends, and are discharged into a spout or chute

arranged to receive them, as indicated by the arrows, Fig. 1.

In applying my apparatus to other forms of drier or granulator it is necessary only to make slight mechanical changes—such as adapting the hopper B to ride on the comparatively small pipe or shaft  $m^4$ , instead of on the steam-cylinder D—it being only necessary in this case to lessen the size of the yoke  $a'$ , as shown, Figs. 4 and 5.

I do not desire to limit my invention to the use of my apparatus with a granulator or drier or for separating sugars only, as, obviously, it may be used without the drier and for separating other granular substances.

What I claim is—

1. A sifting apparatus consisting of two or more rotating drums of different mesh placed within each other and having the discharging ends lower than the receiving ends, substantially as described and shown.

2. The combination, in a sifting apparatus, of two or more concentrically-placed rotating drums of different mesh, with a stationary hopper mounted on the axis of rotation of the drums, substantially as set forth.

3. The combination, with the granulator-cylinder E, of two or more rotating drums placed one within the other and within the lower end of the cylinder, the supports for said drums being secured at their inner ends to braces on the cylinder, and at their outer or lower ends to arms radiating from a hub centered on the axis of rotation of the cylinder E, substantially as set forth.

4. The combination, with the rotating granulator-cylinder E, of the concentrically set drums secured within the lower or discharge end thereof, the stationary hopper B, suspended on the axis of rotation of said cylinder and within the same, and the flange S, secured to and projecting within the cylinder, whereby the sugar is retained at the lower end of the drying portion of the cylinder, and is thereby carried up and dropped into the hopper, substantially as set forth.

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Witnesses:

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