No. 725,642. PATENTED APR. 14, 1903.

H. W. ASH.

APPARATUS FOR GRADING MINERALS.

APPLICATION FILED SEPT. 2, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

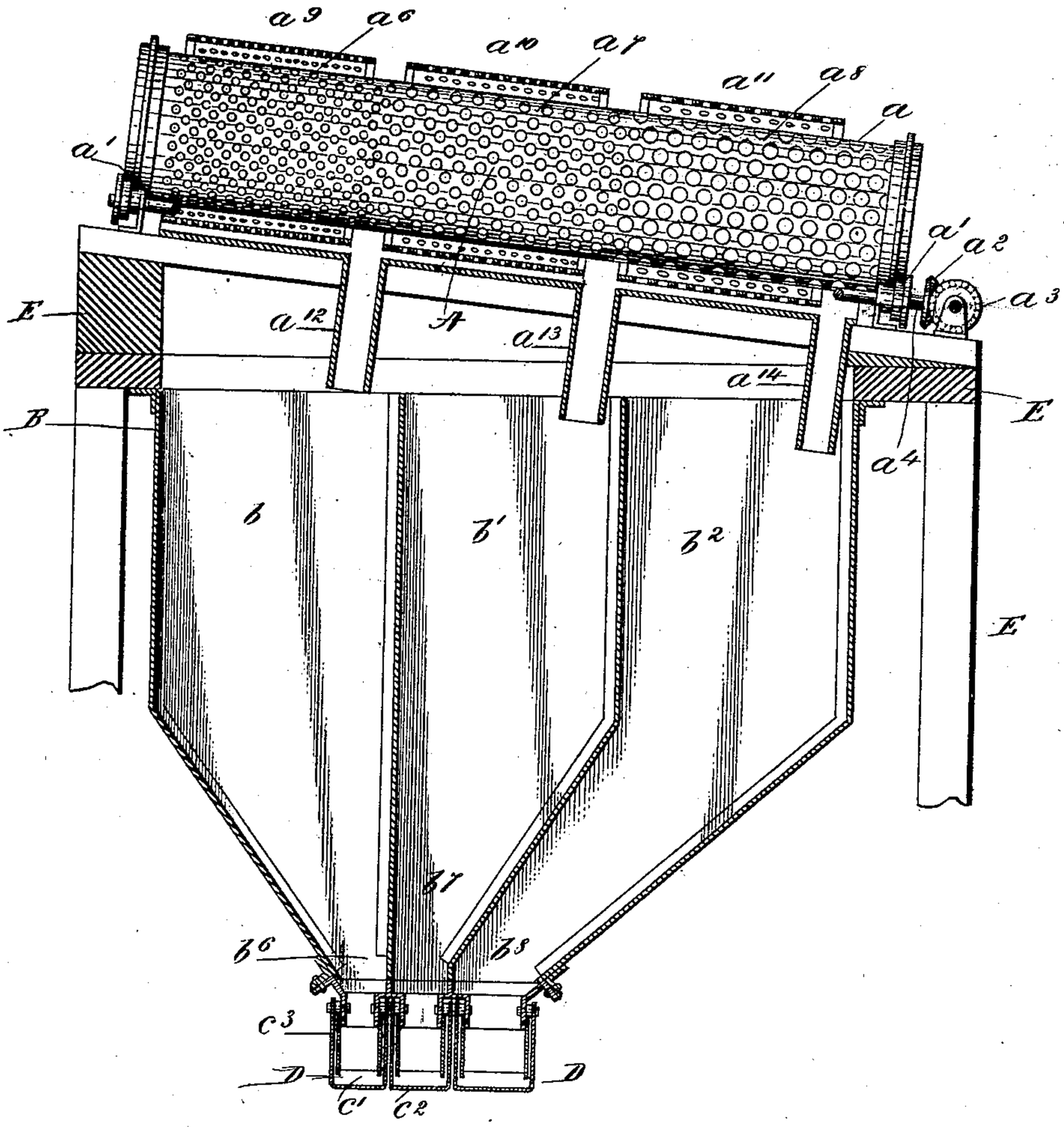

Fig. 1.

WITNESSES=
M. D. Newman
L. E. Q. Hayes

INVENTOR=
Horace W. Ash

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 725,642. PATENTED APR. 14, 1903.

H. W. ASH.

APPARATUS FOR GRADING MINERALS.

APPLICATION FILED SEPT. 2, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

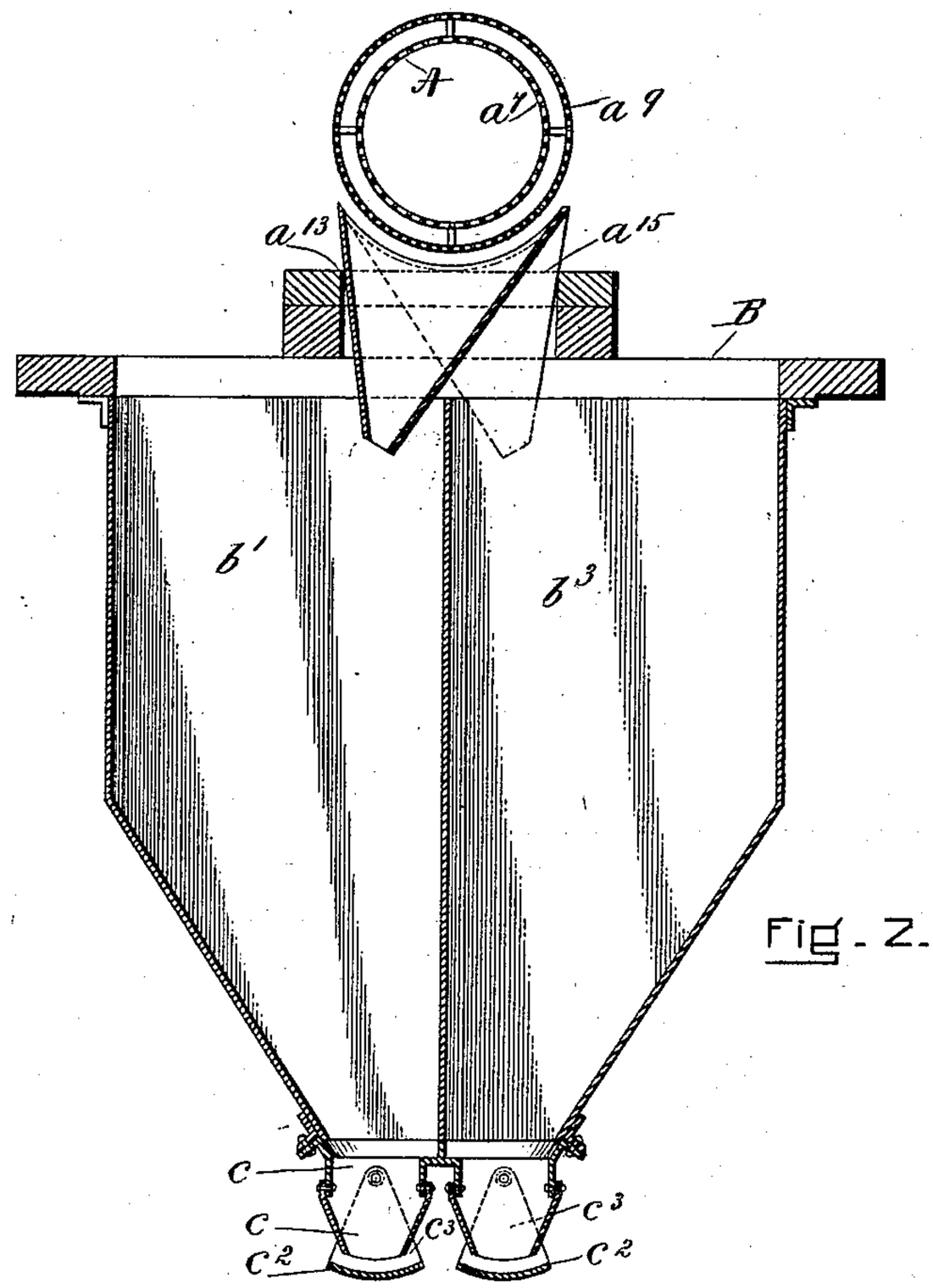

Fig. 2.

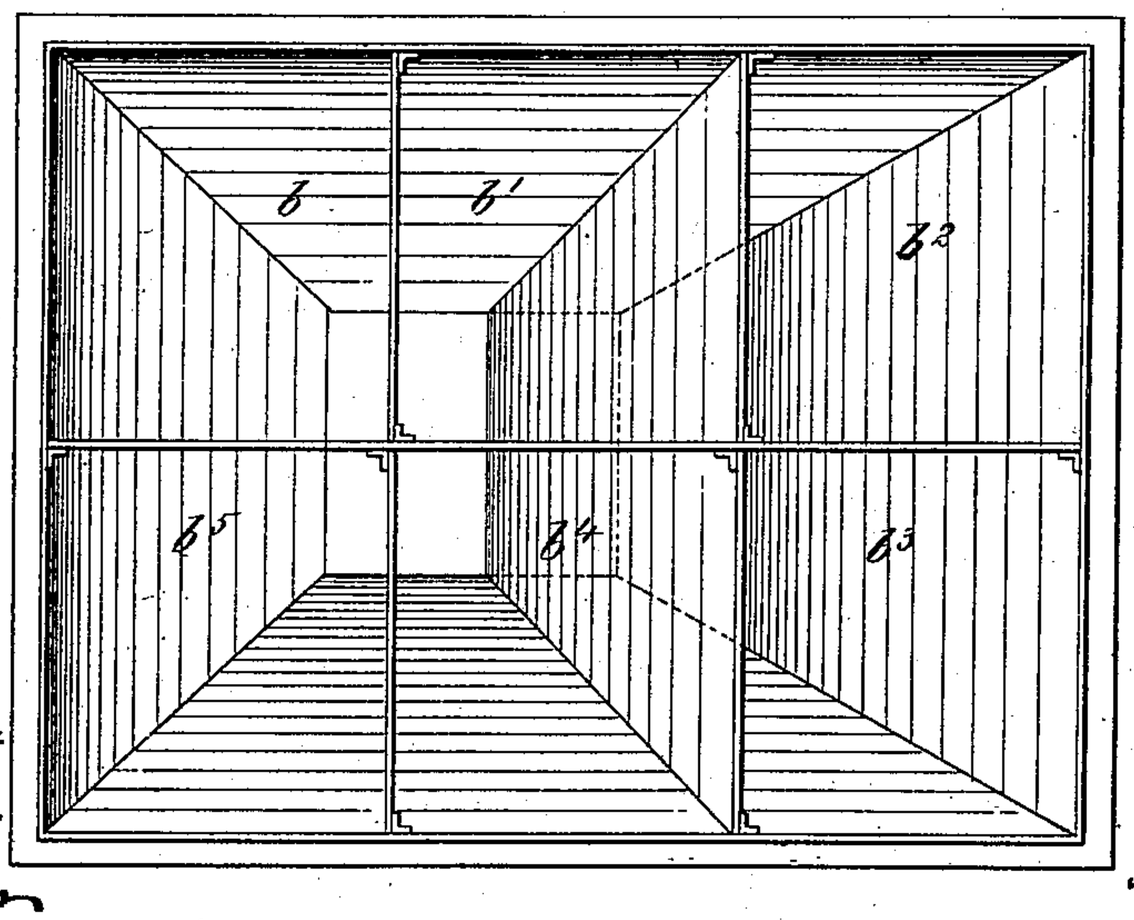

Fig. 3.

WITNESSES:
M. D. Newman.
L. E. R. Hayes

INVENTOR:
Horace W. Ash

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HORACE W. ASH, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO WARREN BROTHERS COMPANY, OF CHARLESTON, WEST VIRGINIA, AND BOSTON, MASSACHUSETTS, A CORPORATION OF WEST VIRGINIA.

APPARATUS FOR GRADING MINERALS.

SPECIFICATION forming part of Letters Patent No. 725,642, dated April 14, 1903.

Application filed September 2, 1902. Serial No. 121,913. (No model.)

To all whom it may concern:

Be it known that I, HORACE W. ASH, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Grading Minerals, more especially adapted for grading the mineral ingredients of bituminous-macadam and other pavements, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

In making what are known as "bituminous-macadam" pavements it is very desirable that the mineral ingredients shall be graded and shall be so separated that they may afterward be mixed in any desired proportions with whatever bituminous composition is to form the binder or cement of the pavement, and this for its economical use requires that the various grades of mineral ingredients after being separated shall be retained in suitable bins, from which they may be allowed to fall by gravity into a suitable measuring-box, from which they may be discharged into a mixer. It is also desirable that the outlets from these various bins shall all be so arranged with relation to each other that the mineral ingredients from each will fall side by side and within a small area. For this purpose I have devised the apparatus shown in the drawings, which comprises a suitable screening mechanism and a series of bins located beneath the screening mechanism, which bins are so suspended that their mouths are considerably above the level of the receptacle into which the mineral ingredients are to be drawn, the mouths to the bins being somewhat reduced in size from the cross-sectional area of the main portion of the bins, located close together, and provided with suitable gates whereby their contents may be retained.

My invention will be understood by reference to the drawings, in which—

Figure 1 is a longitudinal section of a grading apparatus embodying my invention in its preferred form. Fig. 2 is a view of the same parts in vertical cross-section, and Fig. 3 is a view of the bins in plan.

Referring to the drawings, A is a screen adapted to separate the mineral ingredients automatically into grades and to deliver the grades into the grading-bins B, located below it. This screen A, as shown, comprises a shell a, which is somewhat inclined from a horizontal position and is supported on suitable bearings a' and is slowly rotated by means of the beveled gears a^2 a^3 and the shaft a^4, having pinions a^5 meshing with the gears on the shell, power being applied thereto by any suitable means. This shell is perforated throughout; but the perforations are arranged in the divisions a^6, a^7, and a^8, the smaller perforations being at the upper end, the intermediate perforations in the center, and the larger perforations at the lower end. The shell is surrounded by three jackets a^9, a^{10}, and a^{11}, which are attached to it to be rotated therewith and which surround, respectively, the perforated sections a^6, a^7, and a^8. Each jacket is perforated, the jacket a^9 having smaller perforations than the section of the shell it surrounds, and the same being true of the jackets a^{10} and a^{11}. At the end of each jacket there is a chute which delivers the ingredients which pass from the shell upon the jackets, but which do not pass through the jackets, into individual bins for receiving and holding them. Thus the chute a^{12} receives such ingredients from the jacket a^9 and delivers them to the bin b. The chute a^{13} receives such ingredients from the jacket a^{11} and delivers them to the bin b'. The chute a^{14} receives such ingredients from the jacket a^{11} and delivers them to the bin b^2. Under each jacket there is also a chute which receives the ingredients which pass through the perforations thereof and delivers them to their appropriate bins. Thus the jacket a^9 has a chute a^{15}, which conveys such ingredients to the bin b^3. The jackets a^{10} and a^{11} have corresponding chutes which deliver the ingredients passing through them, respectively, to the bins b^4 and b^5. There is thus obtained and held for use in the various bins mineral ingredients of six grades, and so long

as the screen is kept fed with a supply of mineral ingredients these ingredients are being constantly graded and delivered automatically to these bins, each bin receiving ingredients of one grade.

As shown, the bins are arranged in lines side by side and are provided with direct outlets at their lower ends, which are brought together, so as to be included in a space of small compass. This is a convenient arrangement; but it may be varied somewhat, its object being to bring the mouths of the bins together, so that their total area will approximate the area of the receptacle into which they are to discharge or to minimize the movement of that receptacle when the discharge from the various bins is to be expected. As shown, the bin b has the direct outlet b^6, the bin b' the outlet b^7, and the bin b^2 the outlet b^8, and the other bins b^3, b^4, and b^5 have corresponding outlets. Each bin has at its outlet a suspended nozzle c, through which its contents flow, and which has an outlet c', which is slightly convexed and which is closed by a valve c^2, having the curved closing-plate, carried by hangers c^3, pivoted on each side of the nozzle. Each valve is adapted to be opened and closed by hand. The nozzles are so closely arranged as to deliver the contents to the bins within a relatively small area, so that the bins may be supported to deliver any grade required to a comparatively small receptacle placed below them, which may be located there either permanently or temporarily.

The bins B preferably support the framework upon which the screen A is mounted, and the bins themselves are preferably made of sheet-iron and are supported by the framework, comprising suitable inclined uprights E and cross-bars, if necessary. This framework may also support the cross-bars, upon which the receiver and other mechanism suitable for use in preparing pavement of the kind referred to may be carried.

In the use of this mechanism the mineral ingredients may be fed to the screen automatically or by hand. When received in the screen, they are automatically separated into the different grades and delivered by the screens into the six receiving-bins, where they are held in such position that as much of either grade as may be desired for the purpose of mixing any composition required may be delivered automatically to the suitable receiver, which may be merely a combiner or a weigher or a carrier of any type, the valves being opened by hand for this purpose.

I have shown the screen capable of separating the ingredients into six grades and have shown six bins located below the screen; but it is evident that screens of this character may be made to separate such ingredients as are referred to into any other number of grades desired, corresponding bins being provided and the openings at the bottom of the bins being reduced in cross-area of the bins and brought together, so that the combined area of these openings is small compared to the total area in cross-section of all the bins in the apparatus.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. An improved apparatus for preparing mineral ingredients of pavements consisting of a rotary screen comprising a cylinder made up of sections each section having perforations of a given size, the perforations in one section differing from those in each of the other sections, each section being surrounded by a jacket, each jacket being perforated and having perforations of a size differing from the perforations in every other jacket and the perforations of said cylinder, means for delivering the ingredients which pass each set of perforations into a separate bin, each bin having an outlet at its bottom and a separate gate for each outlet.

2. An improved apparatus for preparing mineral ingredients of pavements consisting of a rotary screen comprising a cylinder made up of sections each section having perforations of a given size, the perforations in one section differing from those in each of the other sections, each section being surrounded by a jacket, each jacket being perforated and having perforations of a size differing from the perforations in every other jacket and the perforations of said cylinder, means for delivering the ingredients which pass each set of perforations into a separate bin, each bin having an outlet at its bottom and a separate gate for each outlet, the outlets of said bins being brought together whereby the several bins may feed into a single receptacle of small horizontal area.

3. The combination, in an apparatus of the character specified, of a rotary grading-screen having the perforated sections a^6, a^7, and a^8, the perforated jackets a^9, a^{10} and a^{11}, mounted thereon, and each surrounding one of the perforated sections of said cylinder, the perforations of each screen-section and of each jacket differing in size from the perforations of every other screen-section and jacket and all being arranged with relation to each other as described, and an independent chute for each screen-section and jacket and an independent bin for each, as set forth.

HORACE W. ASH.

Witnesses:
M. D. NEWMAN,
J. E. R. HAYES.