

(No Model.)

2 Sheets—Sheet 1.

W. E. WILD.

MACHINE FOR SEPARATING, SORTING, AND GRADING GRAIN.

No. 299,446.

Patented May 27, 1884.

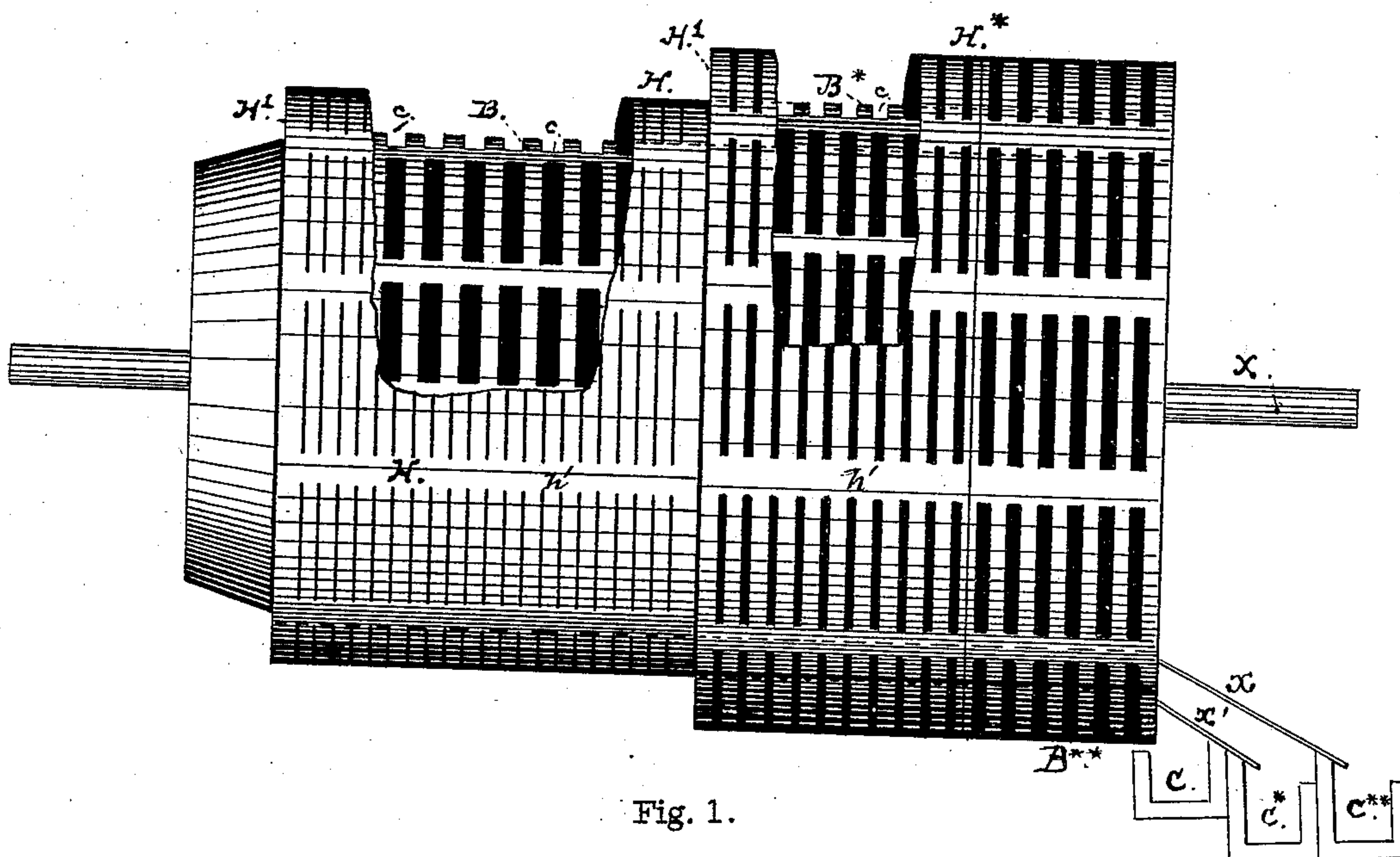
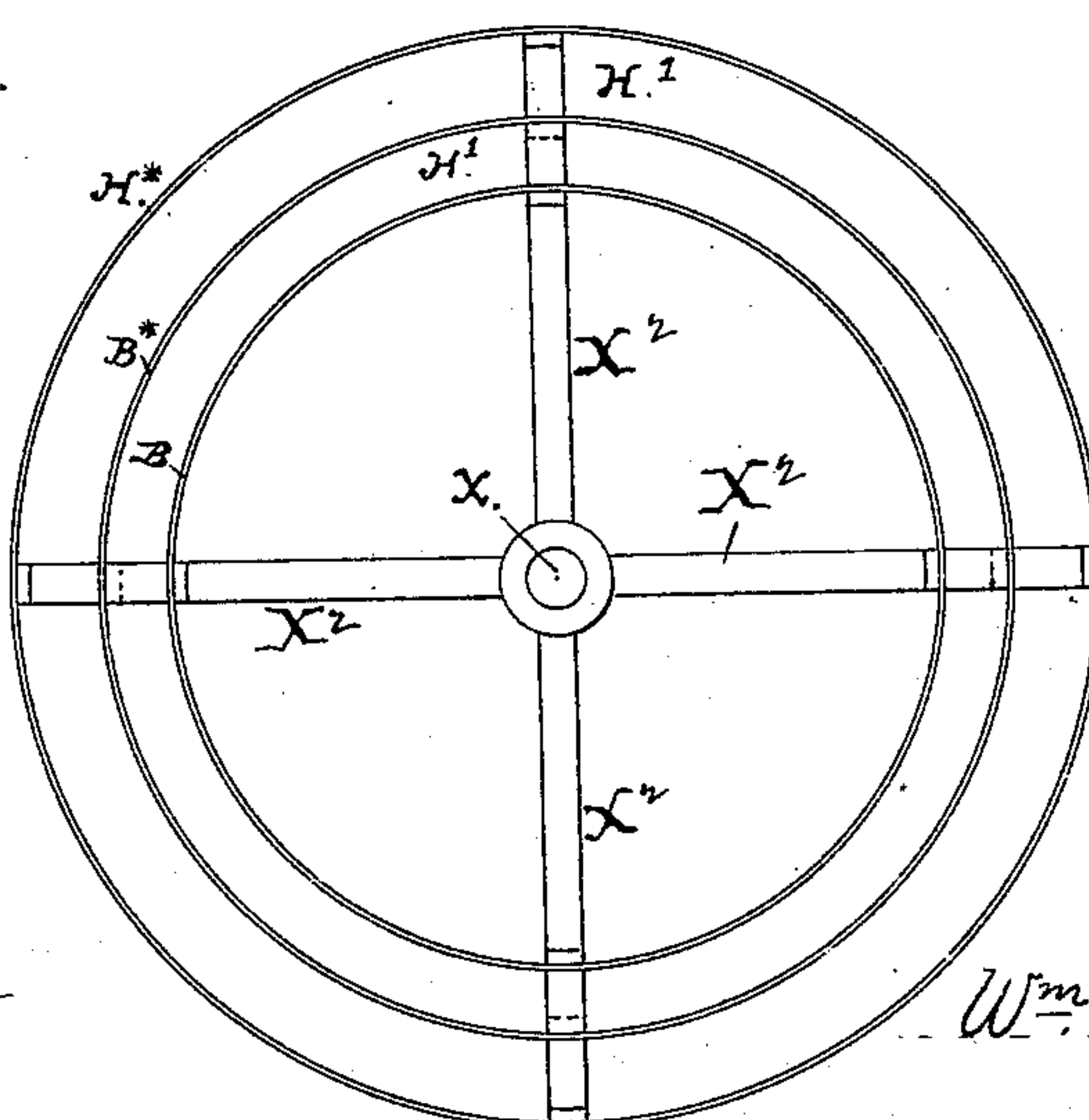


Fig. 1.



WITNESS:

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INVENTOR.

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Fig. 2.

*Edw. C. Shum* Attorney.,

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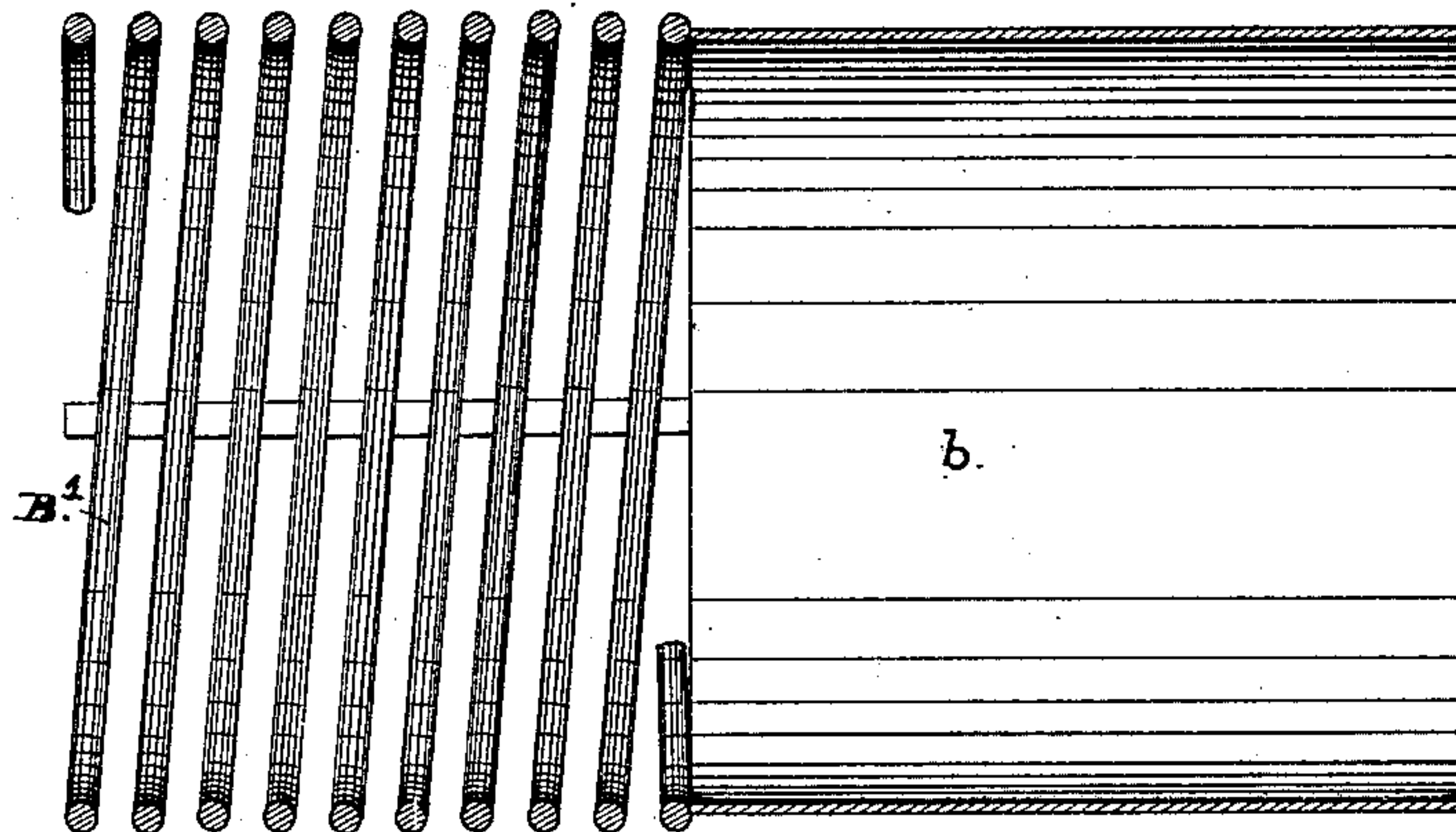


Fig. 3.

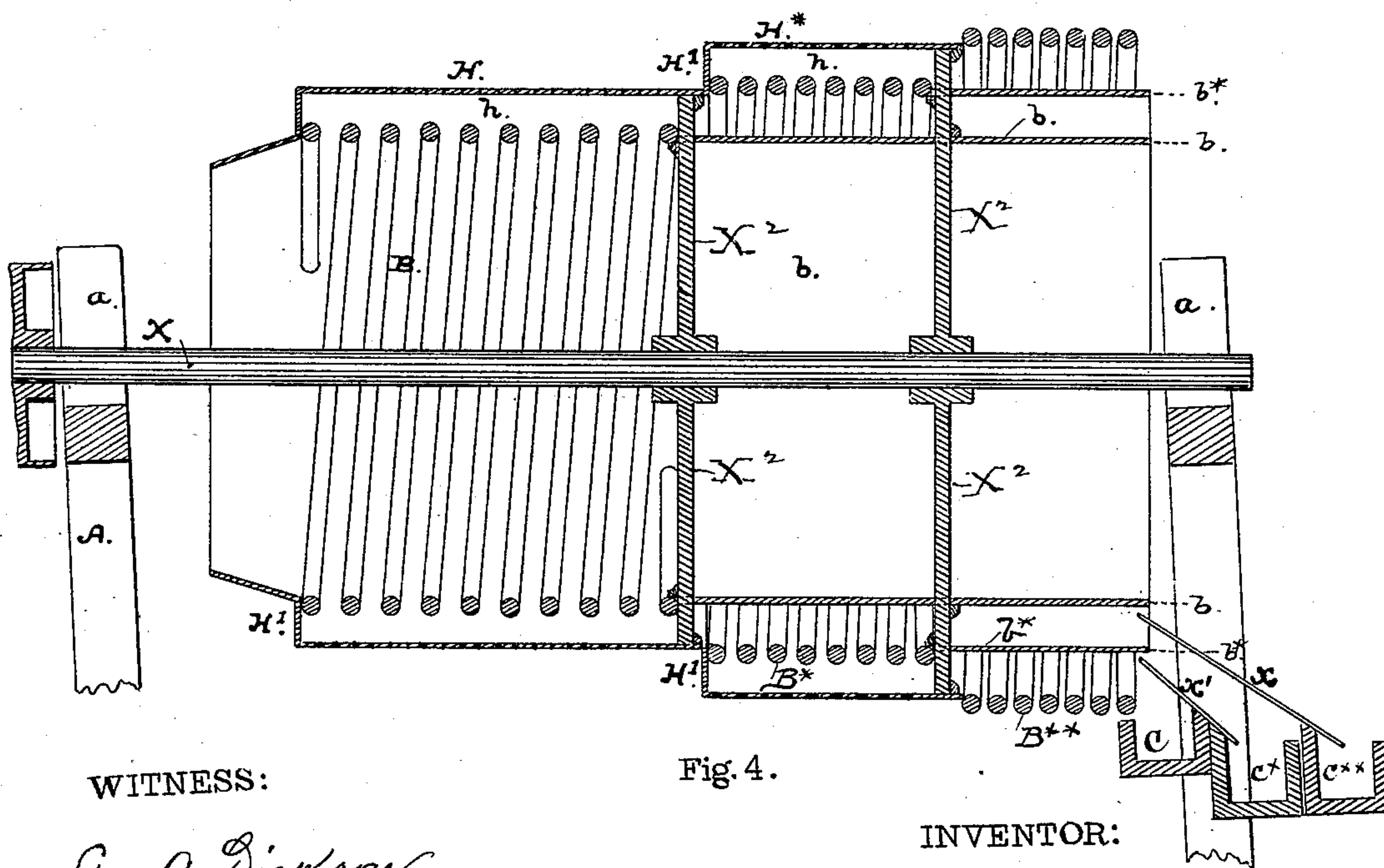


Fig. 4.

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# UNITED STATES PATENT OFFICE.

WILLIAM E. WILD, OF LOVELAND, COLORADO.

MACHINE FOR SEPARATING, SORTING, AND GRADING GRAIN.

SPECIFICATION forming part of Letters Patent No. 299,446, dated May 27, 1884.

Application filed August 17, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. WILD, a citizen of the United States, residing at Loveland, Laramie county, State of Colorado, have  
5 invented certain new and useful Improvements in Machines for Separating, Sorting, and Grading Grain, of which the following is a specification.

My invention relates to a certain novel construction of cylindrical screens for cleaning  
10 and separating grain and such substances from foreign seeds and bodies and for extracting dirt and foul matters therefrom, so constructed of different sizes of screen-cylinders that the  
15 cleaned and separated substance is discharged from it in portions of equal grade as to size of particles.

The following description fully explains the manner in which I construct and operate my  
20 said invention, reference being had, by figures and letters, to the accompanying drawings, in which—

Figure 1 is a side view of a separating-barrel, partly broken away, formed of a series of  
25 cylindrical screens, set one within the other and fixed upon a shaft or axle having rotary motion. Fig. 2 is an end view from its discharge end. Fig. 3 is a longitudinal section through an imperforate cylinder and a screen-  
30 surface formed from a spirally-wound rod or wire. Fig. 4 is a longitudinal section through a barrel or cylindrical separator composed of concentric screening-surfaces that are formed after the manner shown in Fig. 3.

35 A represents a suitable frame-work having boxes *a a* to support the central shaft or axle of a cylindrical separating-barrel, B, and giving support to discharge-spouts for delivering the grain or other substance to be treated from  
40 the cylinder-screens. The shaft X is set out of the horizontal in order to give inclination to the screening-surface, so that the substance thereon shall have progression as well as agitation as the cylinder rotates. The same result may be obtained by giving the screens a  
45 conical instead of a cylindrical shape. The screen is a cylinder having a perforated portion, B, and an imperforate portion, *b*, which is a continuation of the screening-surface B.  
50 The perforated part B constitutes the screen proper, while the imperforate portion *b* forms

a receiving and conducting surface for all that portion of matter retained by and incapable of passing through the screens.

I may employ two constructions of screening-  
55 cylinders. In one construction the whole cylinder is formed by bending up a length of sheet metal having a portion of its surface (for the whole width and for about one-half its length) slotted with long narrow slots *c c*, running transversely or at right angles to the  
60 length, and in close order, and having the remaining half or portion without slots or openings of any kind. In the other construction the cylinder is formed by bending up a length  
65 of wire or rod into a spiral, with regular spaces or interstices between the coils, and then securing this spiral cylinder B to the end of an imperforate cylinder, *b*. If the screen as thus  
70 constructed needs stiffening or staying, narrow bars or strips may be laid longitudinally over the spirals, and at intervals apart around the circumference, to bind the coils together and  
75 secure regularity of space between them. In both constructions the cylinder produced has a screening-surface and a close non-perforated continuation thereof, forming a conducting surface. In the latter construction, however, the  
80 openings or spaces have a spiral direction, and as the cylinder is rotated they tend to progress or move the substance being treated therein longitudinally over the surface. Several of such screens B, regularly graduated as  
85 to size of apertures or perforations, are combined together to produce a complete machine, by which many different grades or qualities of separated and sorted substance can be obtained, as seen in Figs. 1 and 4. The cylinders are mounted one ahead of the other in a  
90 horizontal or slightly-inclined line, and they increase in fineness of slit or perforation and in diameter from the feed to the discharge end of the machine. The imperforate conducting-surface extends from the end of each perforate screen to the discharge end of the machine, and  
95 conveys away all the matter which will not pass through said screen or perforate surface. All the particles which shall have passed through the first perforate surface are conducted on to the next perforate surface, and  
100 so on to the last.

To receive the screened matter from one



cylinder and to conduct and deliver it upon the screen of the next cylinder, I place around the screen an outer casing, H or H\*, constructed of a cylinder somewhat larger in diameter than the part of the cylinder inclosed, so as to produce an annular chamber, as *h*, as a receptacle to catch the particles passing the screen. The casing H is perforated or slitted, as seen at *h'*, Fig. 1, to discharge and throw off such foul and refuse matter as dust, small seeds, and foreign particles that have passed through the screen.

To produce a complete and effective machine, I arrange and combine several screen-cylinders and casings together upon a central shaft or axle, and concentrically one around the other, with sufficient spaces *h* *h* between them, the coarsest screen being at the feed end of the machine, into which the matter to be treated is first introduced, the succeeding ones decreasing in size of apertures as they increase in diameter. The close surface *b* of this first cylinder extends out to the extreme end of the barrel, where a receiving-spout, C\*, is fixed in the frame A in position to take the matter discharging from the end of this cylindrical part *b*, and around the screen portion of the cylinder the casing H forms an annular chamber, *h*, of a length equal to the length of the screen-surface. In line with and forming, practically, an exterior of this casing is fixed a second cylinder, B\*, having likewise a screening portion and a close conducting-surface, *b*\*, extending therefrom to the end of the barrel. A casing, H\*, surrounding the screen of this second cylinder, forms the annular chamber *h*, and may or may not have the screen end of a third cylinder, B\*\*, placed against and in line with it, according to the size of machine required. The annular opening at the end between one casing and the next is closed by a flange or head, H'. Each cylinder thus extends out at the lower end to the extreme end of the barrel, and its close conducting-surface delivers into a spout, C or C\*, &c., over the spouts *x* or *x*\*, or directly, as seen in Fig. 4, at the end, whatever matter passing over the screen is too large to be discharged into the chamber *h*, formed by the surrounding casing, while from each screen the substances passing through are directed into the next lowest and next finest screen-cylinder by this casing. Thus, as seen in Fig. 4, the casing H, which surrounds the screen B, delivers the material which has passed through said screen into the screen B\*, and the casing H\* conveys the matter which passes through the screen B\* into the screen B\*\*, the arms X<sup>2</sup> X<sup>2</sup> serving merely to support the screens on the shaft X, and do not intercept the passage of the grain.

The openings *h'* in the series of casings are graduated in size, but are considerably finer than the screens, so that only fine particles of dust and foreign matter are permitted to pass through. They are graduated in reverse order to the screens, also, but at no point shall

the casing-apertures be larger than the screen-openings next above it, nor those of the screen around which such casing is placed. This alternation of coarser screen and finer casing and finer screen and coarser casing is made for the reason that much valuable material of large size will pass through the openings in the larger screen, and if allowed to pass out of its casing would be wasted; but as the screening goes on the valuable material is more and more completely removed from the mass of material which is moving toward the discharge end of the machine, and the matter thrown out upon the casing will be to a greater extent waste; hence the necessity for larger openings in the casing to let this waste through. Such combination and construction of parts produce a machine that is more compact and requires less room and simpler driving mechanism than if the several cylinders were mounted on separate shafts in order, one below the other, to act in succession, as in that arrangement each cylinder would have a separate conducting trough or spout to lead the matter into it and a discharge spout or receptacle as well.

In the operation of this machine, having these screens and casings arranged concentrically, as described above, all the matter to be treated is first introduced into the first or coarsest cylinder, and by the combined action of the inclination of its surface and the rotation imparted to it the cylinder will separate and admit into the chamber all those particles or bodies capable of passing through the screen, but the coarsest matter incapable of passing through will descend over the plain surface of the cylinder and be discharged from the lower end into the spout provided to carry it off. In like manner the screened portion of matter caught in the chamber *h* will pass down into the next screen-cylinder, and in passing over the screening-surface therein it will be divided into two bodies, of which that composed of particles too large to pass the screen will be discharged over the close cylindrical surface, and the other, consisting of the matter admitted through the screen, will drop into the annular chamber formed by the surrounding casing, there to be directed into the third cylinder. If a quantity of wheat be introduced into the first cylinder to be cleaned and sorted, there will be discharged from the said cylinder all such large particles as stones, hard lumps of dirt, grains of corn, and such foreign matter, and from the other cylinders different grades or sizes of wheat, according to the character of the screen. The outer casings in their turn will separate and throw off such fine matter as dust, seeds, oats, and other foreign matter.

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

1. The combination of the perforate cylinders B B\*, having the imperforate extensions



5 *b b\**, with the casings *H H\**, arranged and combined so that the matter retained in each perforate cylinder shall be passed directly out of the machine over the imperforate extensions, and the matter passed through each perforate cylinder shall be conveyed by the casing surrounding the same to the front of the next cylinder, substantially as described.

2. The combination, with a series of screen-

cylinders graduated in mesh or size of opening, of a series of casings surrounding said cylinders, perforated in reverse order to the screens, the coarsest-meshed screen having the finest-meshed casing, as set forth.

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Witnesses:

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G. W. EMERSON.