No. 772,331. PATENTED OCT. 18, 1904.

W. H. BAXTER.

ROTARY SCREEN.

APPLICATION FILED MAR. 31, 1902.

NO MODEL.

Fig. 3.

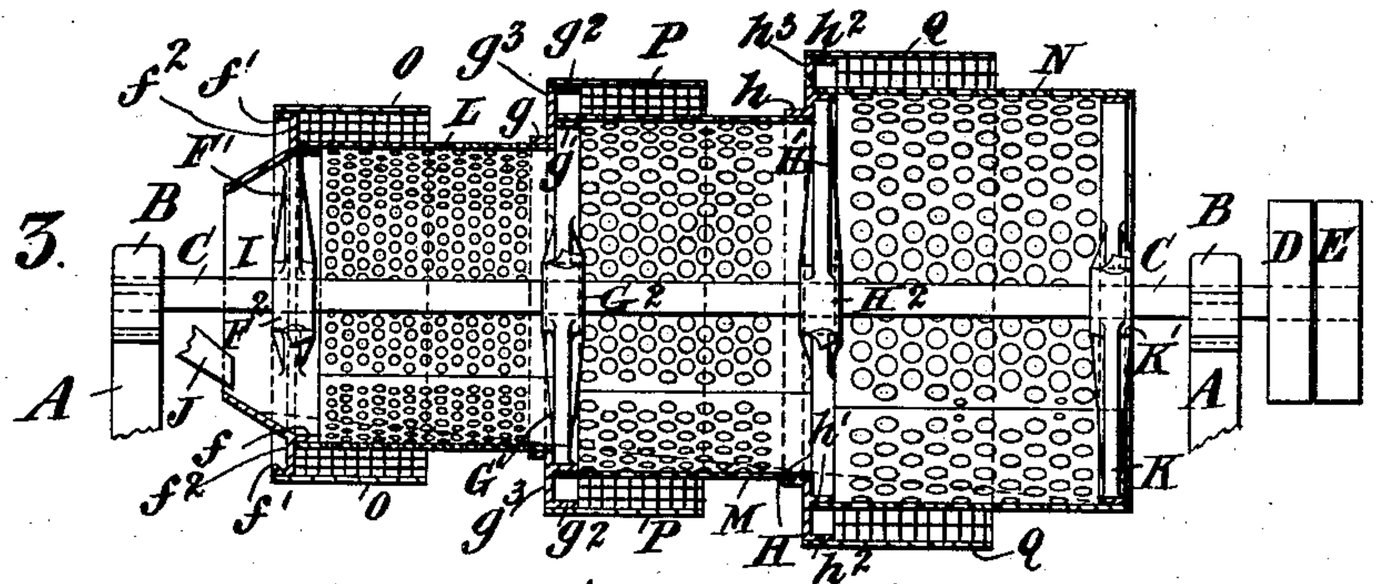


Fig. 1.

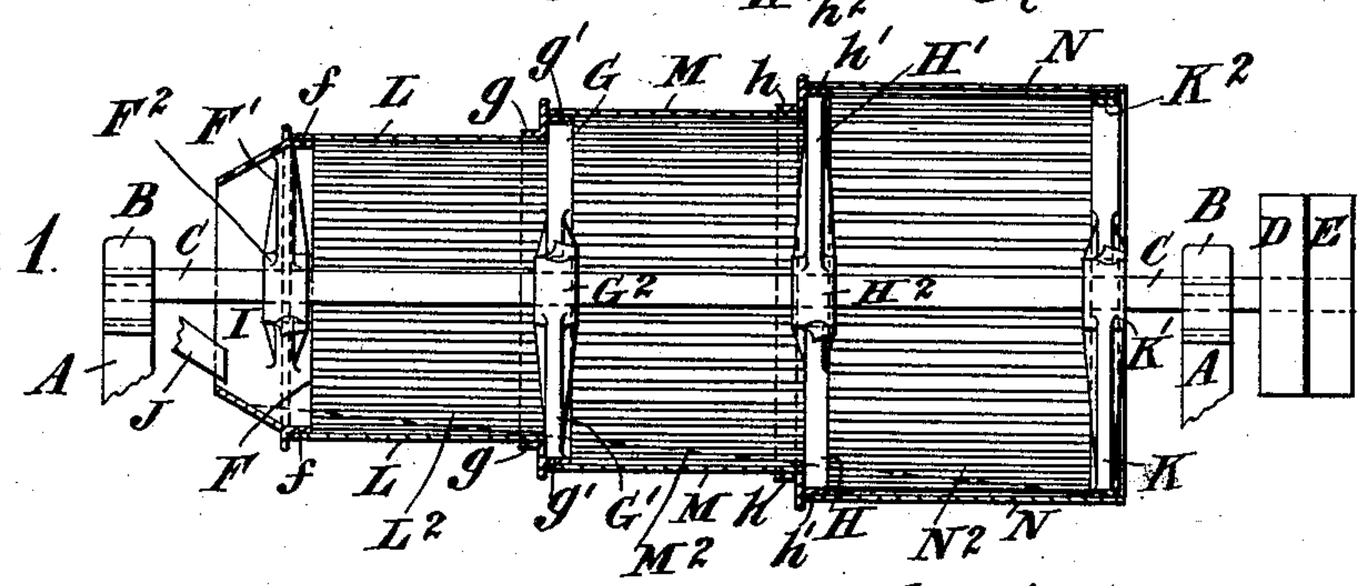


Fig. 4.

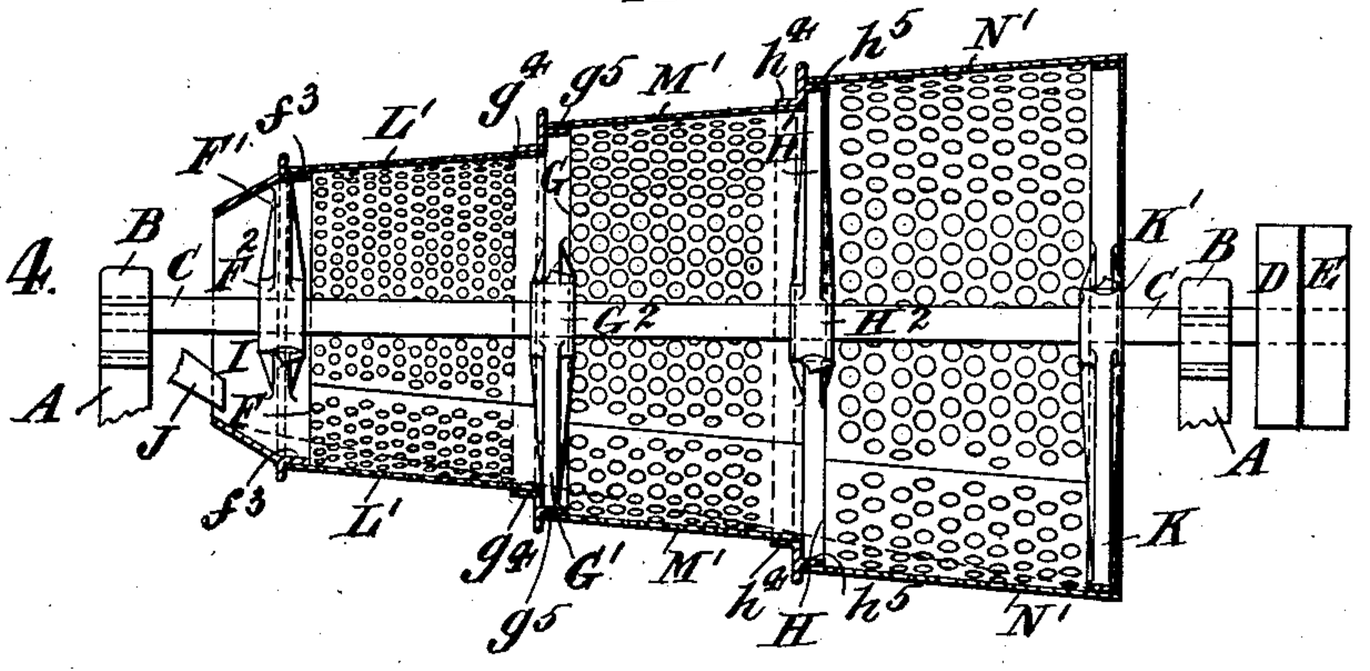
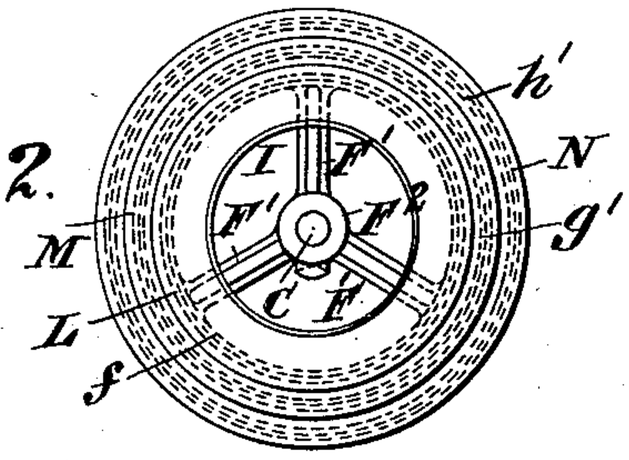


Fig. 2.



Witnesses:-
William Sadler
Annie Park.

Inventor.
William Henry Baxter
by
H. Fairburn-Hart
Attorney.

No. 772,331. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY BAXTER, OF HARROGATE, ENGLAND.

ROTARY SCREEN.

SPECIFICATION forming part of Letters Patent No. 772,331, dated October 18, 1904.

Application filed March 31, 1902. Serial No. 100,756. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY BAXTER, a subject of the King of Great Britain and Ireland, residing at Harrogate, in the county of York, England, (whose post-office address is Knapping Mount, Walker Road, Harrogate, county of York, England,) have invented new and useful Improvements in Rotary Screens, of which the following is a specification.

This invention relates to improvements in rotary screens, such as are used for screening stone, ore, and like materials.

Hitherto screens that have been used for the above-named purposes have either been made parallel and mounted in bearings on the incline or the screen has been made to taper longitudinally in one continuous straight line, or special means, such as propelling-blades or an Archimedean screw, have been provided for causing the material to travel longitudinally through a horizontally-arranged parallel screen.

Now the object of the present invention is to construct a stepped screen, formed of a series or number of cylindrical or other shaped parallel or tapering or other portions or sections, each portion or section being of a different diameter to the preceding one, but to be connected to and to communicate with each other and to be mounted upon a common shaft carried in bearings in a horizontal and level position. In this arrangement of screen by making, say, the inlet end of the screen of the smallest diameter and the outlet end the largest, or vice versa, a series of steps can readily be formed in the longitudinal direction of the machine. By this means the material is enabled in, say, each parallel portion or section to form its own incline and permits of the larger material first to pass or readily roll over the incline formed of the smaller material and at the same time permits of the latter being more thoroughly screened, while each step forms a barrier for preventing the material traveling backward and in the wrong direction. I attain this object by machinery illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a screen constructed according to this invention, with parallel cylindrical sections; Fig. 2, an end elevation of the same; Fig. 3, a sectional elevation of a screen constructed in a similar manner to that shown at Fig. 1, but provided with a second set of screening-surfaces; Fig. 4, a sectional elevation of a screen drawn to a smaller scale, but with tapering sections.

The screen illustrated at Figs. 1 and 2 is first described. A is the framework, B the bearings (in the form of pedestals mounted upon the said framework) for the shaft C, common to all the sections of the screen. The shaft C is mounted in a horizontal position, so as to be in this instance as near level as possible. D and E are respectively fast and loose pulleys, to which motion is imparted through belting (not shown in the drawings) from any suitable source of power, or any other method of imparting motion to the shaft C may be employed.

All the above parts are of ordinary and well-known construction, and therefore do not require further description.

On the shaft C are mounted and fixed at suitable distances apart a number of end pieces, three of which are shown in the drawings and marked F, G, and H, and which vary in diameter to form the steps of the screen.

The end pieces F, G, and H, which also vary in number with the number of steps required in the length of the screen, are constructed as follows: At Fig. 1 one horizontal flange f is shown on end piece F, and two horizontal flanges $g\,g'$ and $h\,h'$ are shown, respectively, on end pieces G H. The said flanges are concentric with the axis of the screen and are provided for each section and connected together by vertical or angular rings or plates f^2, g^3, and h^3, so that each pair of flanges when two are used, as on end pieces G H, project in opposite directions and are at the required distances apart. The vertical rings are made to fill up the space between the different diameters of the sections, thereby forming a number of steps in its length. The plate f^2 of end piece F is made to form a part of or may be attached to the conical receiver I, which is provided thereon. The arms F′ G′ H′ are respectively attached to or form part of the

end pieces F G H, as shown, and their inner ends are cast (or otherwise fixed) to a boss F^2 G^2 H^2, by which the screen is mounted upon its supporting-shaft.

J is a chute which is in communication with the conical receiver I.

The arms K, at the outlet end of the screen, are of ordinary construction and connected to a boss K′, by which they are mounted upon the shaft C.

The above-mentioned flanges *f g g′ h h′* is or are formed on or fixed to the end pieces F G H, so as to form a part thereof, and the circular horizontally-projecting flanges *g g′ h h′* are arranged to project in opposite directions parallel with the axis of the shaft C. To each of said flanges is fixed by any suitable means, such as bolts, a parallel cylindrical portion or section, which forms the means by which the various portions of the screen are connected together and made to communicate with each other. The end pieces and parallel cylindrical portions and sections also form the steps in the screen—that is to say, as shown in the drawings, a parallel cylindrical portion or section L is fixed to the flanges *f* and *g* of the end pieces F and G, a second parallel cylindrical portion or section M—say of larger diameter—is fixed to the flanges *g′* and *h* of the end pieces G and H, and a third parallel cylindrical portion or section N is fixed to the flange *h′* of end piece H and to the arms K. The vertical plate portions f^2, g^3, and h^3 of the end pieces, respectively, are made to fill up the space between the peripheries of the said sections caused by their differing sizes at each step. The number of parallel cylindrical portions or sections may be increased or diminished as circumstances require. The parallel cylindrical portions or sections are made, say, of metal plates, perforated on their peripheries, as at Fig. 3, or the periphery of each section may be formed of a number of bars or rods of iron arranged longitudinally and parallel with each other and with the axis of the shaft C, or the periphery of each section may be formed of wirework or like material or a combination of two or more of the just-mentioned materials, and each succeeding portion or section is made to vary in diameter, not necessarily in the same proportion; but it is essential that they should increase in diameter as they approach the outlet end of the stepped screen. The perforations in the periphery of each of the said portions or sections also increase, though not necessarily so, in size as they approach the outlet end of the screen. The said portions or sections F and G are shown about the same length and shorter than the portion marked H, yet I would distinctly have it understood that each of the said portions or sections or each portion or section may be of a different length, as circumstances may require, and, if so required, may be made partly parallel and partly to taper. The end piece at the inlet end is also made to form a step, and the section or portion of the stepped screen attached thereto may, if so desired, be larger in proportion than the remaining portions or sections.

At Fig. 3 a screen similar in construction to that illustrated at Fig. 1 is provided with a second set of outer screening portions O P Q—that is to say, each portion of the stepped screen shown at Fig. 1 is surrounded with a second and outer screen marked, respectively, O P Q, of a shorter length, as shown, and of the same or a different mesh. When this is the case, flanges *f′ g² h²* will be provided on the end pieces F G H above the flanges *f g′ h′* and respectively connected to the end pieces by prolonging the vertical plate portions f^2 g^3 h^3 above the last-named flanges. The flanges *f′ g² h²* may be arranged to project on either side of the said vertical portions, so as to permit of the screens O P Q, which are secured thereto, projecting in either direction. The screening-surfaces O P Q are each closed at the end nearest the inlet end of the screen and they are each open at the opposite end. This permits of two gradings of the material being made by these screening-surfaces in addition to those of the main sections of the screen.

At Fig. 1 the inner screening-surfaces are shown composed of a number of bars or rods of iron L^2 M^2 N^2, arranged longitudinally and parallel with (and at a distance from) each other, as well as with the axis of the shaft C. The ends of bars N^2 are fixed to a ring K^2, attached to the arms K. The outer screens O P Q at Fig. 3 are shown formed of wirework.

At Fig. 4 the peripheries of the portions L′ M′ N′ are shown each to taper. In this case the flanges f^3 g^4 g^5 h^4 h^5 will also require to be made to taper to suit the said portions. The shaft C in this case is shown in a horizontal position, as at Fig. 1.

The action of the screen is as follows: On the material entering the screen through the chute it first passes through the first section of the screen and gradually forms an incline therein until it overflows into the second section and afterward into the third section, and so on to the end of the screen, whereby a continuous incline will be formed in the interior of the stepped screen from one end of the said screen to the other.

By forming the screen of cylindrical portions or sections, as described, increasing in size and uniting them together by end pieces, as described, a series of steps and also barriers to prevent the material receding are provided in the length of the screen, which enables the material to form its own incline in each portion thereof and the larger pieces to more readily gravitate to the exit end of the screen, while the smaller portions of the material will be more thoroughly screened

prior to reaching the outlet end thereof than by screens of ordinary construction. The rotation of the stepped screen aids in causing the material to travel through the screen.

It will be readily understood that, if so desired, a screen with one step at the end piece F and one long screening-surface L only could be employed. When this is the case, the long screening-surface L will require to be attached at one end to the said end piece F and at its opposite and outlet end to arms K; but the result would not be so satisfactory as when more than one step is employed; but in this latter arrangement the flange of the end piece will require to be placed in such a position that it will permit of there being room for sufficient storage of material to form an incline between the inlet and exit ends of the screen.

Having now particularly described the nature of the said invention and how the same may be carried into practice, what I claim as my invention, and desire to secure by Letters Patent, is—

The combination with two or more sections of a rotating screen of different diameters and fineness arranged upon a common shaft to permit of each section being in communication with the succeeding one, of end pieces for connecting end of a smaller and finer section with the end of the succeeding larger and coarser section, said end pieces being connected with the said shaft by arms and a boss, a conical receiver formed integrally with the end piece of the smaller and inlet end of the screen, pulleys mounted on the shaft for rotating the same, and a short cylindrical screening-surface arranged around and parallel with a portion of the length of each of the said sections, said short screening-surface being closed at one end and open at the other end, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HENRY BAXTER.

Witnesses:
THOMAS SMITH,
WILLIAM SADLER.