Feb. 15, 1927. 1,617,688

E. O'TOOLE

ROTARY SCREEN

Filed July 15, 1924 2 Sheets-Sheet 1

Fig. 1.

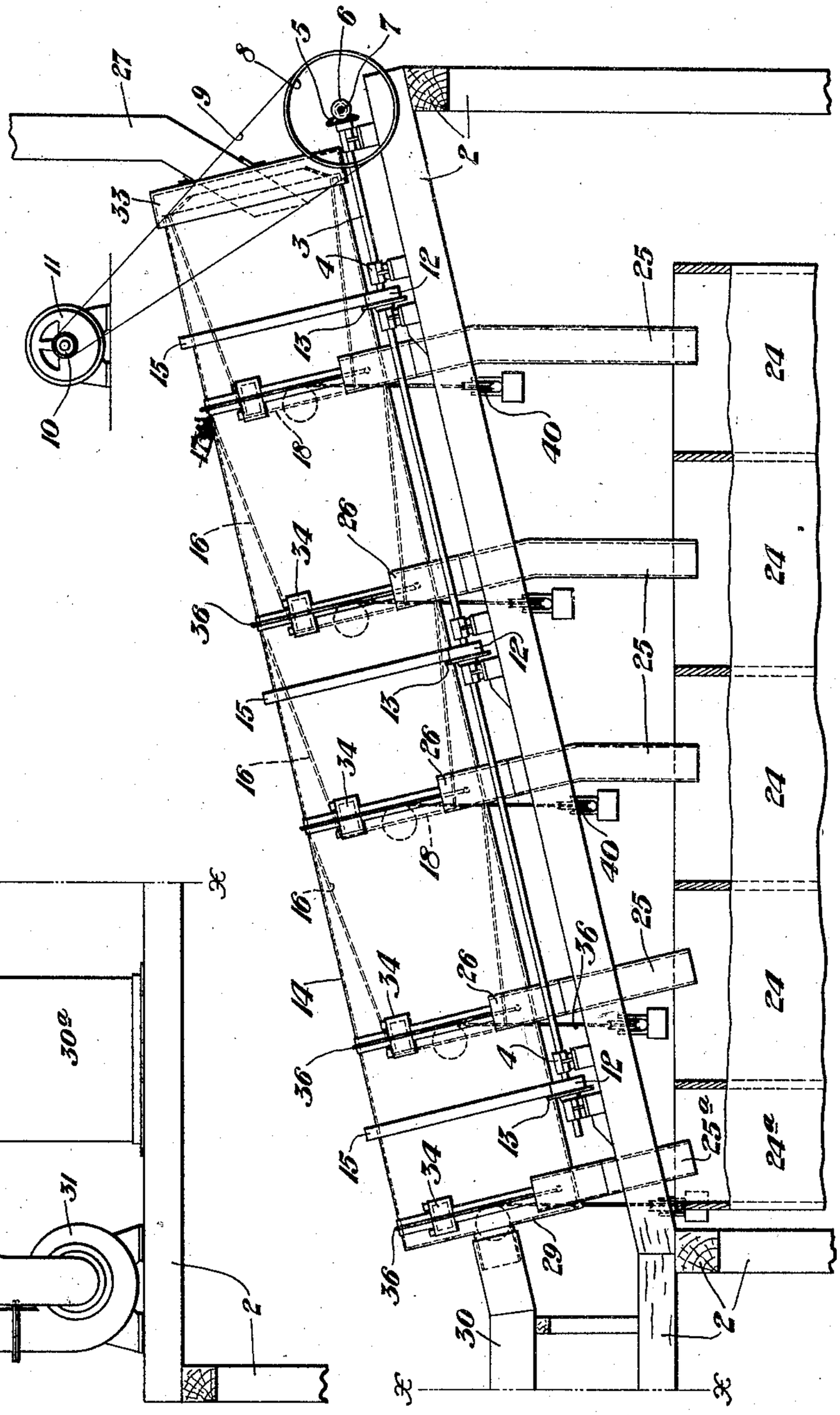

Fig. 1a.

Witnesses:

Edwin Trueb

Inventor:

EDWARD O'TOOLE

by:

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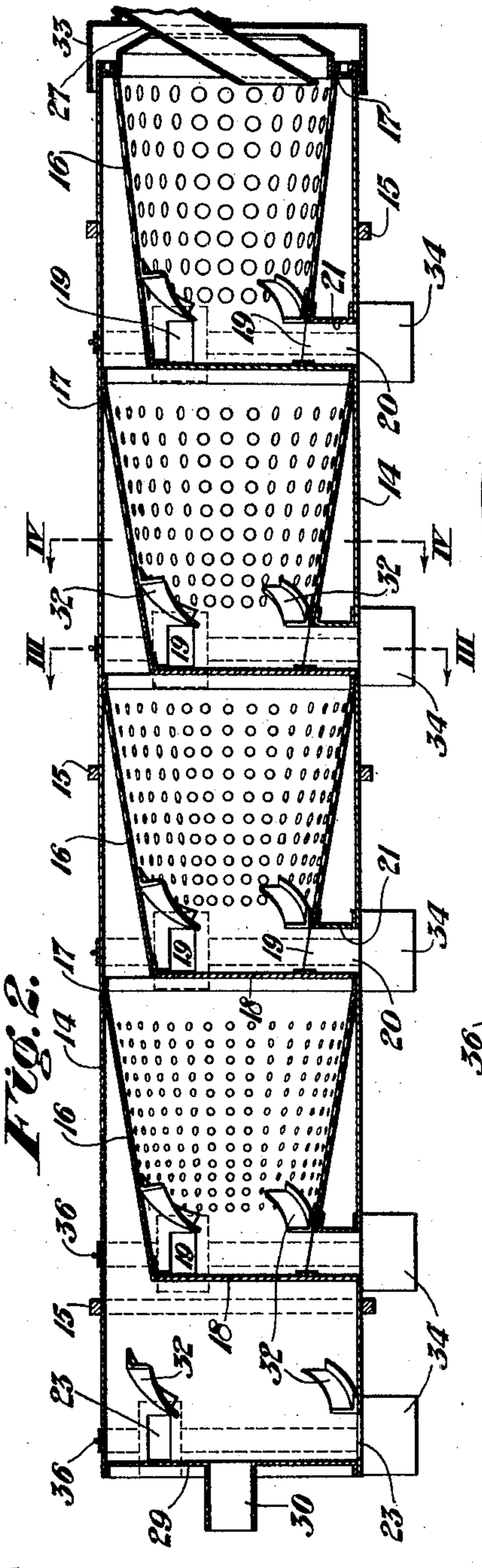

Fig. 2.

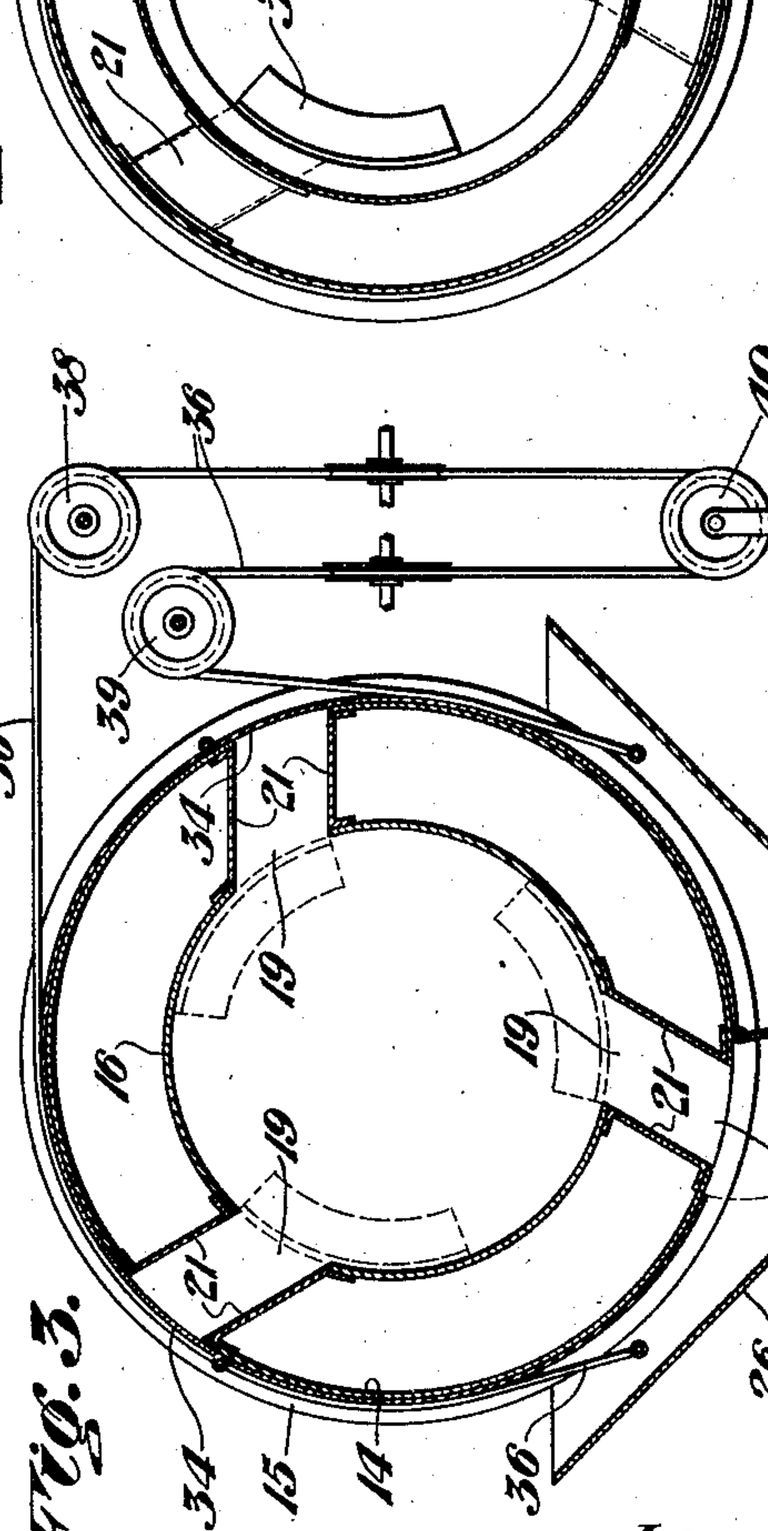

Fig. 3.

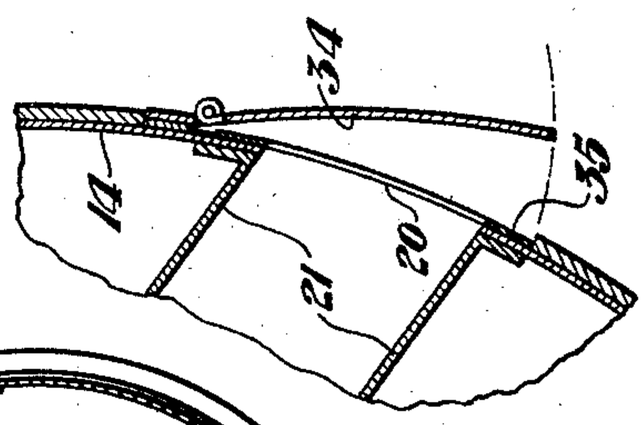

Fig. 4.

Fig. 5.

Witnesses:

Edwin Trued

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Patented Feb. 15, 1927. 1,617,688

UNITED STATES PATENT OFFICE.

EDWARD O'TOOLE, OF GARY, WEST VIRGINIA.

ROTARY SCREEN.

Application filed July 15, 1924. Serial No. 726,156.

This invention relates to rotary screens, and while not limited thereto relates more particularly to rotary screens primarily designed for screening coal and the like, and has for one of its objects the provision of a screen for this purpose, which will deliver the material passing over each screen immediately to separate bins, thereby preventing the breakage of the material.

Another object is to provide an improved screen construction adapted to deliver the separated or screened material direct to suitable bins, thus eliminating the use of separate conveyers.

A further object is to provide a screen of the class described with means for preventing the escape of dust into the atmosphere.

A still further object is to provide a rotary screen having the novel construction, design and combination of parts hereinafter described, and illustrated in the accompanying drawings.

In the drawings, forming part of this specification, Figure 1 is a longitudinal side elevation showing a screen and bins for receiving the screened material embodying my invention.

Figure 1ª is a side elevation showing a continuation of Figure 1. A complete longitudinal side elevation of my improved screening apparatus will be had by joining Figures 1 and 1ª on the lines X—X of these figures.

Figure 2 is a longitudinal section in the plane of the axis of the rotary screen of Figure 1.

Figure 3 is a sectional end elevation, taken on the line III—III of Figure 2.

Figure 4 is a similar sectional elevation on the line IV—IV of Figure 2.

Figure 5 is a sectional detail showing the construction and arrangement of the hinged doors for the outlet openings of my improved screen.

Referring more particularly to the drawings, the numeral 2 designates the supporting frame as a whole, which may be of any well known construction and is inclined downwardly toward its forward end. A shaft 3 is journaled in suitable bearings 4 along each side of the frame 2 and each of said shafts is provided with a bevel gear 5 at its rear end in mesh with a gear 6 on a transverse power shaft 7. A pulley 8 is mounted on the power shaft 7 and is connected by a belt 9 with a suitable pulley 10 on a motor 11. The motor 11 may be supported in its elevated position by any suitable framework or platform (not shown).

The shafts 3 are each provided with a plurality of screen supporting rollers 12, each of which is provided with a bearing flange 13.

The screening device as a whole is supported on the rollers 12 and comprises a hollow cylindrical casing 14 having encircling track members 15 secured thereon adapted to engage the rollers 12.

A plurality of screen members 16 are mounted end to end within the casing 14. The screen members 16 are circular in cross section and taper toward their forward end, forming substantially cone-shaped members. The rear ends of the screen members 16 are open and have their peripheral edge secured to the shell 14 as at 17, while their forward ends are closed by a wall 18.

The screening members 16 are provided with a plurality of outlet openings 19 in line with similar openings 20 in the casing or shell 14, and suitable conduits 21 extend between the openings 19 and 20 and are secured to both the screen members 16 and casing 14. The conduits 21 form passages for the exit of the screened material from the screen members, and also serve to support the forward ends of the screen members 16 in spaced relation with the shell or casing 14.

Suitable angle iron guide vanes 32 are secured on the interior of each screen adjacent the outlet openings 19 and in the forward end of the shell adjacent the outlet openings 23. The vanes 32 are placed on an angle of approximately 35 degrees with the diameter of the screens so that any material that falls into this angle will be forced into the outlet openings. The vanes 32 cause a quicker discharge of the screened material and therefore greatly increase the capacity of the device over a screen without such vanes.

The material passing through the perforations of the screen members travels along the shell or casing 14 by gravity and is delivered within the next succeeding and finer screen, and such operation is continued until the last screen has been passed, when the fine material remaining moves into the forward end of the shell or casing 14 and exits through suitable outlet openings 23.

A plurality of retaining bins 24 for the

separated or screened material are located immediately below the screen and a conduit 25 extends upwardly from each bin and has a hopper-like upper end 26 adapted to receive the discharge from the outlet conduits 21 of the screen member 16 immediately above the bin. A bin 24[a] and a conduit 25[a] are provided at the extreme forward end to receive the fine material discharged through the outlet openings 23 in casing 14.

From the above it will be readily seen that the material failing to pass through each screen is removed immediately from that screen and, therefore, the material to be screened becomes less as it passes to each successive screen 16 and also, due to the fact that it is removed immediately from each successive screen, less breakage of the material results.

In order to prevent the dust, caused by the passage of the material to be screened over the screens, escaping into the atmosphere, I have provided a closure 33 for the inlet or rear end of the shell 14, and hinged closures 34 adapted to be closed over the outlet openings 20 in the shell 14, except when said openings are in communication with the hopper-like upper ends 26 of conduits 25 for discharge of the screened material.

The closure 33 may be supported on the chute 27 or otherwise supported as desired and is fitted freely around the shell 14 so as to permit the rotation of said shell.

The hinged closures or doors 34 are hinged at one side of the outlet openings and adapted to open by gravity. A suitable felt or other soft gasket 35 is secured around the outlet openings so as to form a dust-proof seal with the closure or door when closed.

In order to close the closures or doors 34 as the openings 20 pass out of the position over the upper ends 26 of the conduits 25 and to maintain said closures in closed position until the openings 20 again register with the conduits 25, I provide a closing and binding cable 36 for the series of closures over the openings of each screen.

The cables 36 each have their ends secured to the hopper-like upper end 26 of the conduit 25 at the opposite sides of the shell 14.

The screen is rotated in a counter-clockwise direction. Therefore, the right hand side of the device is the closing side. The closures or doors 34 are, therefore, hinged along the right hand edge of the openings 20 and the right hand stretches of the cables 36 form the closing stretches, while the left hand stretches of the cables form the holding stretches. The cables 36 are looped and the holding stretches are passed over sheaves 38, while the closing stretches are trained over sheaves 39, with the loop hanging downwardly between the sheaves 38 and 39 at the right of the screen and supporting a counter-weighted sheave 40.

The sheaves 38 and 39 may be supported in any desired manner by framing extending upwardly from the main frame 2 of the device or in any other manner desired.

In operation the closures 34 will engage the closing stretches of the cables 36 as they pass out of the hopper portion 26 of the conduits 25 and thus forced to closed position. As the screen continues to revolve the closures will pass from engagement with the closing stretches of the cables and engage the holding stretches and thus be prevented from opening until they are again within the hoppers 26 and free of the holding stretches of the cables.

It will thus be seen that little if any dust will escape from this improved form of screening device.

The material to be screened enters through a chute 27, which passes through the closure 33 and delivers the material onto the rear screen member 16 and, as said before, the material passing through the screens moves by gravity forwardly over the successive screens 16, due to the inclined position of the device. The forward end of the casing or shell 14 is closed by an end wall 29 which has a centrally arranged conduit 30 secured therein which leads to a suitable dust catcher 30[a] and exhaust fan 31, so that the dust laden air is exhausted from the screen and the dust collected in the dust catcher 30. The dust catcher 30 and exhaust fan 31 may be of standard commercial design and, therefore, are not shown or described in detail.

While I have shown and described one specific embodiment of my invention, I do not wish to be limited thereto since various modifications in design and minor details of construction may be made without departing from the scope of my invention as defined in the appended claims.

I claim:—

1. A rotary screen for coal and the like having a plurality of outlet openings to permit the discharge of the screened material, closures for said openings adapted to open by gravity, means for closing said closures and for holding said closures in closed position except when discharging screened material, means for exhausting dust laden air from said screen and means for separating the dust from said air.

2. A rotary screen for coal and the like comprising a hollow imperforate casing, a plurality of screen members in said casing, a plurality of outlet conduits extending from each of said screen members through said casing, means for receiving the material discharged through said conduits, closures hingedly mounted on said shell and adapted to close said outlet conduits, said closures

being adapted to automatically swing to open position when brought into position over said receiving means, and means for automatically closing said closures as they pass from over said receiving means and for holding said closures in closed position until they again move into position over said receiving means.

3. A rotary screen for coal and the like comprising a hollow imperforate casing, a plurality of screen members in said casing, a plurality of outlet conduits extending from each of said screen members through said casing, means for receiving the material discharged through said conduits, closures hingedly mounted on said shell and adapted to close said outlet conduits, said closures being adapted to automatically swing to open position when brought into position over said receiving means, means for automatically closing said closures as they pass from over said receiving means and for holding said closures in closed position until they again move into position over said receiving means, and means for exhausting dust laden air from said screen, and means for separating the dust from said air.

In testimony whereof I have hereunto set my hand.

EDWARD O'TOOLE.