

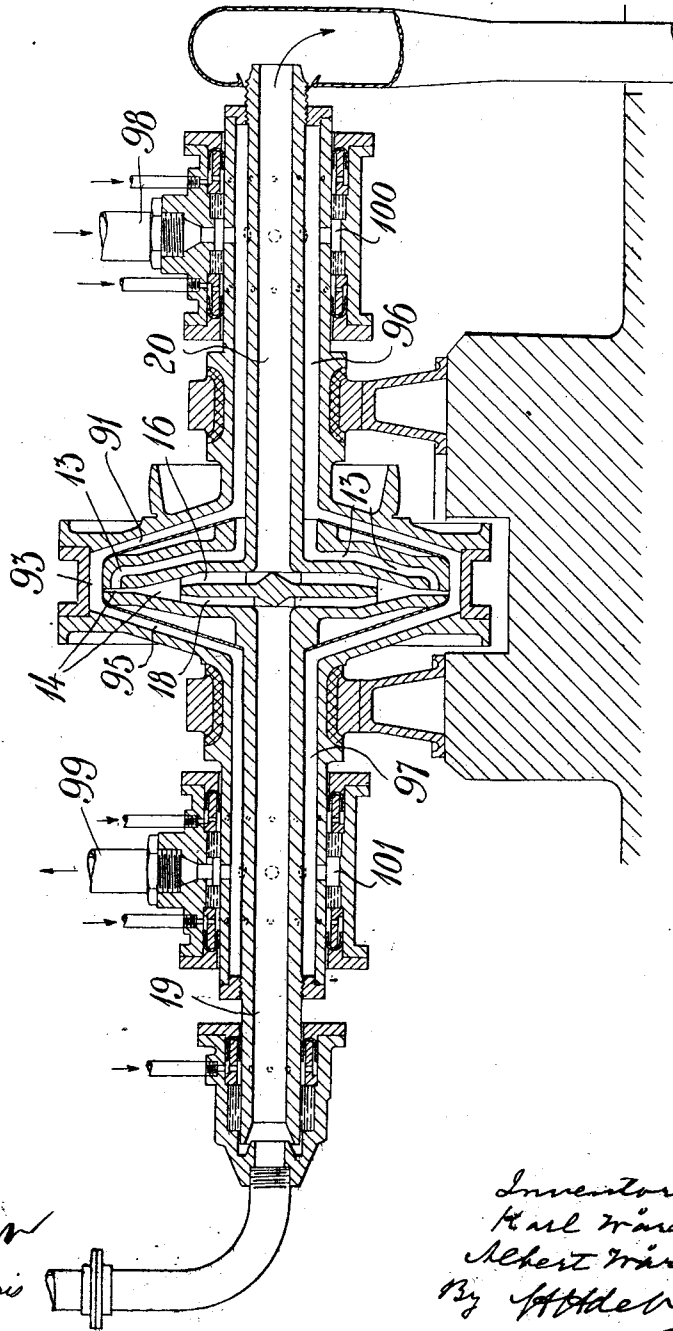
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SEPARATOR.

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SEPARATOR.

1,052,777.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, KARL WÄRD and ALBERT WÄRD, mining engineers, subjects of Sweden, residing at 39 Odengatan, Stockholm, Sweden, have invented new and useful Improvements in Separators, of which the following is a specification.

The present invention relates to an apparatus for assorting solid particles as to their specific gravity or size, or in other words, separating and classifying them.

The apparatus is adapted for introducing a fluid containing the particles into one or more passages (separating-passages) rotating about an axis, through which passages the said fluid is forced outward against a surrounding chamber containing a fluid of a pressure sufficient to prevent the fluid first mentioned and a larger or smaller portion of the solid particles from being flung out into the outer chamber, the solid particles thus being assorted as to their specific gravity or size and an actual classification being accomplished.

The accompanying drawing shows a longitudinal section of a separator with a horizontal axis and intended for separating and classifying solid particles, contained in a fluid as to their specific gravity or size; in this machine the chamber surrounding the system of passages is not stationary but partakes in the rotation.

The apparatus thus illustrated comprises a closed receptacle 93 which is shown as rotating, and a rotating element therein. In said rotating element different radial passages or channels are arranged, viz., separating channels 14 which discharge at the periphery of the element into the surrounding receptacle, supply channels 18 leading from a hollow shaft portion 19 to the inner ends of said separating channels, discharge channels 16 leading from the inner ends of the channel 14 to another hollow shaft portion 20 and finally channels 13 discharging into the outer ends of the channels 16 and leading from an annular channel 96 surrounding the shaft portion 20. The said annular channel 96 communicates with a stationary supply pipe 98, which is fed from a pump and discharges into a stuffing box 100. Through channels or passages 91, the annular channel 96 communicates with the peripheral portion of the receptacle 93, which in turn through passages 95 commu-

nicates with another annular channel 97 surrounding the shaft portion 19. This channel 97 through a stuffing box 101 communicates with a stationary discharge pipe 99.

The classification of solid particles according to their specific gravity or size by means of the apparatus just described is carried out in the following manner: While keeping the whole rotary system rotating at a convenient speed a fluid carrying in suspension the solid particles to be classified is introduced at the left end of the machine through the hollow shaft 19. At the same time, a fluid is introduced by means of the pump above referred to through the pipe 98 into the annular channel 96. A portion of this fluid passes through the passages 91 into the peripheral portion of the receptacle 93 where it assumes a pressure depending partly on the pressure under which it is introduced by the pump, partly on the speed of rotation. Another portion of the said fluid enters the channels 13. The fluid introduced through the hollow shaft portion 19 passes outward through the channels 18 into the channels 14. The pressure of the fluid in the receptacle 93 as well as in the channels 13 is sufficiently high not only to prevent any fluid from the channels 14 from passing into said receptacle or channels, but even to force some fluid to take the opposite way, viz., from the receptacle 93 and channels 13 into the channels 14. Of the solid particles suspended in the fluid in the last mentioned channels, some, however, are large and heavy enough to pass, under the action of the centrifugal force, outward against the just named currents of fluid into the surrounding receptacle 93, while the smaller or lighter particles are prevented by the fluid from taking this way. These particles therefore will remain in the fluid in the channels 14 which fluid under the action of the currents from the outside and from the channels 13 will be forced inward through the channels 16 and passes away through the hollow shaft portion 20 to any suitable place where the aforesaid smaller or lighter solid particles will be allowed to settle. The larger or heavier particles which have been ejected into the receptacle 93, on the contrary, are carried forth by the current of fluid coming from the passages 91 into the passages 95 and

from there through the annular passage 97, box 101 and stationary pipe 99 to any suitable settling place.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that we claim:

In combination a closed receptacle, a rotating element therein provided with one or more outwardly extending separating channels opening into said receptacle, means for supplying material to be separated to the inner ends of said channels, said element having passages for supplying a separating

fluid to said channels near the outer ends thereof, and means for maintaining a fluid pressure in the receptacle sufficient to allow the passage of only the heavier material thereinto, and means for separately discharging the lighter material.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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ALBERT WÅRD.

Witnesses:

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