

March 17, 1942.

J. H. V. FINNEY

2,276,539

MATERIAL CLASSIFIER

Filed Sept. 7, 1940

4 Sheets-Sheet 1

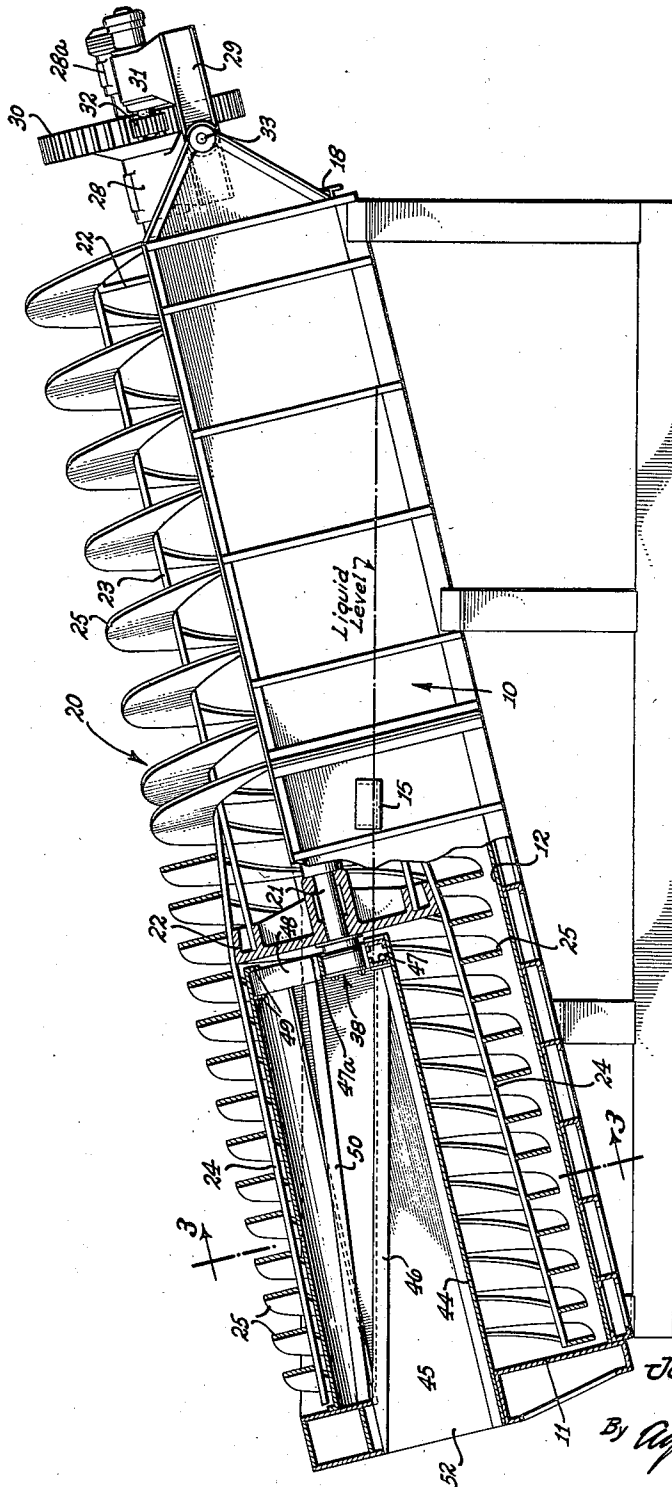


Fig. 1.

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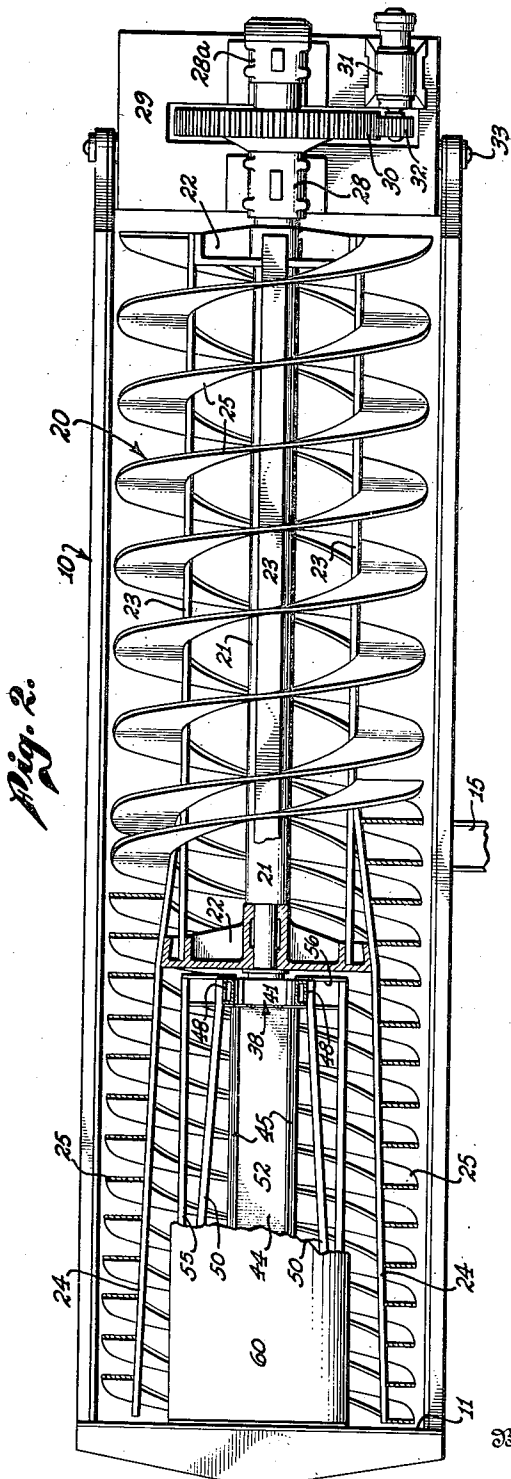
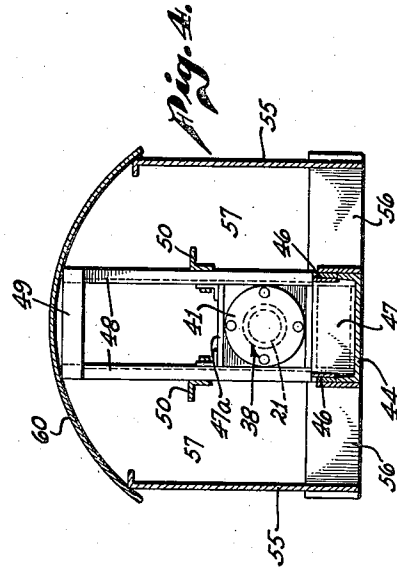
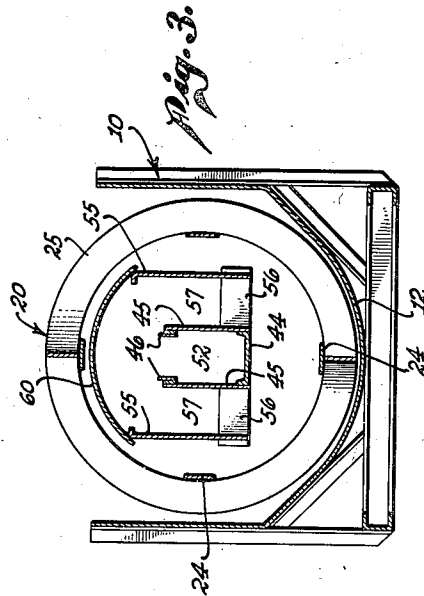
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MATERIAL CLASSIFIER

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4 Sheets-Sheet 2



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MATERIAL CLASSIFIER

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4 Sheets-Sheet 3

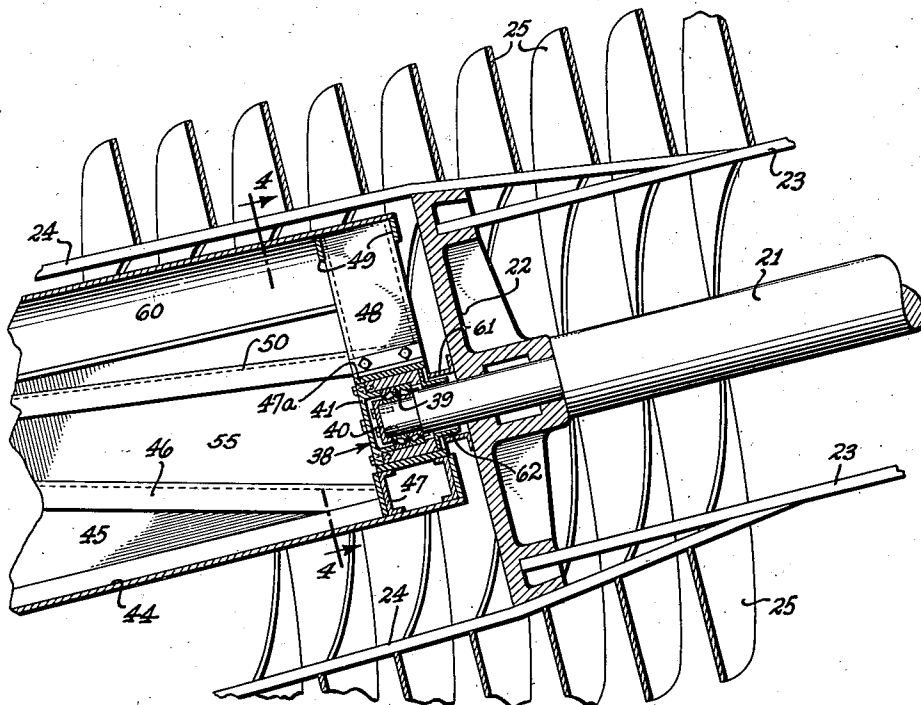


Fig. 5.

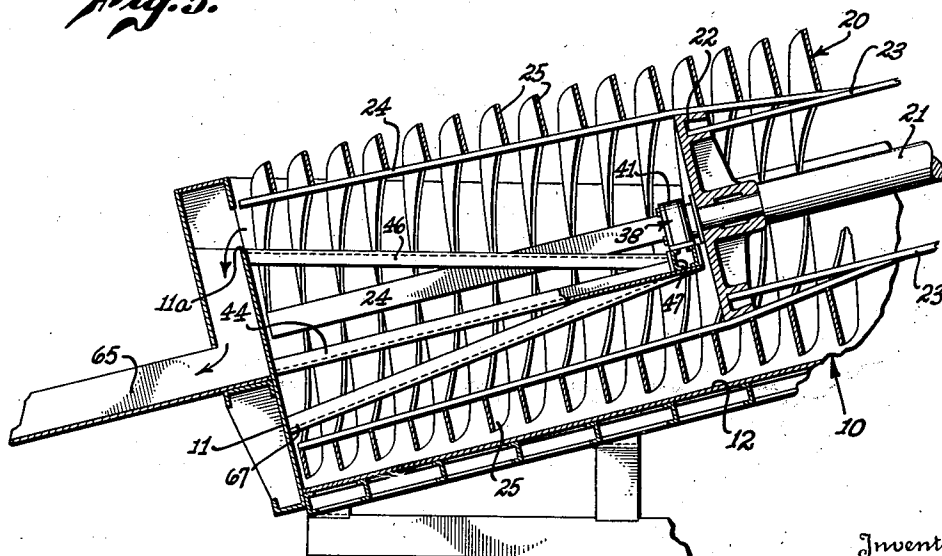


Fig. 6.

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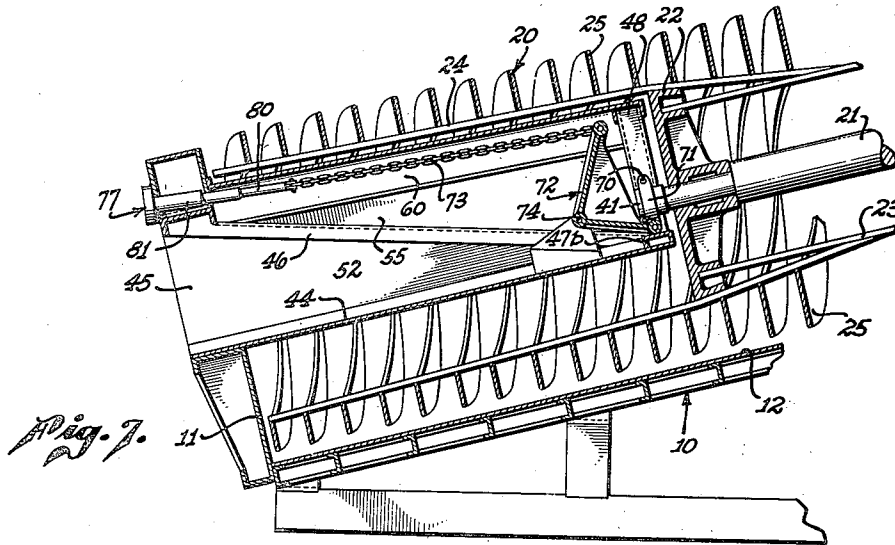
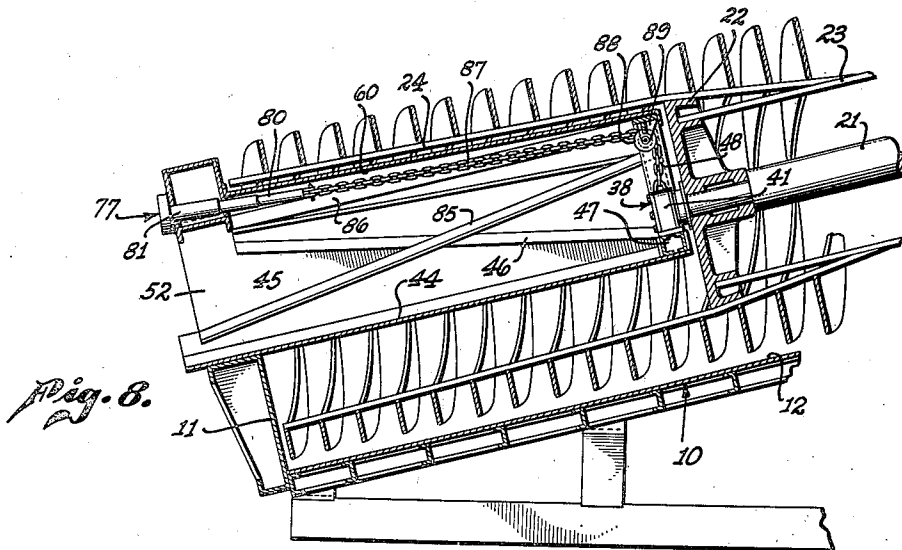
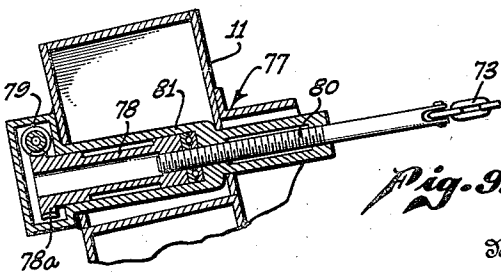
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MATERIAL CLASSIFIER

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,276,539

MATERIAL CLASSIFIER

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Application September 7, 1940, Serial No. 355,737

11 Claims. (Cl. 209—464)

The present invention is concerned generally with material classifiers of the kind used chiefly in handling ores during metallurgical operations, and more especially with improvements in classifiers wherein solid particles are suspended in a body of liquid, usually water, from which the particles settle out according to size and density, and the settled particles are removed from the classifier by rotary conveying means. Classifiers of this general type are disclosed in my Patents Nos. 2,189,418 and 2,189,419, granted to me on February 6, 1940, for improvements in "Material classifier."

There have been many different classifiers using a spiral or screw-type conveyor for removing the oversize particles from the body of liquid in the classifier tank; and the most universal and well known weakness in these devices has been in the bearing rotatively supporting the lower end of the conveyor. Because the conveyor must of necessity extend below the liquid surface substantially to the end of the tank, this lower bearing has been submerged in the tank liquid where it is in contact with the liquid and the abrasive particles suspended therein. These abrasive particles are small enough to enter the bearing and cause excessive wear, necessitating frequent removal and replacement of the worn bearing, with very considerable expense for parts, labor, and loss of time while the equipment is shut down. Many expedients have been resorted to in an attempt to prevent entry of liquid and abrasive particles into a submerged bearing, and among these expedients there have been special types of bearings, packing rings and seals, pressure lubrication designed to maintain a lubricant pressure inside the bearing equal to or greater than the liquid pressure outside the bearing, and others.

In general, these devices can be regarded as no more than moderately successful from a practical viewpoint, since they have not succeeded in eliminating the difficulties inherent in a submerged bearing. Such devices have not completely prevented entry into the bearing of submerged particles, and, unless very carefully attended to, they frequently fail mechanically and deprive the bearing of any protection they may afford. Submerged bearings have often been considered the weakest point in classifiers using a screw conveyor, and have been particularly objectionable when it is desired to place a classifier in continuous operation twenty-four hours a day because these bearings are the most frequent cause of mechanical failures requiring interruption of plant operation.

Thus it becomes a general object of my invention to provide a bearing construction for a classifier which eliminates the disadvantages inherent in conventional submerged bearings.

More particularly, it is an object of my in-

vention to provide a bearing construction and supporting means therefor in a classifier of the character described in which the bearing is supported above the liquid level, thus eliminating the necessity of sealing the bearing against entry of abrasive particles carried by the liquid in the classifier.

In a classifier having a tank adapted to hold a body of liquid with solid particles therein and a rotary screw conveyor for moving settled particles out of the tank, these objects of my invention are attained by providing a cantilever supporting structure on which the bearing for the screw conveyor is supported at a position spaced from the end of the tank. The cantilever supporting structure is mounted on the upwardly extending walls of the tank, preferably the end wall, and extends forwardly over the bed of the tank, and preferably extends a sufficient distance that the bearing may be mounted on the unsupported end of the cantilever structure at a position where the bearing is entirely above the liquid level in the tank. In any event, the upper end of the bearing is above the liquid level. The lower end of the central shaft of the screw conveyor is journaled in the bearing, and the lower end section of the conveyor is built as an annular cantilever section which surrounds the structure supporting the shaft bearing, thus allowing the conveyor to extend substantially to the end wall of the tank if desired.

In a preferred form of my invention, the cantilever supporting structure for the bearing also carries the outlet launder which provides means for discharging liquid from the tank. For this purpose, the cantilever structure is provided with suitable wall means which not only form the walls of the launder but also provide weirs over which the tank liquid flows.

In those types of classifiers which are provided with means for slightly raising the lower end of the conveyor in order to free it of the sands which settle down around the screw conveyor after a shut-down, the means for lifting the conveyor bearing and the lower end of the conveyor may also be supported on the same cantilever structure as the conveyor bearing, or the lifting means may be supported on a second cantilever structure which is mounted on the tank walls in a manner similar to the first one and extends over and above the first cantilever structure.

Although I show and describe my present invention in conjunction with classifiers of the type shown in my above-enumerated patents because of its particular adaptability thereto, my invention is not limited thereto but may be applied to other types of classifiers.

How these objects and advantages of my invention, as well as others not specifically mentioned, are attained will be more readily under-

stood by reference to the following specification and the annexed drawings, in which:

Fig. 1 is a side view, partly in elevation and partly in section, of a classifier constructed according to my invention;

Fig. 2 is a plan view of the classifier of Fig. 1;

Fig. 3 is a transverse section taken on line 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmentary transverse view on line 4—4 of Fig. 5 of the upper end of the bearing support;

Fig. 5 is an enlarged fragmentary vertical section showing the lower shaft bearing of the conveyor mounted on the cantilever bearing support;

Fig. 6 is a fragmentary vertical section of a simplified form of classifier in which the cantilever supporting structure carries only the shaft bearing;

Fig. 7 is a view similar to Fig. 6 showing another form of the invention in which means for lifting the shaft bearing is mounted on the cantilever supporting structure;

Fig. 8 is a fragmentary vertical section of another form of my invention in which a second cantilever structure is provided to carry means for lifting the conveyor and bearing; and

Fig. 9 is a fragmentary section of the lead screw for lifting the conveyor.

The classifier illustrated in Figs. 1-5 has a tank generally indicated at 10, which is adapted to contain a body of water or other liquid carrying solid particles that are to be classified. The tank is formed by walls which extend upwardly around inclined bed 12, the side walls of the tank being vertical and end wall 11 generally so, although it is preferably disposed at right angles to bed 12. The bottom wall or bed of the tank slopes uniformly throughout the length of the tank, and may be flat or transversely curved, as shown in Fig. 3. The lower portion of the bed is submerged beneath the liquid body, as shown in Fig. 1, and the upper end of the tank extends above and beyond the liquid level to form a draining deck. As the coarse particles or sands are moved over the deck, the excess liquid draining from them runs back into the tank.

A stream of liquid carrying the solid particles in suspension is brought to the tank from any suitable source by inlet launder 15 which may discharge into the tank in any suitable position or manner. The coarse particles settle out of the liquid in the tank onto inclined bed 12 and suitable rotary conveying means, generally indicated at 20, is provided to move the sands out of the liquid and up bed 12 to discharge lip 18 at the upper end of the bed, over which lip the sands are discharged from the classifier. The fine particles remain in suspension in the liquid and are carried with it from the classifier by way of the liquid outlet means which will be described later.

The conveying means generally indicated at 20 comprises a central rotating shaft 21 on which two or more spiders 22 are mounted. The outwardly extending arms of spiders 22 are supports to which are secured longitudinally extending braces 23 and 24. As may be seen from Figs. 1 and 2, there are four sets of braces 23 and 24, and consequently each spider 22 is provided with four arms spaced 90 degrees apart around shaft 21; but, of course, a larger or smaller number of arms and braces may be used if desired. Flights of helical ribbon 25 are secured to the braces and pass around the out-

side faces of the longitudinally extending members 23 and 24. These longitudinal braces are attached to the radial arms of spiders 22 at points removed from center shaft 21 so that an annular space is left between the shaft and ribbons 25.

This annular construction of the screw conveyor is particularly to be noted in connection with the end section of the conveyor which lies between spider 22 and end wall 11 of the tank. Braces 23 and 24 and ribbon flights 25 form a rigid truss structure mounted on shaft 21 to be rotated thereby. Since spider 22 is spaced a considerable distance from tank end wall 11, the end section of the screw conveyor is a cantilever supported at its upper end. The strength of this cantilever end section is increased somewhat by using, in the cantilever section, braces 24 as shown, although it will be understood that instead braces 23 may be extended the entire length of the screw conveyor, if desired.

Considerable choice may be exercised in forming ribbon flights 25 on the screw conveyor. In the construction shown, the depth or radial width of the flights increases upwardly along the screw conveyor since the amount of sands to be handled increases toward the upper end of bed 12. Likewise, the pitch of the spiral ribbons may be changed. This is done in effect in the construction shown by placing four spiral ribbons on the lower end of the screw conveyor and two ribbons on the upper end.

The upper end of the central drive shaft 21 is journaled in bearings 28 and 28a mounted on platform 29. Bearings 28 and 28a are spaced apart and gear 30 is mounted on shaft 21 between the bearings. Motor 31, also mounted on platform 29, drives pinion 32 which meshes with gear 30 and thus causes shaft 21 to rotate carrying with it ribbon flights 25.

Platform 29 is pivotally mounted at 33 to rigid extensions of the side walls of tank 10. Although this construction permitting the conveyor driving mechanism to move about a horizontal axis 33 need not be employed where the bearing for the lower end of shaft 21 is fixed, it has a particular advantage where the lower end of the drive shaft is mounted for vertical movement, as in forms of the invention later to be described. Mounting the driving mechanism for the screw conveyor in this manner eliminates the necessity of a universal joint or the like in shaft 21.

A bearing indicated generally at 38 is provided for the lower end of shaft 21. This bearing may be of any suitable construction; but by way of illustrating one type of bearing there is shown in Fig. 5 a roller bearing 39 held on the end of the shaft by cap 40. This bearing assembly is enclosed within housing 41 which engages and supports the outer races of bearing 39.

The shaft bearing at 38 is removed a considerable distance from the end of tank 10 and also from the end of screw conveyor 20 which preferably extends substantially to end wall 11, and the shaft bearing is supported in this position from the tank walls, preferably from end wall 11. This support is a cantilever structure having a pair of triangularly shaped side members connected together at their lower edges into a unitary structure by a member which forms the bottom of an outlet launder. The cantilever structure includes bottom channel member 44 attached at one end to tank wall 11 and extending inwardly of conveyor 20 over and above tank bed 12 and in a direction generally parallel to

the axis of shaft 21. On either side of channel 44 and connected together thereby is a vertically extending, triangularly shaped plate 45 which is provided at its upper edge with a reinforcing brace 46 (see Figs. 1 and 3).

At the inner or upper end of channel 44 is a box-like cross-member 47 on which bearing housing 41 rests. At either side of housing 41 is an upwardly extending channel 48 attached to the ends of the cross-member 47 (see Fig. 4). The two members 48 are tied together at their tops by other cross-members 49, and longitudinal braces 50 extend between end wall 11 and up-rights 48. The uprights 48 hold bearing housing 41 against lateral movement, and housing 41 is held against vertical movement by bolting it to lower cross-member 47, or by a hold-down bracket 47a over the housing.

This cantilever support extends forwardly from the end wall of the tank over the inclined bed and in the direction of the axis of the conveying means to a position within the periphery of conveyor 20 which is above and inwardly of the lower end of the conveyor. In this way, the cantilever supports the shaft bearing at a position spaced from end wall 11 by a distance preferably sufficient to locate the bearing above the liquid level in the tank, thus eliminating the possibility of abrasive particles being carried into the bearing by the tank liquid.

End wall 11 of the tank is provided with a central opening through which channel 44 and side plates 45 extend, and the space between these members forms an overflow launder 52 by means of which liquid and fine solid particles suspended therein are discharged from the tank. The upper edges of plates 45 and reinforcing bars 46 are horizontal and form a weir over which the liquid flows to be discharged into launder 52. The lower end of launder 52 is open and may discharge into any suitable receptacle.

In this preferred form of my invention, a vertically extending baffle plate 55 is placed on either side of launder 52 and spaced from vertical side walls 45. Baffles 55 are attached at one end to tank wall 11 and are supported at their forward ends by a bracket 56 attached to the cantilever supporting structure described above.

Side walls 45 of the launder and baffles 55 are preferably vertical and parallel to each other. Each side wall 45 and its associated baffle 55 form vertically extending wall means which define between them a vertically extending space 57 which is termed a sorting column. At the top of each of the two sorting columns 57, the horizontal edges of members 45 and 46 form an overflow weir. The velocity of the liquid flowing vertically through sorting columns 57 determines the size of particles carried in suspension by the liquid over the weirs and into the overflow launder. Baffles 55 extend from a point above the normal liquid level to a point below that liquid level in order to prevent liquid from reaching and overflowing the weirs except by passing through the sorting columns. Since the size of separation between particles settled out and the particles carried over in suspension is determined by the liquid velocity, and this in turn depends upon the cross-sectional area of the sorting columns, suitable means (not shown) may be provided if desired to movably mount baffles 55 in such a manner that they may be moved toward and away from launder walls 45 to adjust the size of particle separation.

For further details of this and other construc-

tions of the centrally extending overflow launder 52 and the associated sorting columns, reference should be made to my two patents mentioned above, in which these constructional features are described in further detail and are claimed.

An arcuate shield 60 spans the distance between the two baffles 55 and extends the length of launder 45. This shield prevents solid particles picked up by the screw conveyor from dropping into launder 52 or into either of the sorting columns.

A somewhat similar device may be employed to prevent solid particles picked up by the conveyor from dropping into shaft bearing 39. As may be best seen in Fig. 5, there is provided a pair of telescoping collars 61 and 62 of different diameters so that one extends into the other. The larger of these collars 61 is attached to spider 22 to rotate therewith, while the smaller one is stationary and is affixed to bearing housing 41. Any liquid or solid particles picked up by the conveyor and dropped onto collar 61 will either be deflected back into the liquid body in the tank or will run off the larger collar onto the smaller one 62 which directs the foreign material back into the tank. These two collars thus provide a baffling arrangement which protects the upper end of the bearing from the entry of any foreign matter that may be dropped onto it during the rotation of conveyor 20.

Fig. 6 illustrates a simplified form of my invention in which the centrally extending longitudinal launder, the baffles forming the two sorting columns, and the shield over the launder and sorting columns have been omitted, and the construction of the cantilever support for the shaft bearing has been modified accordingly. Otherwise the construction of this embodiment of my invention is the same as described above, there being no changes in the conveyor mechanism and only minor changes in the tank, which will now be described.

Tank end wall 11 has been modified by closing the central opening therein and extending the end wall upwardly only to the height at which it is desired to maintain the liquid in the tank, the upper edge of end wall 11 thus forming a transversely extending overflow weir at 11a over which the liquid in the tank discharges to drop into outlet launder 65. Since the cantilever support no longer carries the outlet launder, side plates 45 may also be omitted from this construction. The cantilever support now comprises channel 44, upper braces 46, and lower braces 67, which form an open, triangularly shaped truss mounted at its lower end on tank wall 11 and carrying at its upper end the transverse box-like member 47 to which is secured housing 41 for the shaft bearing. In this simplified form of my invention, the cantilever support carries only the bearing for the rotary conveying means, but it will be seen that, as previously described, this structure extends from the end of the tank inwardly and axially of the conveying means to a position within the periphery of the conveyor, at which position the bearing is supported above the liquid level in the tank and is thus free of the possibility that tank liquid can enter the bearing and carry into it abrasive particles.

Fig. 7 shows another form of my invention which is the same in all respects as the form described in connection with Figs. 1-5 except for the addition thereto of means movably mounting the shaft bearing and means for raising the shaft bearing and the lower end of the conveyor

for a limited distance. This particular construction is used frequently when a classifier is subject to intermittent operation, since after a shut-down the sands settle to the bottom of the tank and create so much resistance to rotation of the conveyor that it cannot be started. It can, however, be free from the sands by lifting it a short distance by some such means as is shown in Fig. 7.

In the construction shown in this figure, the housing 41 for the shaft bearing is suspended by a pin connection at 70 from the top of a yoke 71, the bottom of the yoke being pivotally connected to bell-crank 72. Bell-crank 72 has two arms at approximately 90 degrees to each other. One arm extends forwardly and is attached to yoke 71, and the other arm extends upwardly and is attached to chain 73 by means of which bell-crank 72 is rotated about its pivotal mounting 74 on channel 44.

When conveyor 20 is in its normal operating position, the weight of the conveyor is transmitted through yoke 71 and its connection to the forward arm of bell-crank 72, directly to cross-member 47a as the forward end of this bell-crank arm rests directly upon cross-member 47a of the cantilever support. When bell-crank 72 is rotated counter-clockwise as viewed in Fig. 7, by means which will presently be described, the weight of the conveyor is transmitted through the bell-crank and pivot 74 to the channel 44 of the cantilever supporting structure. It will be noted that in this embodiment of my invention, the cantilever support, in addition to carrying the bearing for shaft 21 and the loads thereof, also carries suitable wall means providing a liquid outlet launder 52.

The lead screw mechanism for rotating bell-crank 72 is indicated generally at 77, and is shown in greater detail in Fig. 9. This mechanism comprises a hollow sleeve 78 which has on one end a gear 78a that engages and is driven by worm gear 79. Sleeve 78 has internal threads which engage lead screw 80, and rotation of sleeve 78 by worm 79 causes lead screw 80 to move toward the right or left according to the direction of rotation of sleeve 78. The gears, sleeve, and lead screw are enclosed in a housing 81 that also provides a guide for the lead screw. Screw 80 is attached to chain 73 which in turn is attached to the upper arm of bell-crank 72. Worm gear 79 is preferably driven by an electric motor or similar means, not shown. When sleeve 78 is rotated in one direction, lead screw 80 is moved toward the left and the pull on chain 73 causes bell-crank 72 to rotate in a counter-clockwise direction and lift bearing 38 for conveyor shaft 21, and also of course the entire lower end of the conveying means. When this lifting action takes place, the entire conveyor 20 rocks about pivot 33 which supports the drive means for the conveying mechanism, as shown in Fig. 1.

There is shown in Fig. 8 another modification of my invention which is substantially the same as the form shown in Figs. 1-5, inclusive, except for the addition thereto of a second cantilever structure on which is supported a variational form of means for lifting the shaft bearing. This second cantilever structure includes lower braces 85 and upper braces 86 which are attached at their forward ends to uprights 48. Since uprights 48 are also attached to the above described cantilever structure comprising channel 44, plates 45, and braces 46, the second cantilever, which extends over and above the first cantilever, is tied

thereto so that the whole structure is a single rigid unit. However, it will be realized that the two cantilevers may be actually separate at their forward ends, although both are mounted on the same wall of the tank.

Lower braces 85 may be a pair of angle-shaped members, or may be conveniently formed from a single channel which fills in the space between walls 45 of launder 52, and in this latter construction liquid overflowing weir members 46 in the rear half of the launder drops onto channel 85 and runs down the channel to the rear end thereof before it actually discharges onto channel 44.

The means mounted on this second cantilever structure for lifting the bearing and the lower end of conveyor 20 includes a chain 87 which runs over pulley 88 that is mounted on bracket 89. Bracket 89 is carried by a transverse member extending across between the two upper truss members 86, so that a load on the pulley is carried by the second cantilever. One end of chain 87 is attached to housing 41 of the shaft bearing at 38, while the other end of the chain is attached to lead screw 80 of the chain-operating mechanism indicated at 77. This lead screw mechanism is the same as previously described in connection with Figs. 7 and 9.

Rotation of sleeve 78 retracts screws 80 and chain 87, lifting the shaft bearing 38. When thus lifted, the weight of the lower end of the screw conveyor is carried on pulley 88 and the upper cantilever structure. When lowered as in Fig. 8, the weight is carried on the lower cantilever. Uprights 47 act as guides for the bearing during vertical movement.

The above description discloses various embodiments of my invention in which a cantilever supporting structure is mounted on a wall of the classifier tank and projects inwardly of the lower end of the screw conveyor to support the conveyor shaft bearing above the liquid level in the tank. Also, the cantilever may additionally carry either the outlet launder or means to lift the shaft bearing and the conveyor, or both. As a variation, a second cantilever may be placed above the first one to carry the bearing lifting means. From such disclosure it will be evident that various changes in the form and arrangement of parts may be made without departing from the spirit and scope of my invention, and consequently it is to be understood that the above description is to be construed as illustrative of rather than limitative upon the invention defined in the appended claims.

I claim:

1. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on the end wall of the tank and extending over the inclined bed and into the end of the rotary conveying means; and a bearing for the rotary conveying means mounted on the cantilever structure and supported thereby at a position spaced from said end wall.

2. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a

cantilever supporting structure mounted on a tank wall and extending over the inclined bed and into the end of the rotary conveying means; and a bearing for the rotary conveying means mounted on the cantilever structure and supported thereby at a position above the liquid in the tank.

3. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending generally in the direction of the axis of the conveying means to a position within the periphery and above the lower end of the conveying means; and a bearing for the rotary conveying means mounted on the cantilever structure and supported thereby at a position above the liquid in the tank.

4. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: said conveying means comprising a screw conveyor with a central shaft and an annular cantilever end section at its lower end; a cantilever supporting structure mounted on a tank wall and extending into said end section of the conveying means; and a bearing for the lower end of the central shaft mounted on the cantilever structure and supported thereby at a position spaced from said tank wall.

5. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending over the inclined bed and into the end of the rotary conveying means; a bearing for the rotary conveying means mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; and liquid outlet means carried by the cantilever structure.

6. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: said conveying means comprising a screw conveyor with a central shaft and an annular cantilever end section at its lower end; a cantilever supporting structure mounted on a tank wall and extending into said end section of the conveying means; a bearing for the lower end of the central shaft mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; and wall means mounted on the cantilever structure forming overflow type liquid outlet means for the tank.

7. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending over the inclined bed

and into the end of the rotary conveying means; a bearing for the rotary conveying means movably mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; and means mounted on the cantilever structure for lifting the bearing and the lower end of the conveying means.

8. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending over the inclined bed and into the end of the rotary conveying means; a bearing for the rotary conveying means movably mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; means mounted on the cantilever structure for lifting the bearing and the lower end of the conveying means; and liquid outlet means carried by the cantilever structure.

9. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: said conveying means comprising a screw conveyor with a central shaft and an annular cantilever end section at its lower end; a cantilever supporting structure mounted on a tank wall and extending into said end section of the conveying means; a bearing for the lower end of the central shaft movably mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; and means mounted on the cantilever structure for lifting the bearing and the lower end of the conveying means.

10. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending over the inclined bed and into the end of the rotary conveying means; a bearing for the rotary conveying means movably mounted on the cantilever structure and supported thereby at a position above the liquid in the tank; a second cantilever structure mounted on a tank wall and extending above the first mentioned cantilever structure; and means mounted on the second cantilever structure for lifting the bearing and the lower end of the conveying means.

11. In a material classifier having a tank adapted to hold a body of liquid and solid particles therein to be classified, said tank having walls extending upwardly around an inclined bed, and rotary conveying means for moving settled particles along the tank bed, the combination of: a cantilever supporting structure mounted on a tank wall and extending generally in the direction of the axis of the conveying means to a position above the liquid in the tank and within the periphery and above the lower end of the conveying means; and a bearing for the rotary conveying means mounted on the cantilever structure and supported thereby at said position above the liquid in the tank.