

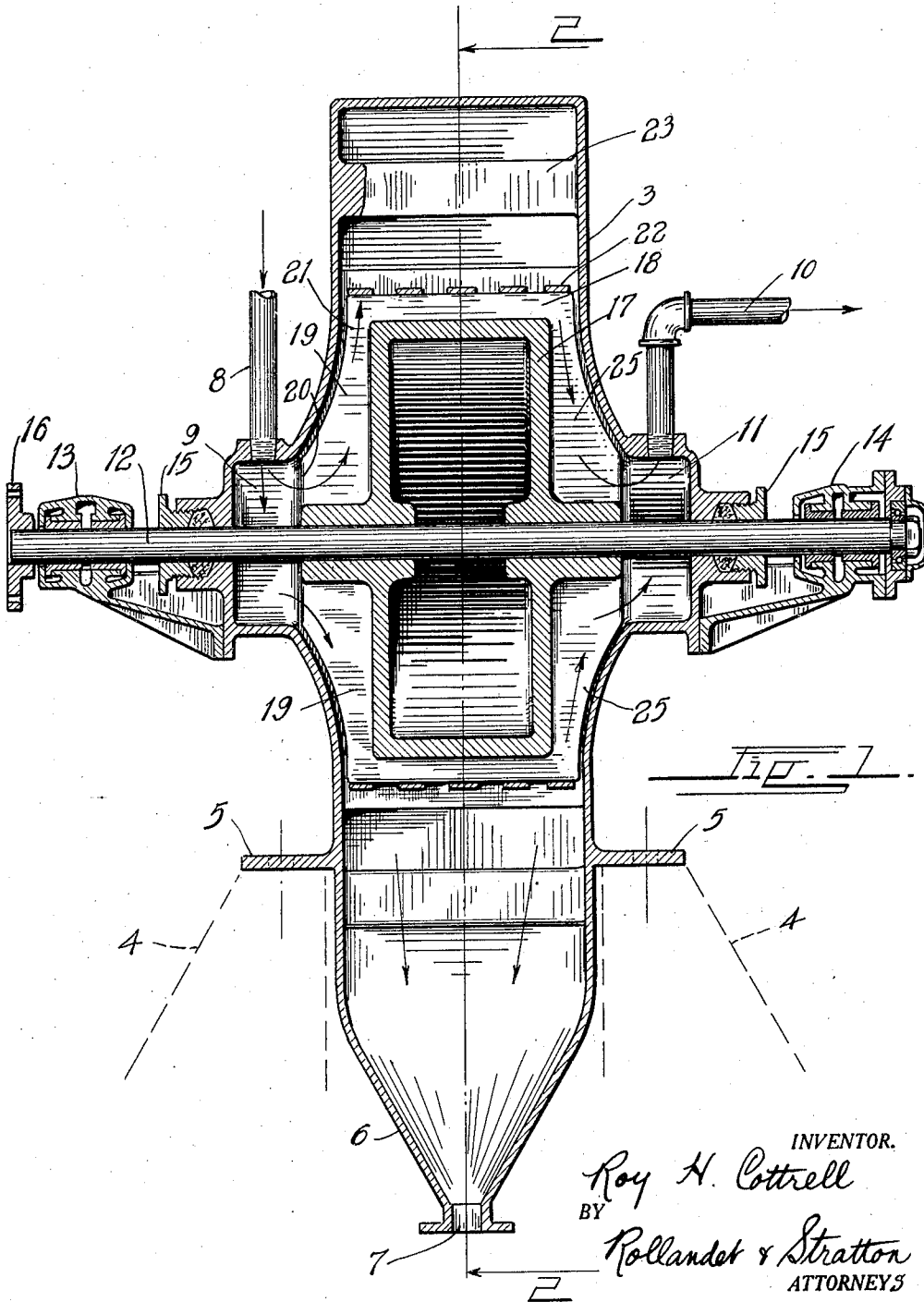
March 7, 1933.

R. H. COTTRELL
CENTRIFUGAL THICKENER

1,900,394

Filed Dec. 28, 1931

2 Sheets-Sheet 1



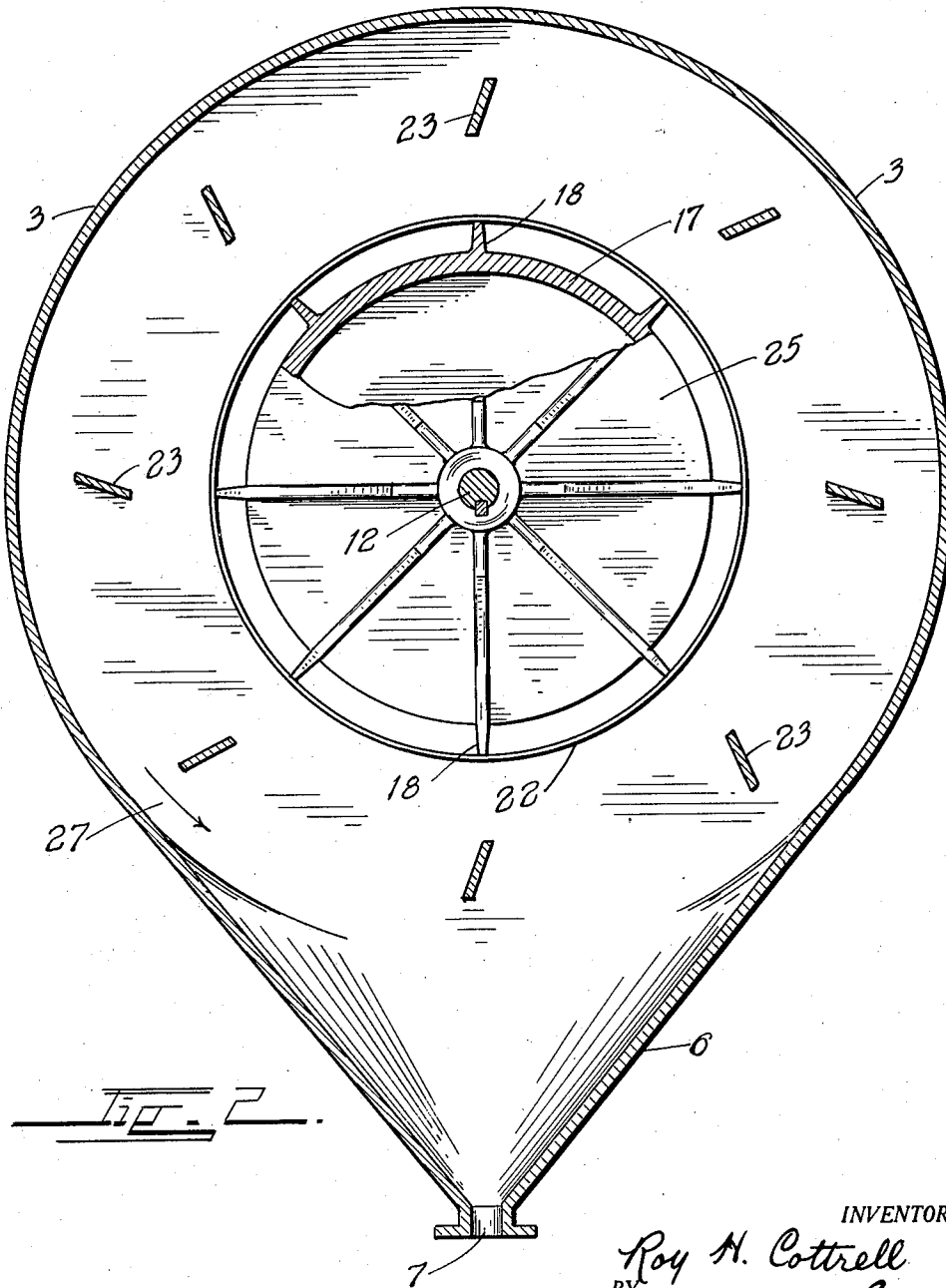
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INVENTOR.

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CENTRIFUGAL THICKENER

Application filed December 28, 1931. Serial No. 583,595.

My invention relates to centrifugal thickener. An important object of the invention is to provide means whereby the material in the thickener may have a constant velocity in its movement in a radial direction.

Other objects are to prevent turmoil in the thickener, to prevent liquid therein from following rotation of the rotor.

I carry out the foregoing and other objects that will appear in the course of the following description by a stationary housing containing a rotor having radial passages of constant cross-sectional area, by the provision of bands on the rotor, by stationary baffles in the housing around the rotor, and by other details of construction and by novel combinations and arrangements of parts hereinafter described.

In the drawings, like reference characters designate similar parts in the several views. Figure 1 is a vertical section taken through an embodiment of my invention.

Figure 2 is a section taken on the line 2—2 of Figure 1, showing the rotor in broken elevation.

Referring more in detail to the drawings, the reference numeral 3 generally designates a stationary housing mounted on supports 4 by means of flanges 5.

A sump 6 depends from the body of the housing between the supports 4. An outlet opening 7 is provided at the bottom of the sump for the escape of settled solids.

A feed pipe 8 empties feed material into a chamber 9, connecting with the interior of the housing, and an outlet conduit 10 conveys away clear liquid from chamber 11, also connecting with the interior of the housing. A flow is established from pipe 8 to conduit 10.

Within the housing is a rotor mounted on a shaft 12. The shaft is mounted in bearings 13 and 14 and passes through stuffing boxes 15. The shaft carries a flanged bead 16 for attachment to a driving element. Detailed description of the bearings is believed unneces-

sary since per se they form no part of the present invention.

The rotor comprises a hollow drum 17 supported on the shaft 12. The drum carries vanes 18, which extend along the sides and circumferential edge of the drum. The vanes are progressively lower toward their outer edge of the drum to provide passages 19 and 25 of constant cross sectional area. In other words, the mouth 20 of each passage 19 has the same cross sectional area as the outlet 21 of the passage, and the cross section of the passage 19 at any point therebetween is the same. The passages 19 are at the inlet side of the drum and the passages 25 are at the outlet side of the drum. Liquid travels outward in the passages 19 and inward in the passages 25.

Bands 22 extend around the vanes, which reduce the turmoil within the housing. Stationary baffles 23 are disposed at an angle, 10% to 15% is preferable, to radii drawn from the center of the drum, as best shown in Figure 2. These baffles which are placed near the center of the annular space between the rotary drum and the housing provide a zone between the baffles and the drum and a zone between the baffles and the housing. The material is comparatively more quiet in the latter zone than in the former.

In operation feed material is fed into the housing by the pipe 8. The drum and vanes 18 are rotated with the shaft 12. The uniform area of the passages 19 and 25 reduces turbulence and provides a uniform rate of flow through the thickener from the inlet to the outlet.

The centrifugal force of the rotor causes heavier particles to be thrown outward so that they can descend in the comparatively quiet zone 27 between the stationary vanes and the housing, to the sump, whence they are discharged at the outlet 7. The clarified liquid travels through the passages 25, into the

chamber 11 and is then conveyed away by the conduit 10.

It is to be understood that changes may be made in the details of construction and arrangement of parts without departing from the spirit and scope of the invention.

What I claim and desire to secure by Letters Patent is:

1. A centrifugal thickener comprising a stationary housing, and a rotor in the housing having a radial passage of uniform cross-sectional area, the housing having an inlet and an outlet disposed to cause material to traverse said passages in passing from the inlet to the outlet.

2. A centrifugal thickener comprising a stationary housing and a rotor in the housing having a radial passage at opposite sides, the housing having an inlet and an outlet disposed to cause material to traverse said passages on both sides of the rotor, in passing from the inlet to the outlet.

3. A centrifugal thickener comprising a stationary housing, and a rotor in the housing having a radial passage of uniform cross-sectional area at opposite sides, the housing having an inlet and an outlet disposed to cause material to traverse a passage on one side of the rotor in an outward radial direction, and to traverse a passage on the opposite side in an inward radial direction, in passing from the inlet to the outlet.

4. A centrifugal thickener comprising a stationary housing, and a rotor in the housing having radial passages at the sides and at the circumference, the passages at the side having the same cross-sectional area throughout, the housing having an inlet, an outlet for settled solids and an outlet for clear liquid.

5. In a centrifugal thickener, a rotor having a passage disposed whereby material may be thrown outward therefrom by centrifugal force, the passage being the same cross-sectional area throughout.

6. A centrifugal thickener comprising a stationary housing, a rotor in the housing adapted to throw material outward by centrifugal force, the rotor being spaced from the housing, and a stationary vane in said space at an angle to a radius of the rotor disposed to provide a zone between the baffle and the rotor and a zone between the baffle and the housing.

7. A centrifugal thickener comprising a stationary housing having a sump at the bottom for settled solids, said sump being provided with an outlet, the housing having an inlet for feed material and an outlet for clear liquid, and a rotor disposed in the housing between the inlet and the outlets, the rotor having passages for throwing material outward by centrifugal force, said passages being of constant cross-sectional area throughout.

8. A centrifugal thickener comprising a housing having an inlet for feed material, an outlet for settled solids and an outlet for clear liquid, and a rotor in the housing disposed between the inlet and the outlets, the rotor having passages for throwing material outward by centrifugal force, said passages being of constant cross-sectional area throughout and being disposed whereby all material passing through the thickener traverses said passages.

In testimony whereof I hereunto affix my signature.

ROY H. COTTRELL.

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