F. R. WILLSON.

ROTARY SCREEN.

APPLICATION FILED JAN. 13, 1916. RENEWED JAN. 31, 1921.

1,370,620. Patented Mar. 8, 1921.

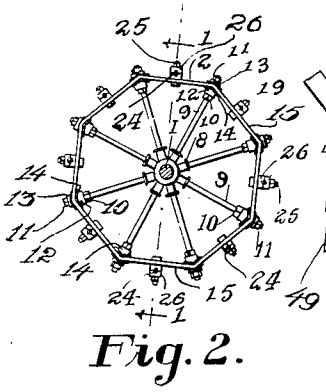


Fig. 2.

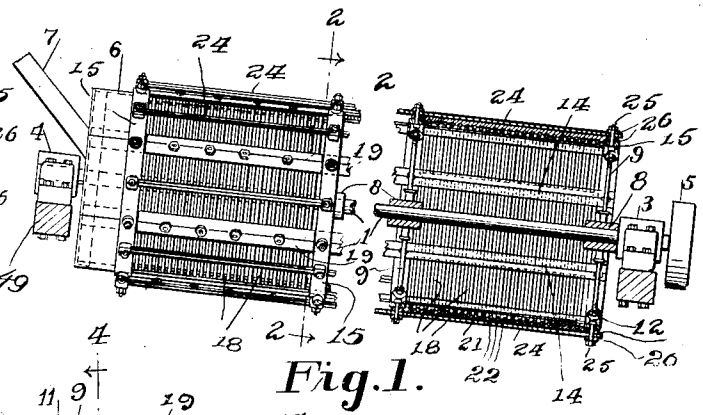


Fig. 1.

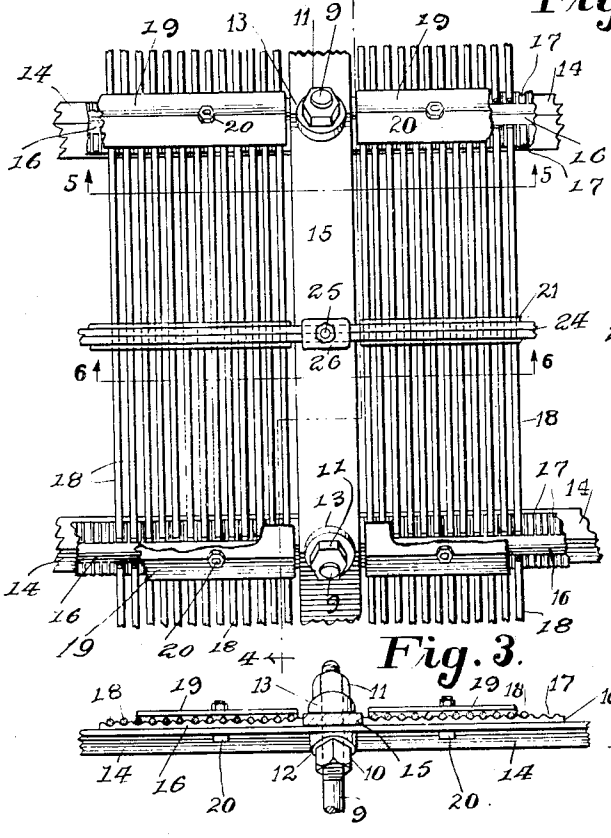


Fig. 3.

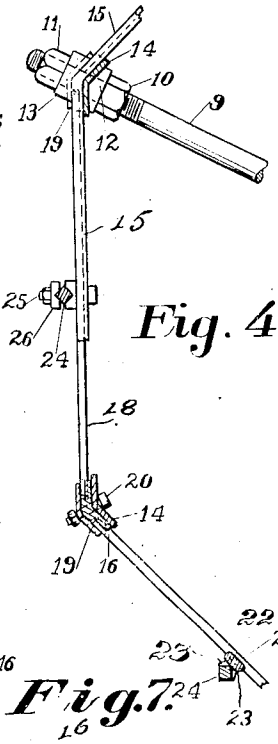


Fig. 4.

Fig. 5.

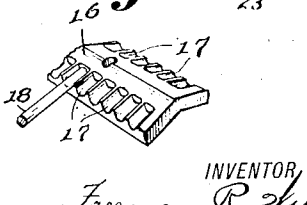


Fig. 7.

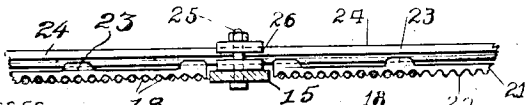


Fig. 6.

WITNESSES

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ROTARY SCREEN.

1,370,620. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed January 13, 1916, Serial No. 71,888. Renewed January 31, 1921. Serial No. 441,458.

To all whom it may concern:

Be it known that I, FREEMAN R. WILLSON, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Rotary Screens, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in revolving screens, and particularly to screens having the screen element formed of parallel rods, wires or bars arranged in, or approximately in, planes transverse to the axis. Heretofore mechanisms of this class have been generally made with a supporting frame and a screening element formed of fabric produced by interweaving or interlacing wire of one degree of fineness or another; this woven wire element either being carried as an integral sheet entirely around the axis and stretched upon its frame or being cut into sections, and the sections severally secured to the frame upon arcs or chords of a cylinder. The interweaving or interlacing of the strand wires and the mesh wires forms apertures, generally square, sometimes smaller, sometimes larger, and always surrounded by wires or rods. Many materials which are delivered to the screen are of such nature that particles or masses lodge in these apertures and clog them because of their adhering to, or being caught between, the cross wires or rods.

Again, when abrasive materials are being treated in the screens, the wire mesh sections rapidly wear away and renewed screen devices are required. If the rods or wires are interwoven or interlaced, relatively large sections must be taken out and others substituted.

My object is to provide a screen which will have no obstructions along lines approximately parallel to the axis, and will permit an easy and uninterrupted flow or sliding along lines around the periphery; and which will have the screen elements, proper, formed in short rod or wire sections which can be individually removed or inserted in the case of wear, breaking or bending. I at present prefer to embody my improvements in screen structures which are polygonal in cross section, but many of the features of novelty can also be utilized in making those which have the wires or rods arranged in such way as to conform to the surface of a cylinder.

In the drawings,

Figure 1 illustrates a cylinder embodying my improvements, one end part being shown in side elevation, the other end part in vertical section, and the intermediate parts being broken away;

Fig. 2 is a cross section on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation of a portion of the screen showing the parts on a larger scale;

Fig. 4 is a section along the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 is a section on the line 6—6 of Fig. 3;

Fig. 7 is a perspective of a part of a saddle bar.

1 indicates a shaft upon which is supported the screen, indicated as an entirety by 2. The shaft is mounted in bearings 3 and 4 and is provided with a power receiving pulley 5. The bearing 4 is somewhat higher than that at 3 and consequently the shaft and the screen are inclined from the receiving end to the discharge end to cause the material to gradually move downward toward the discharge as it is carried around by the screen. 6 indicates a receiving chamber having a cylindrical or polygonal peripheral wall and an end closed sufficiently to retain the material initially fed to the screen through the chute or spout 7.

8, 8 are hubs secured to the shaft 1 and having socketed radially arranged projections. 9, 9 are radially arranged arms the inner ends of which are respectively seated in the sockets, and the outer ends of which are connected to the longitudinal bars 14 of the frame, each arm having a nut 10 on the inside and a nut 11 on the outside of a longitudinal bar. Each bar 14 is angled or bent from a central longitudinal line to correspond with the angle of each section of the screen to that of its neighbor. 12 and 13 are washers each with a face beveled or angled to correspond with the angle of the bar 14. 15, 15 indicate bands or frame sections, each arranged transversely to the screen axis, each part of the band being at an angle to the next part corresponding to the angle above referred to, so that the

bands can rest upon and be tightly clamped against the outer surfaces of the longitudinal bars 14. The radial frame arms 9 pass through these band elements also, and are clamped in place by the washers 12 and 13 and the nuts 10 and 11.

The parts above specified furnish a strong, rigid and durable skeleton frame upon which the parts are supported that constitute the screen, proper. Of the transverse bands 15, there may be as many as the length of the screen demands.

16, 16 represent bars (which I shall refer to as saddle bars or blocks), preferably cast in the way shown, that is to say, with one-half angled as to the other half and having parallel recesses 17 formed along each of the outer faces. These bars or blocks can be fitted tightly to the angle bars 14 each bar section 16 extending from one of the transverse bands 15 to the other.

18, 18 are bars, rods or wires which constitute the screen elements, proper. They are formed or cut in sections of equal lengths. Each lies in a plane transverse to the axis and extends from the saddle block 16 on one of the bars 14 to that on the next bar having each of its ends seated in one of the recesses 17. All of the adjacent ends of the bars of a row constituting a section of the screen are held in place by a clamp bar 19, each of which corresponds to a saddle bar or block 16 except that its recesses are formed in its under or inner surfaces. After the rods of a row have been put in place in the recesses the clamps 19 are locked securely in place by bolts 20 which pass through the clamp bars, the saddle blocks and the main angle bars 14. If it is desired to make the screens large in diameter without increasing the number of the longitudinal bars 14, that is, without increasing the number of peripheral sections, or if it be desired to employ relatively fine, and therefore weaker, rods or wires 18; that is to say, if, from any cause, these elements 18 are found to be too long for the load of material placed upon them, and they tend to sag or bend or be thrown out of parallelism, intermediate bracing devices can be used. 21 indicates a supplemental saddle bar preferably cast and having rod-holding seats between transverse ribs 22 corresponding in number and size to the rods or wires 18. Each is formed with lugs or projections 23 at suitable intervals, longitudinally. 24 is a longitudinally arranged bar which may extend from end to end of the screen. It is preferably square in cross section and is arranged to lie in the seats furnished by the lugs 23 and hold the saddle bars 21 in place. It occupies lines outside of the transverse bands 15, and is clamped to each of them by a recessed block and washer at 26 and a bolt 25.

It will be seen that the interior surface of the screen proper is practically unobstructed as concerns lines in planes transverse to the axis, the only interruptions being the thin frame bars 14, the screen rods or wires 18 extending practically across an entire section of the surface without obstruction. When the supplemental brace devices are used, shown at 21 and 24, there are no projections extending to the interior of the screen surface, the longitudinal surfaces of the screen rods being exposed on the interior virtually throughout their entire length. Consequently there is no clogging or stoppage of the material in the passages or apertures through the screen.

As hereinbefore noted, when materials are screened which are highly abrasive, the metal parts forming the screen surface are rapidly worn away. When that occurs with the mechanism here shown, it is merely necessary to loosen the clamping devices and remove the rod or rods which are worn and substitute new ones. This avoids the labor involved in dismantling and rebuilding the structure, and obviates the loss of an extensive part of it in case repair is necessary.

It will be seen that the operative surface of the screen (I thereby meaning the entire number of the screen rods and their outermost holding devices), is composed of a series of rows of detachable rods, the term "row" referring to those which lie in substantially a common plane parallel to the axis of the screen, although each lies in a plane that is transverse to the screen's axis, there being, in the construction shown, eight of these rows in a series extending continuously around the axis. The rods may also be regarded as being arranged in a row of "sets" with eight in each set, all lying in substantially the same plane transverse to the axis. Again, it will be noticed that each of the rows is composed of sections, there being a large number of screen rods in each section, and each section extending from one of the brace bands or rings 15 to the next.

What I claim is:

1. In a rotary screen, the combination with a rigid frame comprising an axial shaft, a plurality of sets of radial members on the shaft and a series of bars extending longitudinally of the screen and secured to the outer ends of the radial members, said bars being thin and having their width extending circumferentially of the screen, of screen rods disposed in planes transverse to the screen axis and arranged in a plurality of series extending longitudinally of the screen with the abutting rod ends of each series resting on the outer sides of the said longitudinal frame bars, means on the outer sides of said screen bars for detachably securing the ends of the screen rods thereto, and means for bracing the screen rods in-

termediate their ends comprising bars extending longitudinally of the screen on the outer sides of the screen rods.

2. In a rotary screen, the combination with a rigid frame comprising an axial shaft, a plurality of sets of radial members on the shaft and a series of bars extending longitudinally of the screen and secured to the outer ends of the radial members, said bars being thin and having their width extending circumferentially of the screen, of rod spacing means secured on the outsides of said longitudinal frame bars, screen rods disposed in planes transverse to the screen axis and arranged in a plurality of series extending longitudinally of the screen with the ends of each rod engaging spacing members, and longitudinally extending clamping bars for rigidly connecting the ends of the screen bars and the spacing means.

3. In a rotary screen, the combination with a rigid frame comprising an axial shaft, a plurality of sets of radial members on the shaft and a series of bars extending longitudinally of the screen and secured to the outer ends of the radial members, said bars being thin and having their width extending circumferentially of the screen and formed with recesses for the reception of screen rods, of screen rods disposed in planes transverse to the screen axis and arranged in a plurality of series extending longitudinally of the screen with the abutting rod ends of each series resting in said recesses on the outer sides of the said longitudinal frame bars, and means on the outer sides of said screen bars for detachably securing the ends of the screen rods thereto.

4. In a rotary screen, the combination of a frame comprising radial members adapted to be mounted on a rotary shaft, longitudinal members carried by said radial members and having on their outer sides two series of recesses, each recess extending in a peripheral direction and the recesses at one side of the bar being arranged at an angle to the recesses at the other side of said bar, screening rods seated in said recesses and extending in a direction peripherally of the screen, and means for securing said rods in said recesses, said longitudinal members having in line with their recesses abutting means for said rods.

5. In a rotary screen, the combination of a frame comprising radial members adapted to be mounted on a rotary shaft, longitudinal members carried by said radial members and having on their outer sides recesses extending in a peripheral direction, screening rods seated in said recesses and extending in a direction peripherally of the screen, means for securing said rods in said recesses, and transverse bands arranged at intervals between the screen rods and extending around the screen and attached to the outer sides of said longitudinal bars.

In testimony whereof, I affix my signature, in presence of two witnesses.

FREEMAN R. WILLSON.

Witnesses:
HARRY C. DEAN,
DUDLEY T. FISHER.