

J. DONGES.
SCREENING MECHANISM.
APPLICATION FILED NOV. 16, 1911.

1,025,791.

Patented May 7, 1912.

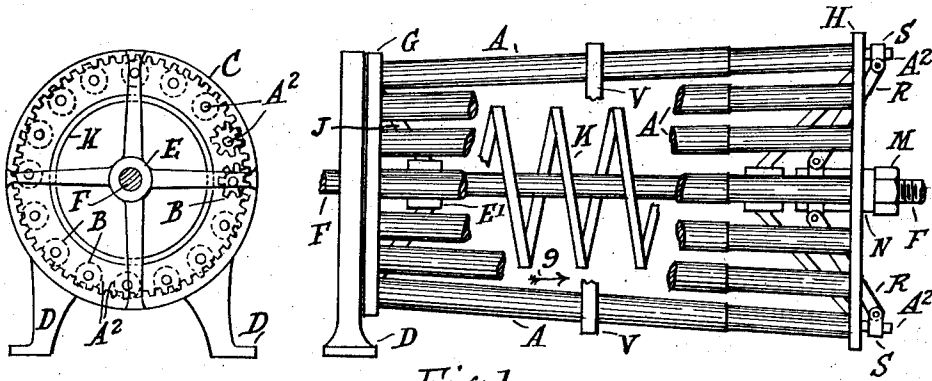


Fig. 2.

Fig. 1

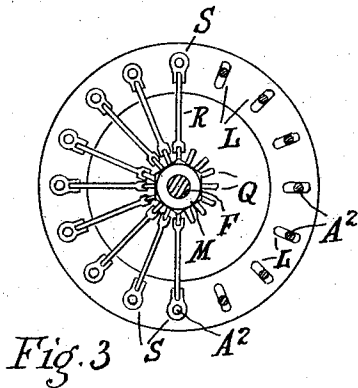


Fig. 3

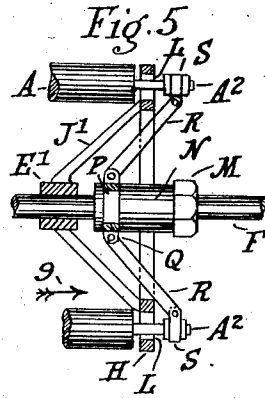


Fig. 5

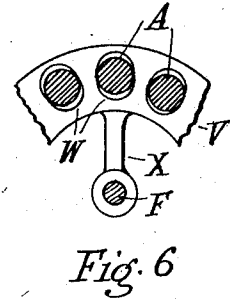


Fig. 6

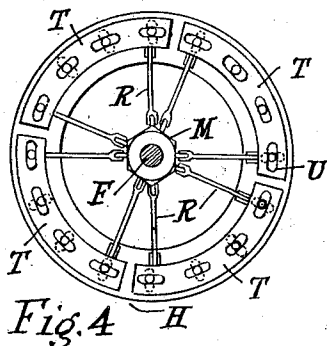


Fig. 4

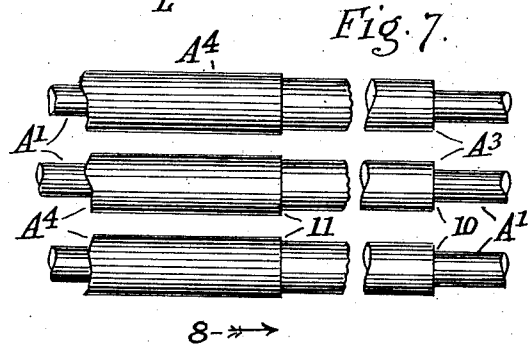


Fig. 7.

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UNITED STATES PATENT OFFICE.

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SCREENING MECHANISM.

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To all whom it may concern:

Be it known that I, JACOB DONGES, a subject of the King of Great Britain and Ireland, &c., residing at Drayton, in the State of Queensland, Commonwealth of Australia, have invented certain new and useful Improvements in Screening Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to screens or sieves of the type in which the matter to be treated is received and conveyed within, and screened by means of a longitudinally extending chamber of somewhat cylindrical form.

In threshing and harvesting machines and so forth, it is necessary to separate some material, as grain from the straw, and it is advantageous to grade the grain at the same time.

My invention is usable as a grading screen, but it has other applications, as in the grading or separating of mineral matters, and so forth.

In my construction a plurality of longitudinal rods or rollers are arranged around an axis to form the screening chamber, which is provided with means for varying its shape as from a cylindrical form to one or other of various tapering or enlarging forms. My rods are stepped, and are arranged so that during screening each roller turns on its own axis, and rotates around the axis of the chamber which rotates as a whole; matter fed into the screen becomes so tumbled about by these roller actions as to facilitate the desired screening. The gaps between the rollers are for the passage of grain or any matter which is to be separated from the rest. The width of each gap is capable of being specially varied by the user of the machine, as by its being increased from end to end but to a greater extent at the discharge end of the chamber. Each gap is left narrow at the receiving end, and widens toward the discharge end, but these gaps are at will set to have parallel sides, or nearly parallel ones; or the rollers and thus the gaps are stepped. The said details and others are illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of various parts showing the screening chamber with a

portion broken out to exhibit an internal screw conveyer. Fig. 2 is a front elevation of the screen, means for rotating the rollers or rods being shown; and Fig. 3 is an elevation of parts at the rear end of the screen showing means for varying the widths of gaps between the rollers. Fig. 4 is a rear elevation showing modified means for varying roller gap widths. Fig. 5 is a side elevation (partly sectional) of parts in Fig. 3; Fig. 6 shows some details in transverse section, and Fig. 7 shows stepped rollers.

Material to be screened is fed into the front end of the chamber, and is conveyed in the direction of arrow 8 in Fig. 7, and arrow 9 in Figs. 1 and 3. In these drawings some parts are omitted or broken away to show other parts clearly.

Any suitable device not shown or claimed is used to feed the material to the chamber.

In Fig. 1 for clearer illustration gaps between the rollers are shown specially wide, and only some rollers are shown.

I provide a series of comparatively small rods and rollers A and A¹ each having its spindle or axle A² fitted at its front end with a cog wheel B which meshes with an internal spur gear wheel C which is fixed, and has any suitable support as a framing, which may have feet D. The hub E of wheel C provides or carries a bearing for a screen axle or shaft F, which has any suitable additional rear supporting means not shown.

E¹ are collars fixed suitably on shaft F, and having spokes J, J¹ to rings G, H, as at the front and rear, each ring having a series of apertures or slots L (see Fig. 5) to receive the spindles A² or the like of the said rollers. These apertures or slots allow the spindles some play in ring G, and still more play in ring H because the movement of the spindles will be greater at the rear end.

Shaft F is to be rotated by any suitable means not shown. It carries a conveying means of any suitable size and detail, as a spiral member K within the chamber, adapted to rotate with the said shaft and advance the material to be treated along the screen, allowing such as is sufficiently fine to fall through the gaps. The conveyer ends may be fastened to the frame front and rear instead of to the shaft. The rollers are made to turn on their respective axles the same way, for example clockwise, and thus I

avoid crushing of the material between adjacent rollers, though it is subjected to useful lifting, turning and falling influences, and material which should fall through the gaps is prevented from massing objectionably and sliding onward unscreened. The slots L extend radially as in Fig. 3 and permit the spindles A^2 in them to be moved toward or from the chamber axis, that movement varying the gap widths. On shaft F is a nut or part M which on being rotated on a screw threaded part F^1 of the shaft, or adjusted along the latter, pushes or pulls a sleeve or connecting means N which abuts on or has an end ring or part P, having a series of lugs or members Q to which are pivoted or movably attached a series of toggles R, pivoted to rings or clips S fitted loosely around spindles A^2 or the like. When nut M is advanced inwardly on shaft F, ribs R close and draw spindles A^2 and thus rollers A toward the axis or shaft F thus narrowing the roller gaps but mostly at the rear end of the screen. Conversely when part M is moved outwardly, the gaps are widely but mostly at the said rear end.

The drawings illustrate the action, but I do not limit the construction as to proportions, sizes of parts or minor details. In practice the rear slots L may for example be longer in proportion than as illustrated. A separate rib R as in Fig. 3 may be used for each roller, or—see Fig. 4—plates or arcs T are provided, each supported by one or more ribs R, two being shown to each plate. Each plate has arc shaped or suitable slots U to receive spindles A^2 or suitable parts of the rollers. The latter also pass through slots L, shown dotted in Fig. 4. When plates T are drawn toward shaft F by the action already described, the rollers move correspondingly. It will now be seen that rollers A have an adjustability somewhat like the adjustability of the ribs of an umbrella, but different in degree, detail, and purpose. Each roller is in some cases, at one or more points of the chamber, for example midway, supported as by a ring V (see Fig. 6) having radial slots W to permit of the outward and inward movements of the rollers. The ring is supported suitably, as by arms on a collar on shaft F, one arm X being shown.

Material fed into the screen front is carried along by the conveyer. The finest grain or material falls or is pushed by roller action through the gaps where they are narrowest; then material of larger gage falls through farther along,—and the largest grain or coarsest material last. Any residue is conveyed through the chamber rear to be dealt with in any manner desired by means which form no part of my invention. By using special rollers as to diameter and surface contour, desired effects on

the material will be obtained. The rollers treat the material in fact as predetermined, by turning it over and gripping it more or less, and so on according to the roller shapes, and the nature of the material.

The gap widths increase in Fig. 7 by reason of one or more steps, as at 10 and 11, in the rollers which are each either integral or are built up as by means of one or a series of sleeves on a spindle. Steps 10, 11 have either square or rounded shoulders. Sleeves of simple form are shown marked A^3 , A^4 on a spindle A^1 . In this construction the grading is regulated by the steps and by the adjustment of each spindle provided for as explained with reference to (for example) spindles A^2 , Fig. 5.

Various details of the construction can be modified while retaining matter which is claimed.

What I claim as my invention is:—

1. In a screening apparatus, the combination of a suitable support; a shaft mounted thereon; a plurality of spaced bars disposed radially of and mounted on said shaft; a pinion secured to each of said bars; a gear wheel mounted on said shaft and meshing with all of said pinions and adapted to rotate the same in one direction; and means connected with said bars at their respective ends for adjusting said bars radially whereby to change the spaces between said bars, substantially as described.

2. In a screening or separating apparatus, the combination of a suitable support; a shaft mounted thereon; a plurality of spaced bars disposed radially of said shaft; devices for mounting said bars on said shaft at either end thereof, comprising a pair of toggles for each bar; a ring disposed at either end of the shaft and provided with radially disposed slots for receiving the ends of said bars; and means for moving said toggle members to adjust the respective ends of said bars whereby to change the spaces therebetween, substantially as described.

3. In a screening or separating apparatus, the combination of a suitable support; a shaft mounted thereon; a plurality of spaced bars disposed radially of said shaft; and providing the separating or screening chamber; devices for mounting said bars on said shaft disposed at either end thereof, said devices comprising each a member slidable on the shaft, and toggles connecting said members with the respective ends of each shaft; and means for shifting said slidable members whereby to adjust the respective ends of the several bars for changing the spaces therebetween, substantially as described.

4. In a screening or separating apparatus, the combination of a suitable support; a shaft mounted thereon; a plurality of spaced bars disposed radially of said shaft; devices

for mounting said bars on said shaft, comprising slidable members disposed at either end of the shaft, and toggles connecting said slidable members with the respective
5 ends of each bar; said slidable members and toggles disposed to bring said bars into close relation at one end but in relatively wider relation at the opposite end thereof; and means for shifting said slidable members
10 whereby to effect variation in the spaces between said bars, substantially as described.

5. In a screening or separating apparatus, the combination of a suitable support; a shaft mounted thereon; a plurality of spaced
15 bars disposed radially of said shaft; devices for adjustably mounting said bars on said shaft, comprising a pair of slidable members, and toggles connecting the slid-

able members with the respective ends of each bar; a pair of plates mounted at either
20 end of said shaft and provided with radially disposed slots to receive the ends of said bars, and permit the adjustment thereof; means for shifting said slidable members whereby to decrease the spaces between the
25 bars at one end and to increase the spaces between the bars at the opposite end; and means for rotating said bars, substantially as described.

In witness whereof I have hereunto set
30 my hand in the presence of two witnesses.

JACOB DONGES.

Witnesses:

JOHN POOLE McLAISH,
CHRISTOPH DONGES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
Washington, D. C."