F. E. HEMINGS.

ROTARY CHIP SCREEN.

APPLICATION FILED OCT. 18, 1912.

1,182,680.

Patented May 9, 1916.

2 SHEETS—SHEET 1.

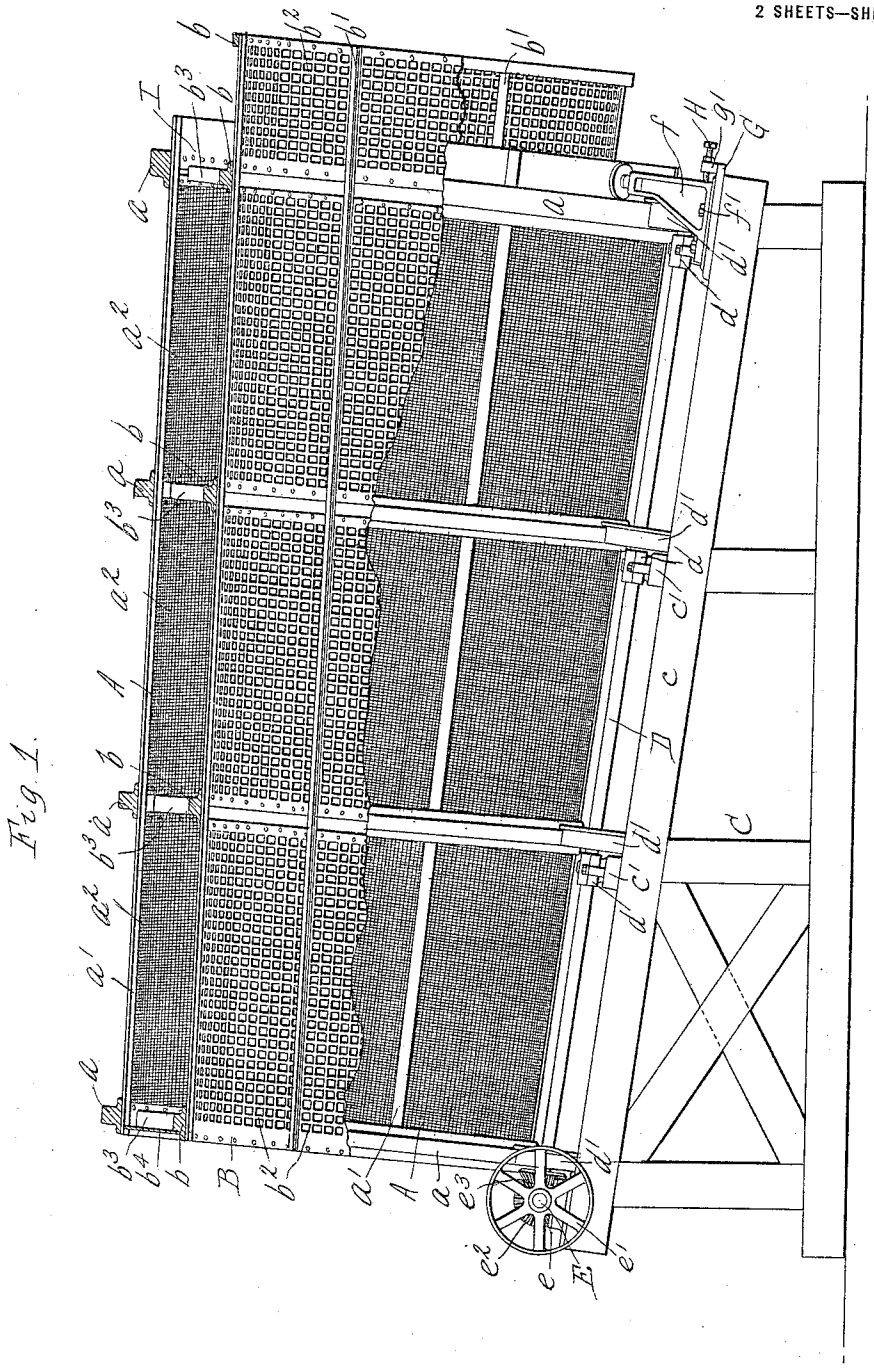


Fig. 1.

Witnesses:—
A. G. Diemond.
A. Borkenhagen.

Inventor
Frederick E. Hemings
By Wilhelm, Parker & Hard
Attorneys.

F. E. HEMINGS.

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2 SHEETS—SHEET 2.

Fig. 2.

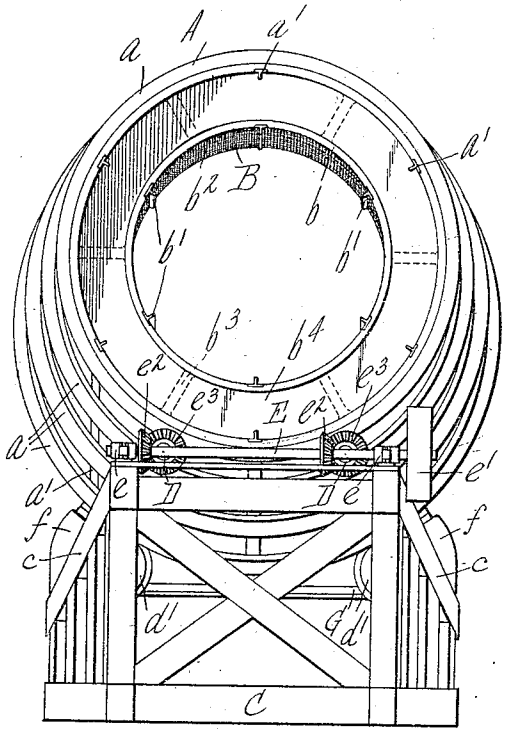


Fig. 3.

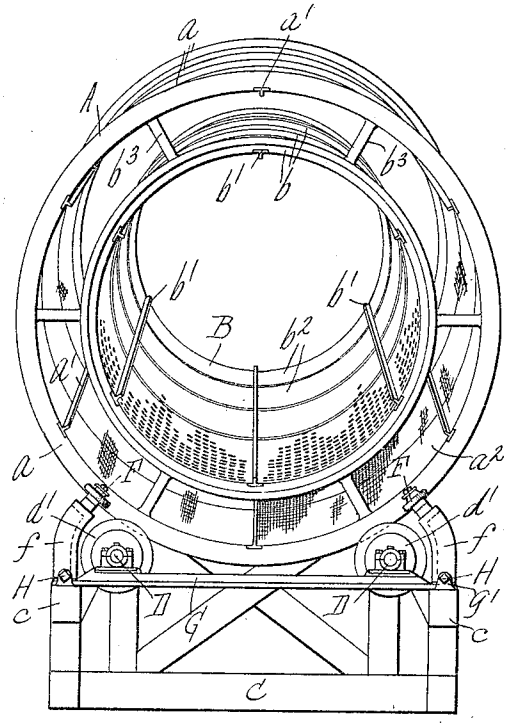


Fig. 4.

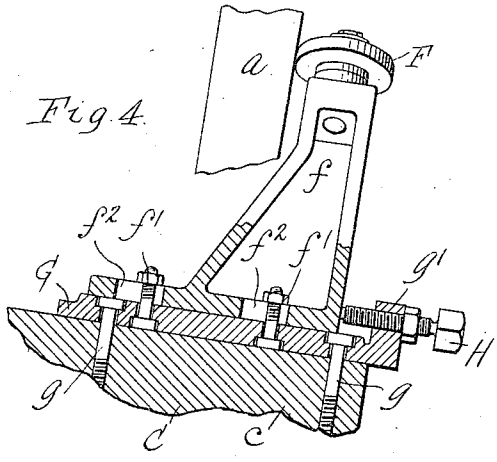
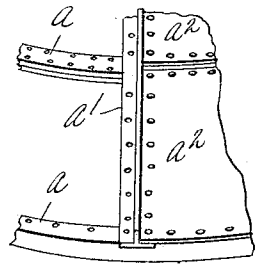


Fig. 5.



Witnesses:-
N. G. Dimond.
A. Borkenhagen

Inventor
Frederick E. Hemings
by: Wilhelm Parker & Hand
Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK E. HEMINGS, OF CARTHAGE, NEW YORK, ASSIGNOR TO CARTHAGE MACHINE COMPANY, OF CARTHAGE, NEW YORK.

ROTARY CHIP-SCREEN.

1,182,680. Specification of Letters Patent. Patented May 9, 1916.

Application filed October 18, 1912. Serial No. 726,416.

To all whom it may concern:

Be it known that I, FREDERICK E. HEMINGS, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented a new and useful Improvement in Rotary Chip-Screens, of which the following is a specification.

This invention relates to rotary chip screens which are intended more particularly for use in screening wooden chips into different grades in pulp mills.

The object of this invention is to provide a screen for this purpose of simple and compact construction having a large capacity and occupying a relatively small space, and to generally improve the construction thereof in the various respects hereinafter more fully described.

In the accompanying drawings: Figure 1 is a side elevation, partly in section, of a chip screen embodying the invention. Fig. 2 is a front end elevation thereof. Fig. 3 is a rear end elevation thereof on a reduced scale. Fig. 4 is a fragmentary sectional elevation of one of the thrust bearings and its support. Fig. 5 is a fragmentary perspective view of the inner surface of the outer drum, showing some of the screen sections removed.

Like reference characters refer to like parts in the several figures.

A and B represent correspondingly shaped hollow screening drums which are preferably tapered toward one end. The drum B is of less diameter and of greater length than the drum A and is arranged within the latter with its larger end extending outwardly beyond the larger end of the drum A.

The drum A comprises a plurality of annular rings a which are arranged at the opposite ends of the drum and at intervals intermediate of its ends, the number of these rings depending upon the length of the drum. These rings are connected together by bars a', preferably formed of T-irons, which are arranged at intervals about the circumference of the drum and extend lengthwise thereof from end to end. This frame work formed by the rings a and the connecting bars a' may be covered in any suitable manner with screening material of any desired mesh. In the construction shown, the covering consists of a plurality of separate sections a^2 of wire screening cloth. Each section is of sufficient size to cover the space on the circumference of the drum between two adjacent rings and two adjacent connecting bars and is secured at its ends to the adjacent rings and at its opposite side edges to the adjacent connecting bars by rivets or other suitable means.

The inner screening drum B is constructed in like manner and consists of a frame-work formed of rings b and longitudinal connecting rods b' covered by sections b^2 of screening material arranged and secured thereto in the same manner as the sections on the drum A, as shown in Fig. 5. The screening material for the inner drum is of larger mesh than that employed for the outer drum and, in the construction shown, the sections b^2 are perforated metal plates which afford larger openings than the wire screening cloth used on the outer drum. All of the rings b except the one at that end of the drum B which projects beyond the end of the drum A, are arranged directly beneath, and connected with the rings a by radial spacing arms b^3 which, in the construction shown, are formed integral with the rings which they connect, each set of outer and inner rings with their spacing arms being preferably cast together in one piece. The space between the outer and inner drums at their upper or feeding end is closed by an annular plate b^4 which prevents the material which is to be screened from being fed into this space between the drums.

In both the outer and inner drums the T-irons a' and b' which connect the rings are so arranged that one flange thereof will project inwardly beyond the inner surface of the screen, the edges of the adjacent screen sections being secured to the other two flanges. These inwardly projecting flanges form longitudinally extending obstructions on the inner face of each screen over which the material must pass as the screens revolve. These flanges thus tend to distribute the material longitudinally of the screen and also cause the material to turn over or change its position on the surface of the screens as it passes over them so that it will the more

readily pass through the screens, thereby increasing the efficiency and capacity of the drums.

The drums are rotatably mounted in an inclined position with their larger ends lowermost and for this purpose a supporting frame C of any suitable construction may be employed. The supporting frame shown has opposite inclined side rails *c* which are connected at intervals by cross pieces *c'*. Adjacent to these side rails, at each side of the frame are arranged shafts D which are journaled in suitable bearings *d* on the cross pieces *c'*. These shafts are inclined with the frame and converge toward each other at their upper ends in accordance with the taper of the screening drums. Both shafts are provided at intervals with opposite trunnions *d'* upon which the rings *a* of the drum A rest.

Any suitable means may be employed for rotating the drums. In the construction shown, a cross shaft E is suitably journaled in bearings *e* at the upper end of the frame. This shaft is provided at one end with a drive pulley *e'* and intermediate of its ends with beveled gears e^2 which engage correspondingly shaped gears e^3 on the upper ends of the shafts D. The shafts with their trunnions can thus be driven in unison and the drums rotated.

To reduce friction and relieve the trunnions from the end thrust of the drums, separate thrust bearings are employed which consist of thrust wheels F which are oppositely disposed at the lower end of the frame and engage the outer edge of the end ring *a* of the drum A at its lower end. These thrust wheels are journaled on brackets or other suitable supports *f* which may be constructed and secured to the frame in any desired manner. In the construction shown, these supporting brackets are secured to the frame so that they can be adjusted endwise thereof and for this purpose each bracket is secured at its base by bolts *f'* to a plate G which extends across the frame at its lower end. The heads of the bolts *f'* are secured in this plate and the base of the bracket is provided with slots f^2 extending lengthwise of the frame through which these bolts extend, the nuts on the ends of the bolts serving to secure the brackets to the plate G. The slots f^2 permit the brackets to be adjusted on the plate lengthwise of the frame. The plate G is secured to the side rails *c* of the frame by bolts *g* or other suitable means. To facilitate the adjustment of these brackets and prevent them from shifting their position when once adjusted, the plate G is provided at its lower edge opposite each bracket with upwardly projecting lugs *g'* having screw-threaded holes through which extend adjusting screws H which bear at their inner ends against the lower edge of the brackets. By loosening the nuts on the bolts *f'* and turning these screws H the brackets can be adjusted lengthwise of the frame so that all of the end thrust of the drums will be taken from the trunnions and will fall upon the thrust wheels F.

The drum A is provided at its lower or discharge end with an annular plate I which is secured to the end ring of the drum and projects outwardly beyond the thrust wheels F so that the tailings from this drum will be carried downwardly beyond these wheels.

The wood chips or other material to be screened is fed into the interior of the drum B at its upper end by any suitable means (not shown) and as the material passes along down this drum the smaller particles will pass through the same upon the inner screening face of the drum A where it will be again screened, the smaller particles passing through the screening cloth and the larger particles tailing off at the lower end of this drum. Three grades of material are thus produced, that which is too large to pass through the meshes in the inner drum and hence tails off at its lower end, that which tails off from the lower end of the outer drum, and that which passes through the screens of the outer drum.

The construction is simple and compact. The arrangement of one screening drum within the other enables the material to be twice screened without materially increasing the length of the apparatus. The interior of the inner drum is open and not obstructed by any central shaft or other parts which would interfere with the feeding of the material thereto and the progress of the same through the drum. The end thrust wheels relieve the trunnions from the strain and friction which would otherwise result from the end thrust of the drums and the adjustment for these wheels enables them to be adjusted to take up wear and relieve the trunnions from the end thrust of the drums. The separate screening sections which are employed for covering the frame-work of both drums permit breaks in any of the screens to be easily repaired as it is only necessary to substitute a new section for the one in which the break occurs without disturbing the remainder of the screen.

I claim as my invention:

A rotary screen comprising two hollow screening drums arranged one within the other, each drum having a plurality of rings extending about the circumference thereof at intervals throughout the length of the drums, arms rigidly connecting corresponding rings on the inner and outer drums, longitudinally extending members of substantially T-shaped cross section secured at intervals to and connecting said rings and arranged with their web portions extending into said drums, said rings and longitudinal

members forming a plurality of segmental spaces on the peripheries of said drums, a plurality of sections of screening material removably secured at their edges to said rings and to the flanges of said longitudinal members, trunnions on which said screen is mounted and which engage the rings of said outer drum, and means for rotating said trunnions to cause the rotation of said screen.

Witness my hand this 11th day of October, 1912.

FREDERICK E. HEMINGS.

Witnesses:
G. M. DAVIS,
JAS. F. DOOLEY.

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