

July 26, 1938.

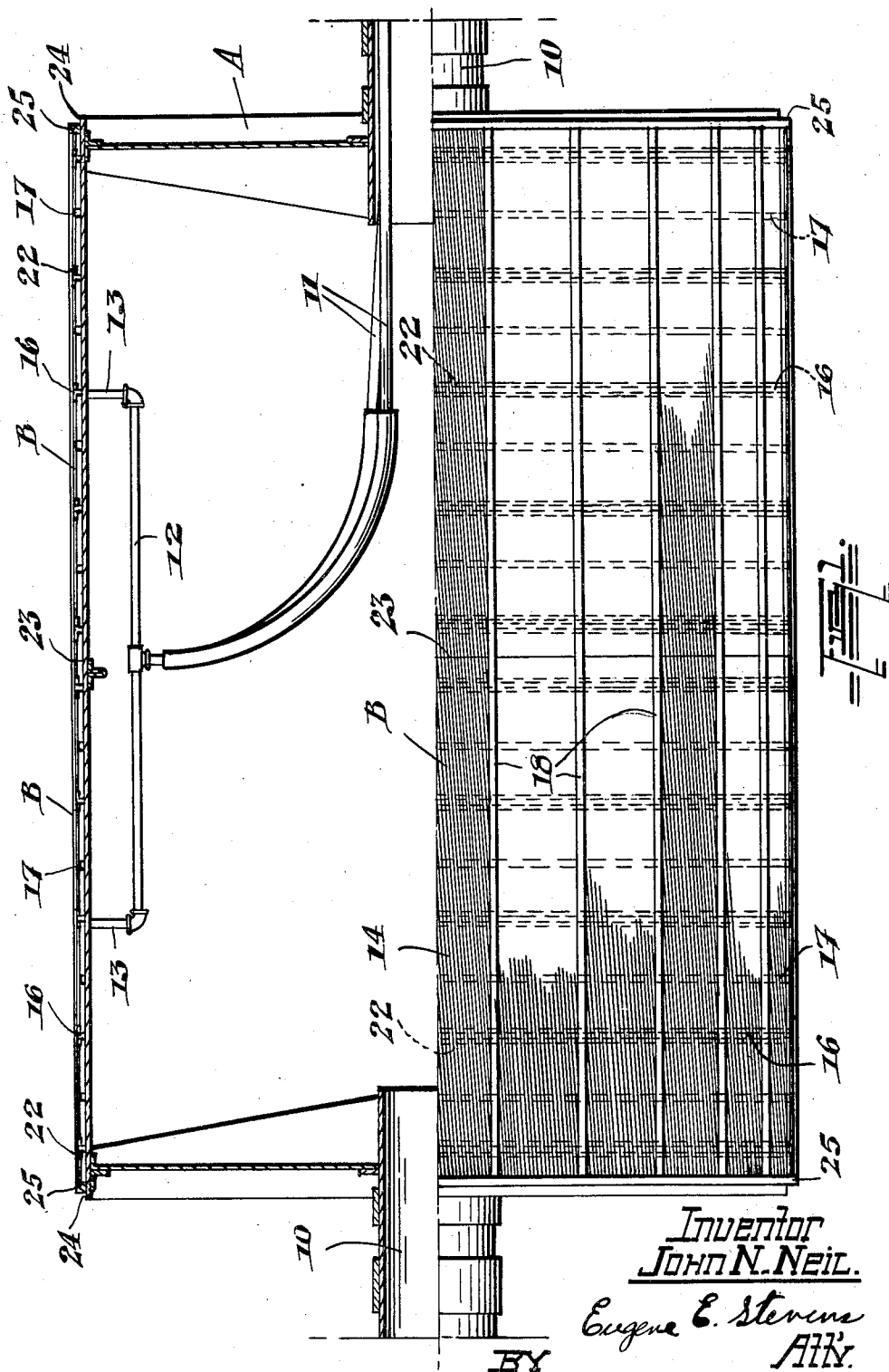
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2,124,828

DRUM FILTER

Filed Nov. 19, 1936

2 Sheets-Sheet 1



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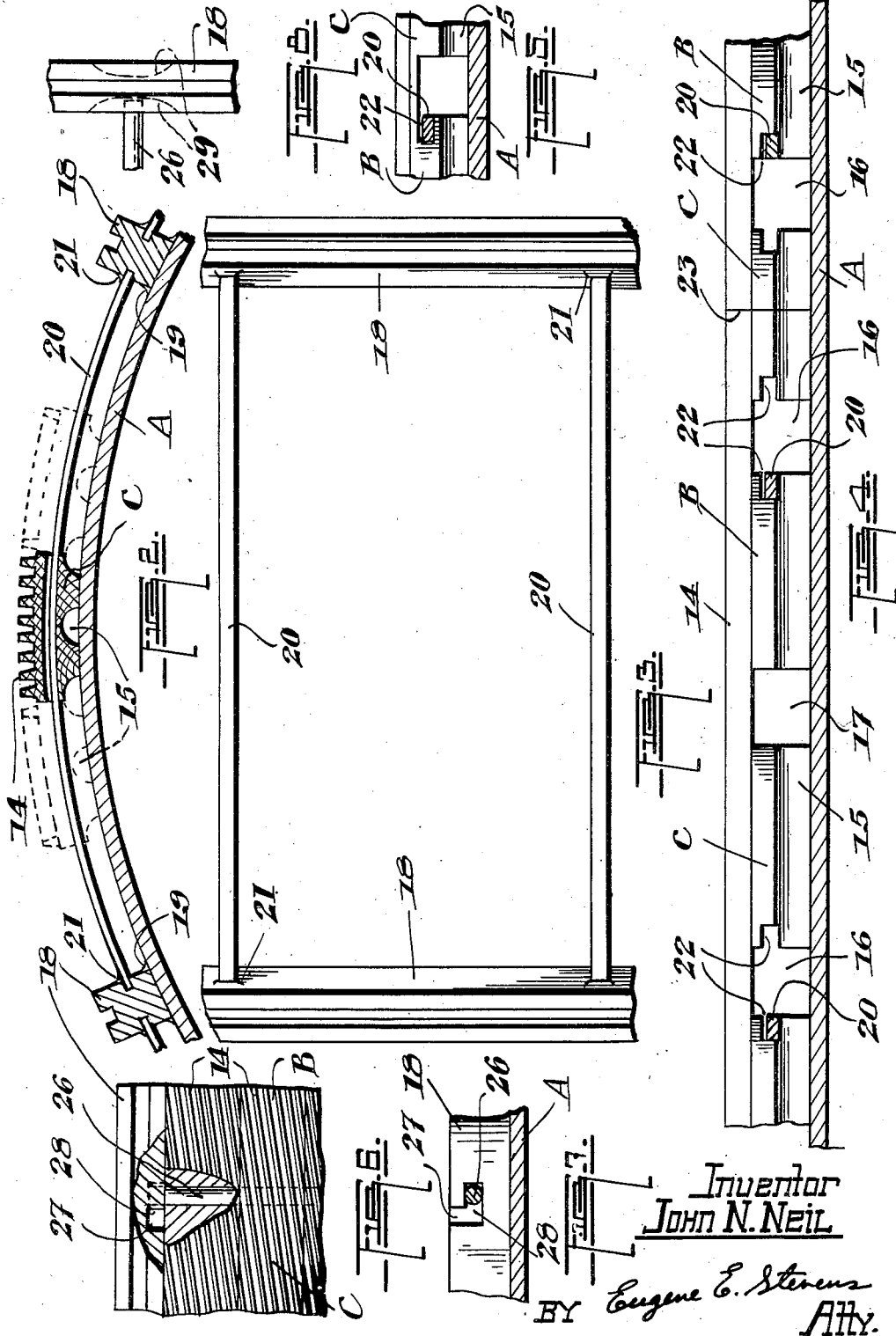
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UNITED STATES PATENT OFFICE

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DRUM FILTER

John Nicholas Neil, Sault Ste. Marie, Ontario,
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11 Claims. (Cl. 210--202)

This invention relates to drum filters for use in ore refining and more particularly to a means of fastening a wooden drainage surface on a metal drum. In fact the invention may be applied as well to the application of a removable wooden surface to a drum.

In the past wooden filter drums have been used. These had many disadvantages and subsequently a metal drum with a wire drainage surface was proposed to replace the wooden drum. However, while the metal drum had advantages over the wooden drum in respect to strength and the like, it has been found that a wooden drainage surface is very desirable. In view of this, I propose to provide a drum filter constructed of metal having a removable wooden drainage surface and have devised a novel and efficient means for detachably securing the wooden surface on the drum.

According to the invention the metallic drum is provided with a plurality of rods mounted in spaced apart relation over the drum surface and spaced from the drum surface, designed to engage with a wooden drainage covering and to hold it rigidly on said drum while providing for its removal when desired. Preferably the rods are rigidly supported on the drum by means of a plurality of protruding ribs or division strips rigidly supported on the drum but the construction may be such as to provide for detachable strips. Preferably the wooden drainage surface is applied in sections from each end of the drum, as more fully described in the following specification and illustrated in the accompanying drawings which form part of the same.

In the drawings:—

Figure 1 is a side elevation of a drum filter shown partly in section and constructed according to the present invention.

Figure 2 is an enlarged fragmentary section of a portion of the drum showing the manner in which the wooden drainage surface is secured.

Figure 3 is an enlarged fragmentary plan view of a portion of the drum showing the manner in which the securing rods are positioned.

Figure 4 is an enlarged fragmentary section taken through one side of the drum, showing the wooden drainage surface applied thereto and one manner in which it may be secured on the rods.

Figure 5 is an enlarged fragmentary section showing an alternative manner of forming the wooden drainage surface for securing it on the drum.

Figure 6 is an enlarged fragmentary plan view of an alternative manner of securing the wooden drainage surface to the drum.

Figure 7 is an enlarged fragmentary elevation partly in section of the alternative form shown in Figure 6, and

Figure 8 is a further alternative form of securing the rods on the drum.

Referring more particularly to the drawings, A indicates the drum filter as a whole which is formed of metal and is of a conventional construction. The drum is provided with the hollow trunnions 10 through which the suction pipes 11 may protrude, as shown in Figure 1, the pipes being connected in any suitable manner to the cross pipe construction 12 which communicates with the outer surface of the drum through the short conduits 13. The wooden drainage surface is generally indicated by the letter B. This is of a conventional form more particularly illustrated in Figure 2, being provided with the surface grooves 14 which are formed substantially at an angle of 4° to the longitudinal axis of the strip and being also provided with longitudinal drainage channels 15. Likewise, as clearly shown in Figure 4, they are formed with transverse drainage channels 16 and 17.

To secure this wooden drainage surface upon the drum I provide the drum with a series of longitudinally extending ribs or division strips 18 which extend substantially from one end of the drum to the other and, as shown in Figure 2, these strips are preferably secured on the drum by welding as at 19 and are spaced apart circumferentially of the drum. The division strips or ribs 18 may be of any suitable form and provide a general means in all instances of mounting the rods employed for detachably securing the drainage surface on the drum. According to the form of rod mounting shown particularly in Figures 2 and 3 the rods 20 extend between two adjacent division strips or ribs 18 and are preferably snapped into sockets formed in the division strips and welded as at 21. The rods are spaced apart from each other longitudinally of the drum and between each pair of division strips circumferentially of the drum similar rods are positioned, preferably in alignment with the rods extending between each adjacent pair of division strips so that the drum has in effect a plurality of circumferentially extending rods spaced apart over its surface and spaced from the surface. In other words, it is provided with a skeleton framework of rods extending between each adjacent rib and connected to the ribs intermediate their height.

The wooden drainage surface is preferably applied in relatively narrow sections, one of which is indicated at C in Figure 2 in full lines, and

these sections are secured on the rods and thus upon the surface of the drum by means of grooves 22 extending laterally from and intersecting the drainage channels 16, as shown in Figure 4. Opposed grooves are provided so that either groove may be used as required. Preferably the sections C are of a length substantially half the length of the drum so that a given number of sections C will cover half the area of the drum and a corresponding number will cover the other half. However, the sections may be shorter and may only cover a third or a quarter, etc. of the drum surface and equal numbers may be applied to cover the drum surface in sections.

In Figure 1 I have illustrated the sections as being substantially half the length of the drum and to apply a strip it is laid longitudinally of the drum so that the drainage channels 16 fit over the spaced rods 20 and the section may then be pushed or slid towards the centre of the drum so that the rods 20 will be engaged in a groove 22 on one side of the drainage channel, as shown in Figure 4, and as the grooves are spaced intermediate the height of the section to register with the rods 20 the section will be firmly secured on the drum surface firmly abutting the latter. When the corresponding or opposite section has been placed on the drum in a similar manner and slid towards its centre it will be secured in a corresponding manner and the ends of these sections will abut as at 23, see Figure 4. Thus, the drum surface will be covered throughout its length with the exception of a small marginal edge shown at 24 in Figure 1.

To hold the strips when they are all applied in this manner and in their shifted position a circumferentially extending securing member or strip 25 may be fastened to the drum surface at the marginal portion 24 and abutting the ends of the wooden sections. This fastener may be applied in arcuate sections. Thus once these strips are mounted the sections are firmly secured on the drum surface whereas when they are removed and the opposed sections are shifted longitudinally of the drum away from the centre they are unlocked and may be readily removed.

By forming the grooves 22 on each side of the drainage channel 16 it does not matter whether a section is placed on the right or left hand section of the drum as either groove may be used. However, if desired, the surface drainage channels 16 may be provided with only one groove located on one side of the channel, as illustrated in Figure 5. Of course other methods may be employed for securing the drainage covering on the drum. Upon referring to Figures 6 and 7 it will be seen that instead of rigidly mounting the rods on the division strips I provide a removable rod 26 which is designed to be threaded through a transverse bore or passageway 27 in the drainage sections C, the rod protruding slightly from the side of each end section and the protruding end of the rod may be inserted in a bayonet slot 28 formed in the ribs or division strips 18 so that after the rod has entered the vertical portion of the main slot the sections may be shifted towards the centre of the drum in which case the protruding ends of the rods will move in the horizontal portion of the bayonet slot thus to lock the covering firmly on the drum and by applying a similar locking or securing strip 25 on the ends of the drum as shown in Figure 1 the covering is securely held in this shifted position.

Alternatively, instead of providing a bayonet slot, the division strips may be recessed as at 29,

see Figure 8, and the rods shifted in position. In any case when the covering is mounted a series of sections extend between each pair of division strips, the end sections abutting the division strips thus to provide a complete wooden drainage covering for the drum which may be readily removed when desired or sections of which may be readily removed and replaced.

It is notable that the securing rods engage with each section at a corresponding point and as these rods extend through a portion of the wood they act as a general reinforcement to the surface thus avoiding any tendency to warp and making it impossible for one section to react differently from any other. In other words each section is provided with a common reinforcement formed by the securing rods.

Of course it will be realized that in other constructions where it is desirable to apply a wooden surface to a drum or other construction this method may be readily followed. In the main, however, I am proposing a metallic drum filter formed with a practical wooden drainage surface.

Various modifications may be made in this invention without departing from the spirit thereof or the scope of the claims, and therefore the exact forms shown are to be taken as illustrative only and not in a limiting sense, and it is desired that only such limitations shall be placed thereon as are disclosed in the prior art or are set forth in the accompanying claims.

I claim:—

1. A drum filter comprising a metallic drum, a drainage covering of wood, a plurality of rods on which the covering is fitted mounted in spaced apart relation over the drum surface and spaced from the drum surface, said covering having means to mount it and to engage it rigidly on said rods.

2. A drum filter comprising a metallic drum having a drainage covering of wood, means for securing said covering on the drum including a plurality of rods mounted in spaced apart relation over the drum surface and spaced from the drum surface, said rods engaging the covering to hold it rigidly when mounted on said drum, said covering having means slidably to engage said rods, and means to lock it on the drum surface when it is shifted in one direction and to detach it from the drum surface when it is shifted in another direction, and means mountable on said drum for preventing said covering from sliding out of locked position.

3. A drum filter comprising a metallic drum having a drainage covering of wood formed from a plurality of sections arranged in contiguous relation, and means for securing said covering on said drum including a plurality of metal rods on which the sections are fitted mounted in spaced apart relation over the drum surface and spaced from the drum surface, each section having means to mount it on said rods, said rods engaging with each section in a corresponding manner to hold them rigidly as a covering on said drum, said rods forming a reinforcement for the covering.

4. The device as claimed in claim 3 in which the sections are individually mountable and detachable.

5. A drum filter comprising a metallic drum having a drainage covering of wood, means for securing said covering on said drum including a plurality of rods mounted in spaced apart relation over the drum surface and spaced from the drum surface, said covering being formed with a plu-

5 reality of channels with laterally extending grooves intersecting said channels, said channels coinciding with said rods, said grooves being positioned to register with said rods when the covering is mounted on said drum with the rods in said channels, said covering being shiftable whereby said grooves engage said rods to hold the covering rigidly on the drum, and means mountable on said drum for preventing the covering from sliding to disengage the rods from the grooves.

10 6. The device as claimed in claim 5, in which the covering is applied in sections, there being a plurality of series of opposed sections, the ends of one series of sections abutting the ends of an opposite series of sections when said sections are shifted to engage the rods within said grooves.

15 7. The device as claimed in claim 5 in which laterally extending grooves are provided on each side of the channels.

20 8. A drum filter comprising a metallic drum having a drainage covering of wood made up of a plurality of contiguous sections, and means for securing said covering on said drum including a plurality of ribs rigidly mounted on the drum surface, a plurality of rods mounted between each pair of ribs in spaced apart relation over the drum surface and spaced from the drum surface, said sections being formed with channels positioned to register with said rods whereby said rods lie within said channels and the sections are mounted on the drum, said sections having a laterally extending groove intersecting said channels and positioned to register with said rods when the latter are positioned in said channels whereby said rods are engaged by said channels when the sections are shifted axially to lock them on the drum surface, certain of said sections abutting said ribs when in mounted position.

30 9. A drum filter comprising a metallic drum having a drainage covering of wood made up of a plurality of contiguous sections, and means for securing said covering on said drum including a

plurality of ribs rigidly mounted on the drum surface, each of said ribs having slots therein, said sections being provided with a passageway there-through, the passageway in each section being aligned with the passageway in the adjacent sections when said sections are arranged in contiguous and even relationship, metal rods traversing said passageways to hold a plurality of sections together as a unit, said rods projecting from the sides of said sections, the projecting ends of said rods being engageable in the slots of said ribs whereby said sections are locked on the surface of the drum.

10. Means for securing a wood covering on a surface comprising a plurality of wooden sections designed to form the covering, a plurality of ribs rigidly mounted on the surface, a plurality of rods spaced apart over the surface and spaced from the surface and designed to engage with said ribs, said sections being formed with channels intermediate their sides having laterally extending slots projecting therefrom, said channels being positioned in said sections to coincide with the position of said rods, said slots being positioned in the channels to register with the rods when the latter are positioned within the channels whereby, on shifting said sections, said slots are caused to engage the rods to firmly hold the sections on the surface.

11. The device as claimed in claim 10 in which the ribs are slotted and in which the sections are provided with a passageway therethrough, the passageway in each section being aligned with the passageway in the adjacent sections when said sections are arranged in contiguous and even relationship, said rods traversing said passageways to hold a plurality of sections together as a unit, said rods projecting from the sides of certain sections, the projecting end of said rods being engageable in the slots of said ribs whereby said sections are locked on the surface.

JOHN NICHOLAS NEIL.