Sept. 2, 1930. E. A. JONES 1,774,556

JORDAN ENGINE

Filed Nov. 22, 1927

Fig. 1.

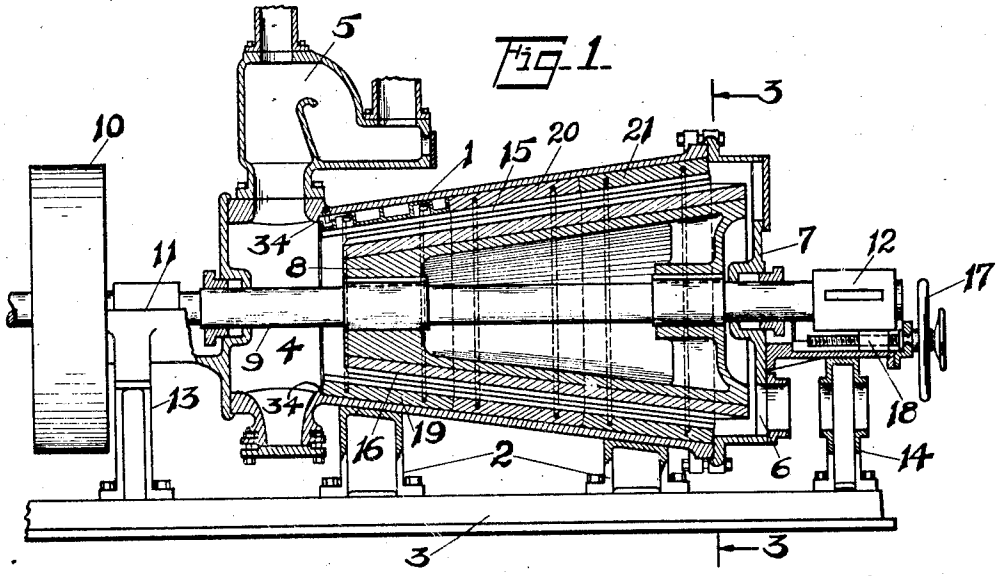


Fig. 2.

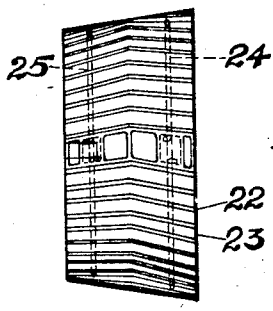


Fig. 3.

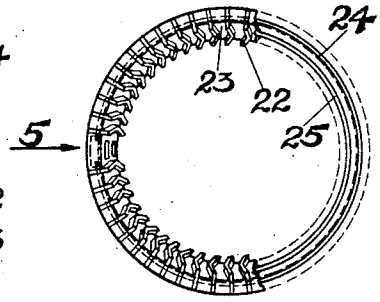


Fig. 4.

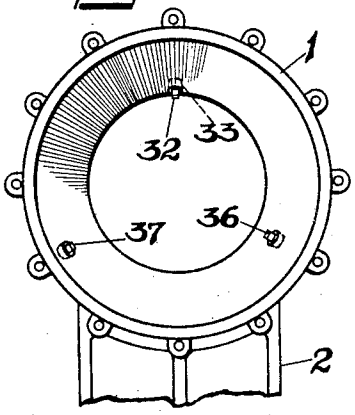


Fig. 5.

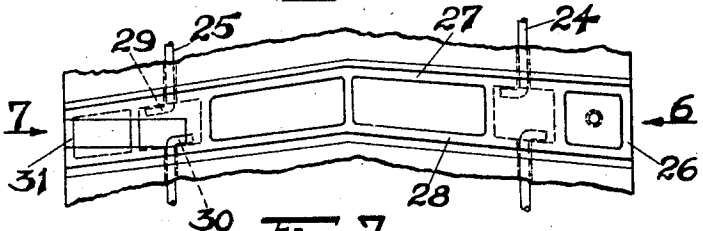


Fig. 6.

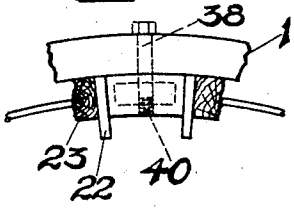
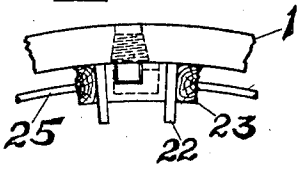


Fig. 7.



Inventor

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By his Attorneys

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Patented Sept. 2, 1930

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UNITED STATES PATENT OFFICE

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JORDAN ENGINE

Application filed November 22, 1927. Serial No. 234,947.

This invention relates to certain improvements in linings for the shell or stationary element of a refining engine of the Jordan type.

This type of refining engine includes a stationary shell and a cooperating core or plug which is mounted to rotate in the shell. The shell and plug are tapered and the stock to be refined is fed in from a suitable hopper through the small end of the shell, being discharged through the large end. The interior surface of the shell is provided with grinding elements in the form of bars, which are spaced apart and separated by strips of a suitable material, usually wood. The core or plug is also provided with cooperating grinding bars or blades separated by strips of suitable material, such as wood.

In the usual practice of filling or lining the shells of these Jordan engines, the steel bars and wood spacers are arranged sectionally lengthwise of the shell. In filling in these sections, the bars and spacers are inserted alternately and keyed in, which is slow and has other disadvantages. Furthermore, if in the operation of one of these shells one of the bars should raise up slightly, the bars in the core and shell would lock, causing serious injury to the shell filling. It has been proposed to provide a sectional filling for Jordan engines in which the bars and woods are assembled in the shop, these bars and woods being locked together by a suitable key when inserted in the shell.

It is the object of the present invention to produce a pre-erected sectional filling for Jordan engines in which the knives and bars are secured together in such a manner as to form a solid construction of the proper size to fit the Jordan shell with which it is to be used, the section being put in place by simply driving it into the shell so that the user has no parts to fit in assembling the unit with its shell.

A further object of the invention is to provide such a construction of simple form in which an improved means is provided for anchoring the parts together so as to produce this solid construction.

With these and other objects not specifically referred to in view, the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto appended.

In these drawings,—

Figure 1 is a more or less diagrammatic partly sectional elevation of a Jordan engine embodying the invention;

Figure 2 is a side view of one of the sectional units, the section shown being that for the small end of the Jordan, on an enlarged scale;

Figure 3 is an end view taken on line 3—3 of Figure 1;

Figure 4 is an end view of the shell of a Jordan engine with the lining removed;

Figure 5 is a plan view of the improved anchor plate for securely anchoring the elements together;

Figure 6 is an end view looking in the direction of arrow 6 of Figure 5, and

Figure 7 is an end view looking in the direction of arrow 7 of Figure 5.

Referring now to these drawings, the invention has been illustrated as employed in a refining engine of the Jordan type, which is conventionally illustrated. As shown, this engine includes a stationary outer shell 1 suitably supported in standards 2 rising from a floor or other suitable base 3. This shell, as shown, is tapered at its small end, opening into a feeding chamber 4 to which the stock is delievered from a hopper 5. The refined stock passes from the engine through a port 6 formed in a head 7 secured to the large end of the shell. Cooperating with this shell is a core or plug 8, this core or plug being supported on a shaft 9 driven from any suitable

source of power, indicated as a pulley 10, this shaft being supported in bearings 11, 12 in suitable standards 13, 14. The shell is provided with grinding bars or knives, indicated at 15, and the plug is provided with cooperating grinding bars, indicated at 16. As these bars wear down after the machine has been used, means are usually provided by which the plug may be adjusted endwise in the shell, so as to bring the bars in correct grinding engagement, this being accomplished by a hand-wheel 17 and the usual screw arrangement 18.

As so far described, this Jordan engine is of the usual type. My invention consists in the provision of a pre-erected filling for the shell, preferably sectional, in which the grinding bars and the spacers therebetween are so assembled as to form a solid unit which is non-expansible or contractible, and which is put in position for use in the Jordan shell by simply driving it into the shell, the unit so constructed entirely preventing the loosening of any of the bars or knives or the means by which these bars or knives are secured together. While such pre-erected filling may take various forms, in the particular construction illustrated the filling will be sectional, three sections, marked 19, 20, 21 being shown. It will be understood that such a showing is only illustrative and that the filling may consist of more or less than the three sections shown, and for the purpose of illustration, one such section has been illustrated, and the section chosen to show the invention is for the small end of the Jordan. This section is, as shown, made up of alternate steel bars 22 and spacers 23, these spacers being of any suitable material, as wood. Of course, if desired, other arrangements of the bars and spacers can be employed, as, for instance, the bars can be grouped in sets of two or more bars, etc. These bars and spacers are assembled on retaining members shown in the form of round rods 24, 25, these rods passing through suitable apertures in the grinding bars and spacers. The grinding bars and spacers occupy substantially the periphery of the section, and the section is completed by what may be termed an anchor bar, by which the grinding bars and spacers are united and held solidly, the anchor plate being so connected to the bars that it is impossible for it to come loose therefrom.

While this anchor member may be of various forms, it is illustrated in the form of a plate or rail 26 having side webs 27, 28, the ends of the rods 24, 25 passing through suitable apertures in the webs, and are secured to the bar in any suitable manner. In the construction shown the ends of each bar are turned or bent oppositely to each other, as indicated at 29, 30 against the sides of the webs, so that the plate or rail is securely anchored in place. Of course, if desired, the ends of the rods may be cut off and spot welded so as to hold them tightly in place, but the arrangement illustrated is a simple and convenient one and satisfactorily answers the purpose.

In assembling these units, a form of cast iron or other suitable material is employed in the shop, this form being a duplicate, as to internal dimensions, of a corresponding section of a Jordan shell, which latter are made and sold of uniform internal measurements. The bars and wood spacers and the anchor rail are assembled on the rods and are driven toward the small end of the form until the point is reached where the desired outside diameter of the assembled filling is obtained. The ends of the rods are then secured as above described, and the assembled unit is driven out of the form and is then ready for shipment to the customer for installation in a standard Jordan engine shell.

The other sections are made and assembled in the same way ready for use. These sections are installed in Jordan shells with which they are to be used by simply driving them in place, it being unnecessary to expand or contract any of the parts, so that the solid unitary character of the section is unchanged from the time it leaves the shop until it is installed for use. In installing the sections, the small section is driven in first, then the second, and then the third section. In accordance with the invention, means are provided for holding the sections in position in the shell so that they cannot move endwise relatively to the shell and so that they are prevented from rotary movement within the shell.

While these means may be somewhat varied, a simple and efficient device for doing this is that shown in the accompanying drawings. In the particular construction illustrated, referring first to the small section shown in Figure 2, the anchor plate or rail 26 is formed, at its inner end, that is, the end toward the smaller diameter of the section, with a slot 31 which engages the squared head 32 of a plug 33 which projects inside the shell of the Jordan. This head acts as a key, which prevents the section of the filling from turning inside the shell, and also acts as a convenient guide for inserting the section. The small section is driven in until it abuts against a shoulder 34 formed in the walls of the feed chamber 4, before referred to, the second section, marked 20, is then driven in in the same manner, a second square headed plug 36 being provided for holding this section against rotation. Preferably, this plug 36 is not in line with the first plug, but is located at a point about one-third of the distance around the shell from the location of the plug 32, this effecting a certain desirable relation of the grinding bars of the sections. This second section is driven into

the shell until its small end abuts against the large end of the first section that has been driven in. The third section is then similarly installed, being held against rotation by a square headed plug 37, this plug being preferably located at a point in the shell two-thirds around the shell from the location of the plug 32 to effect a desired arrangement of the bars of this third section relatively to the bars of the second section.

The sections are held against endwise movement by means of a bolt 38 at the outer end of the last section, which section is marked 21. this bolt passing through the wall of the shell and being screwed into the web of the anchor rail as indicated at 40 in Figure 6. This construction effectually prevents the endwise movement of the sections in the shell. Under some circumstances, this latter bolt might be omitted, if desired, as in the operation of a Jordan the water in the stock would cause the spacer woods to swell and thus clamp the sections in place sufficiently to prevent any endwise movement.

With the construction shown and described, it will be observed that a very simple and at the same time a pre-erected shell filling for a Jordan engine has been provided, one in which the user has nothing to do but insert the sections in the shell, and one in which any liability of the displacement of any of the parts of the fitting is effectually prevented.

While the invention has been shown and described in its preferred form, it will be understood that certain changes and variations may be made in the form and arrangement of the parts and in the number of sections used without departing from the invention as defined in the appended claims.

What I claim is:

1. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, means for securing the bars and spacers together, and an anchor member to which the securing means are firmly attached to form a solid unit ready for insertion in a shell.

2. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, holding members passing through the bars and spacers for holding them together, and an anchor member in which the ends of the holding member are secured to form a solid unit ready for insertion in a shell.

3. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers and an anchor member assembled in a complete circular rigid form of a diameter to completely fill the corresponding portion of the shell and ready without further manipulation for positioning in the shell.

4. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, holding rods passing through the bars and spacers for holding them together, an anchor member having a web, and means for securing the ends of the bars in the web.

5. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, circular rods passing through the bars and spacers, and an anchor rail or bar having a web through which the bars pass, the ends of the bars being bent to lock them in position.

6. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers and an anchor member assembled in a complete circular rigid form of a diameter to completely fill the corresponding portion of the shell and ready without further manipulation for positioning in the shell, and having means cooperating with the shell for preventing the rotation of the lining after positioning.

7. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, rods passing through the bars and spacers for holding them together, an anchor rail to which the ends of the bars are fastened, and means on the rail cooperating with the shell for holding the lining against rotation.

8. A preconstructed lining for Jordan engine shells, comprising grinding bars and spacers, rods passing through the bars and spacers for holding them together, an anchor member to which the ends of the bars are fastened, and a slot in the rail for engaging with the shell and holding the lining against rotation.

9. In a Jordan engine, the combination with the shell and core, of a complete rigid lining unit comprising bars, spacers and an anchor member positioned in the shell with a driving fit, and complementary groove and key arrangements in the shell and lining for holding the lining against rotation.

10. In a Jordan engine, the combination with the shell and core, of a plurality of complete lining units secured in the shell with a driving fit and abutting against each other when in position, and keys in the shell positioned out of line with each other and engaging the units and holding them against rotation.

11. In a Jordan engine, the combination with the shell and core, of a plurality of complete lining units secured in the shell with a driving fit and abutting against each other when in position, slots in each of the units, and keys in the shell positioned out of line with each other and engaging the units and holding them against rotation.

12. In a Jordan engine, the combination with the shell and core, of a plurality of complete lining units secured in the shell with a driving fit and abutting against each other when in position, keys in the shell positioned out of line with each other and engaging the

units and holding them against rotation, and a securing bolt at the outermost section for preventing endwise movement of the sections.

13. In a Jordan engine, the combination with the shell and core of a complete rigid lining unit comprising bars, spacers and an anchor member of a diameter equal to the inner diameter of the part of the shell it is to fit and positioned in the shell only by driving it into position, and means for preventing rotary and endwise movement of the lining.

In testimony whereof, I have hereunto set my hand.

EDWARD A. JONES.