Sept. 16, 1952 H. D. STUCK 2,610,554

JORDAN ENGINE PLUG CONSTRUCTION

Filed Dec. 17, 1947 2 SHEETS—SHEET 1

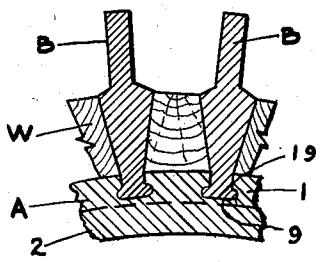


FIG 1

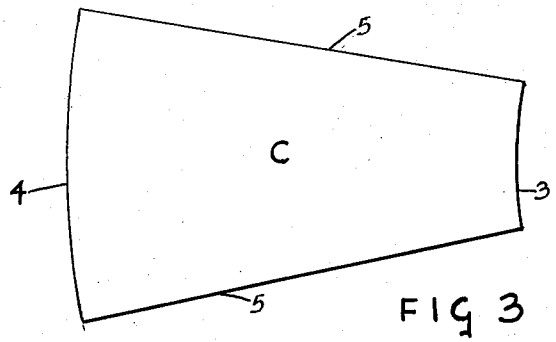


FIG 3

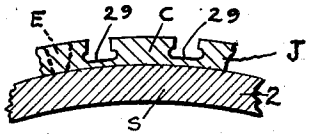


FIG 2

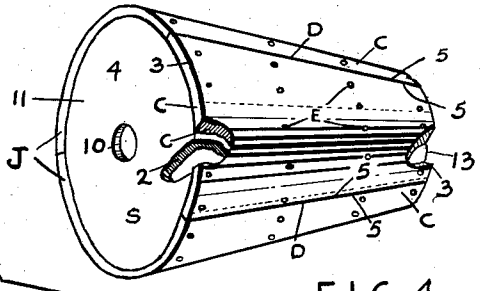


FIG 4

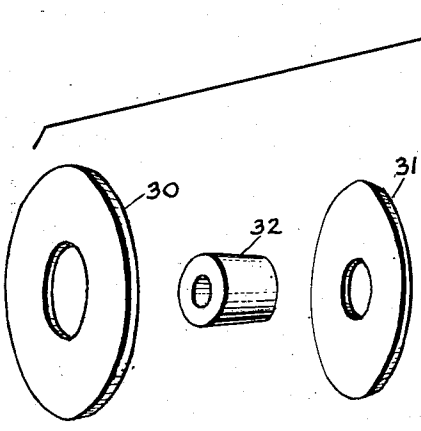


FIG 5

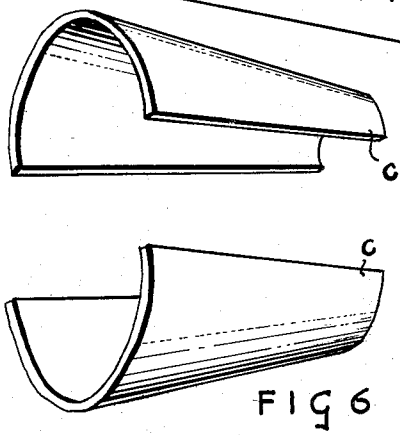


FIG 6

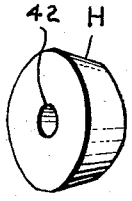


FIG 7

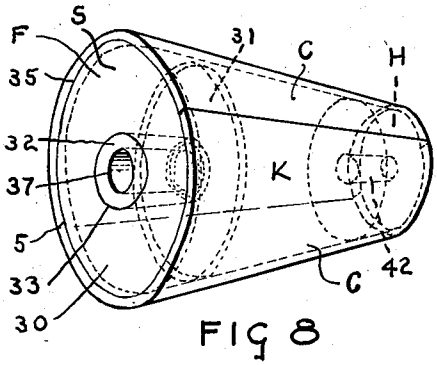


FIG 8

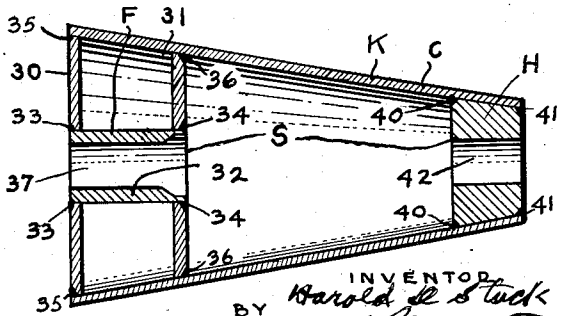


FIG 9

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JORDAN ENGINE PLUG CONSTRUCTION

Filed Dec. 17, 1947 2 SHEETS—SHEET 2

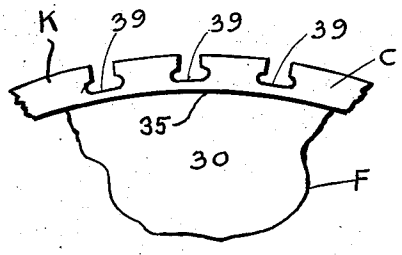


FIG 10

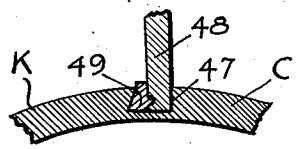


FIG 11

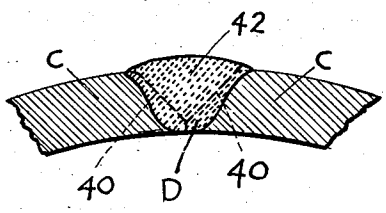


FIG 12

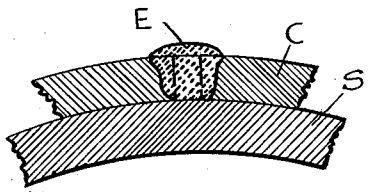


FIG 13

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UNITED STATES PATENT OFFICE

2,610,554

JORDAN ENGINE PLUG CONSTRUCTION

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Application December 17, 1947, Serial No. 792,289

3 Claims. (Cl. 92—27)

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This invention relates to the plugs of Jordan engines such as shown in patent to Bolton, No. 1,829,630 of October 27, 1931, and in patent to Stuck, No. 2,366,367 of January 2, 1945.

Jordan plugs are of truncated conical form and heretofore have each been made of a hollow casting supporting one or more annular bosses and bands, with slots to carry bars, or, sometimes, there is a skeleton body made up of annular spiders, and, sometimes, the bars are part of a complete casting. The truncated conical headed casting with no spiders or such supporting spiders alone constitute a supporting body for holding outwardly extending longitudinally extending cuttings bars.

The purposes of this invention are: 1—to provide for means of remaking Jordan plugs of the type shown in the Bolton patent or in the Stuck patent and; 2—of producing a new type of very strong lightweight plug, in which the major parts of the castings forming the outside or the supporting body are replaced by an outside, hollow truncated conical jacket or surface member which preferably has longitudinal grooves in which plug bars can be fixed.

In both cases this jacket member is made of a plurality of outside cone sections each of which is made of a high grade stainless steel or steel, bronze or other suitable metal which may be rolled or otherwise shaped, such outside cone sections extending around and forming the curved outside member of the plug. The sides or side edges of these sections are seam welded together and they, as parts of the outside member, are welded, as by plug welding, to the supporting body, which may be one of several types.

The body of the new type of plug includes a hub at the small end, and a hub at the large end preferably formed of light disks connected together by a metal tube. The disks and small hub are also welded to the surface of the complete or outside cone member.

In the drawings, Fig. 1 is a sectional detail view on a plane perpendicular to the axis of a Jordan plug of the type shown in patent to Bolton, No. 1,829,630 of October 27, 1931, before being repaired.

Fig. 2 is a similar view of the same plug after being repaired, omitting the bars and separators, but having new slots for bars.

Fig. 3 is a plan view of a section of an outside member before being shaped and Fig. 4 is an isometric view of three such members shaped, attached together and to a supporting member, but not slotted.

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Fig. 5 is an isometric view of the parts of a hub forming the large end of a supporting body for a new plug assembly.

Fig. 6 is a similar view showing two sections of an outside member and Fig. 7 is a similar view of a hub member for the small end.

Fig. 8 is an isometric view of an assembly of the parts shown in Figs. 5, 6, and 7 and Fig. 9 is a section on a longitudinally plane of the complete hub assembly shown in Fig. 8.

Fig. 10 is a view of adjoining parts of a supporting hub and an outside section member of a new plug assembly after the slots have been milled.

Fig. 11 is a diagrammatic sectional view of a slot and other parts which can be used in attaching bars to a type of plug such as shown in patent to Stuck, No. 2,366,367 of January 2, 1945.

Fig. 12 is a diagrammatic view of a continuous seam weld and Fig. 13 is a diagrammatic view of a plug weld.

In the drawings in every case S indicates a truncated conical supporting body which may be of the type indicated in Figs. 1, 2, 3 and 4 where a plug body of the type shown by Bolton, No. 1,829,630, includes a hollow slotted truncated conical outside member indicated by A, supported by heads 11 and 13. Outside A has slots 9 for the inner edges 19 of bars B of the type shown, with wood separators W between them.

I can reuse this type of old plug by removing the bars and separators and then cutting off the part 1, which includes the slots 9, down to the dotted line in Fig. 1, thus leaving part 2 which together with the heads 11 and 13 form what I will then call the supporting body and indicate as a unit by S.

In every case C will indicate a cone section of metal, preferably stainless steel, shaped as a part of a hollow truncated cone, which will be a new outside cone member or jacket J for the repaired plug. Fig. 3 shows a flat blank for a section C before bending. Each section C has a large curved end 4 which when bent fits outside an arc of the large end 11 of the supporting body S and another small curved end 3 which when bent fits outside an arc of the small end 13 of the supporting body. Each section C has substantially straight side edges or sides 5, 5. This construction is shown generally in Fig. 4 where 4 indicates the large curved end and 3 the small curved end and 5 indicates the straight adjoining side edges which are welded together as at D, Fig. 4, preferably by seam welding as shown in Fig. 12. E indicating plug welds to body S.

This is the process of repairing or remodelling a plug of the Bolton type and after completing a new outside cone or jacket with a plurality of such cone sections C, C, as shown in Fig. 2, I mill slots 29 similar to 9 for bars, such as B, or I might mill slots such as 47 shown in Fig. 11. Such slots may be long or short and are milled longitudinally to receive such bars as shown at B.

The slots 29 are so made that the outside of each slot or some part near the outside is narrower or smaller than some parts near the inside of that slot whereby, as this inside part of the bar is made to fit, each bar when driven in from the end is rigidly held in position.

On the construction of new plugs, which I will call fabricated plugs, I preferably use a new construction which is made by cutting out sections, and disks of rolled metal and shaping the sections. I use two hubs, namely a large hub F and a small hub H, which together form a supporting body similar to S for an outside member or jacket similar to J and which for convenience I will designate as K.

The large supporting hub F is made up of two disks 30 and 31 with a tubular connection 32, the two being welded together around the curved surface of tube 32 at 33, and 34, and to the cone sections C at 35 and 36. 37 is a shaft hole.

The supporting hub H at the small end can conveniently be a tube which is turned down on the outside to form a truncated cone to the outside curved surface of which is welded the inside surface of the cone sections indicated by C at 40 and 41. 42 is a shaft hole.

I use tubes of steel, preferably centrifugally cast for the tubes 32 and H, cut them to the right length and turn them down.

In the construction shown in Figs. 3 and 4, there are three of such sections C while in Figs. 6, 8 and 9, two sections are shown.

In every case however the cone sections C are welded and become a single outside member or jacket and fit the inside supports whether S or F and H and are welded thereto and together. When a hollow truncated conical outside member is complete and welded to a supporting body, slots such as 39, Fig. 10, are milled in it so as to fit bars such as B or slots 47 for bars 48 and key 49 may be used as shown in Fig. 11. The slots are narrower or smaller at the outside than some part of the inside and the interior edges of the bars are of the same size and shape as shown in Fig. 1 and Fig. 11, both being straight in a lengthwise direction so that a single bar B or a compound bar 48 with key 47 can be driven in lengthwise in a close drive fit at all points substantially the entire length of the jacket or outside curved member of the plug.

Instead of using rolled stainless or other steel, I can use rolled manganese bronze, rolled monel or other weldable metal.

Fig. 12 is a lateral cross section of a continuous seam weld D between two sections C, C, 40, 40 representing the original side edges of each section and 42 the welding material which holds them together. The dotted lines represent the adjoining edges before seam welding and the curved full lines after welding.

Fig. 13 shows a well known type of plug weld E between a cone section C and a support S.

I claim:

1. The combination in a Jordan engine plug having a truncated conical supporting body, of an outside member made of a plurality of sections of stainless steel each section being curved to fit the exterior of said supporting body and having substantially straight sides abutting the sides of adjoining sections and being seam welded thereto and the sections being also welded to the supporting body, there being outside slots in the outside member to receive and hold outwardly extending bars, the outside of each slot being smaller than some parts of the inside whereby each bar can be held in place against radial displacement.

2. The combination of a Jordan engine plug having a truncated conical supporting body, of an outside member made of a plurality of sections of rolled metal, each section being curved to fit the exterior of said supporting body and having edges abutting the edges of adjoining sections and welded thereto and the sections being also welded to the supporting body, there being outside slots in the outside member to receive and hold outwardly extending bars.

3. The combination in a Jordan engine plug having a substantially truncated conical supporting body, of an outside member made of a plurality of sections of rolled metal, each section extending longitudinally of said supporting body and being transversely curved to fit the exterior thereof, the sides of adjoining sections being welded together and the sections being also welded to the supporting body, with outwardly extending bars fastened to the outside of said outside member.

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