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SWIVEL POST LOCKING MEANS

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2 Sheets-Sheet 1

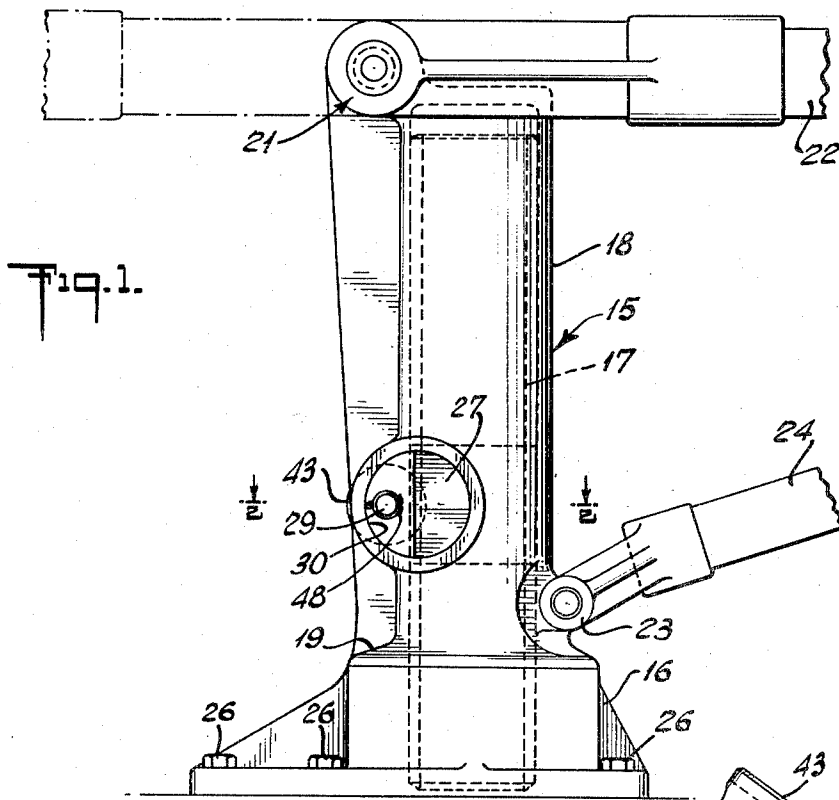


Fig. 1.

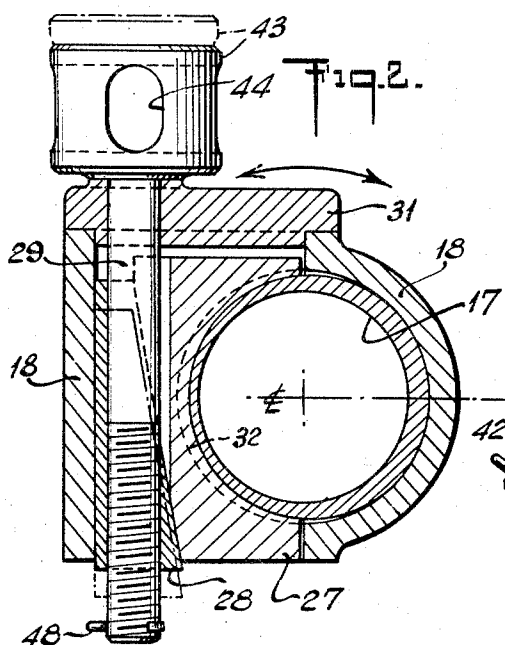


Fig. 2.

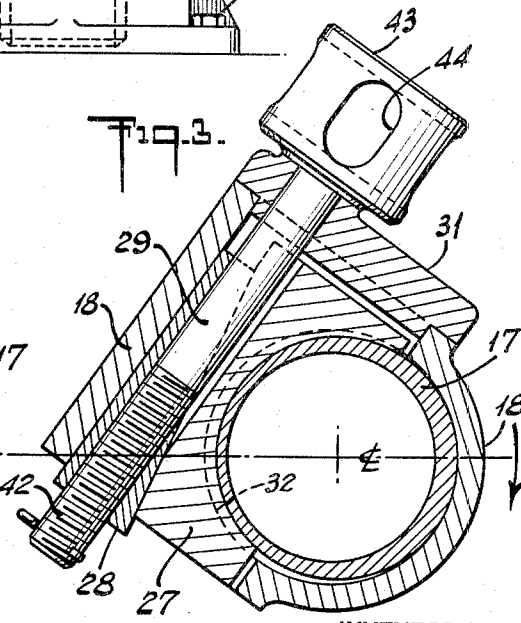


Fig. 3.

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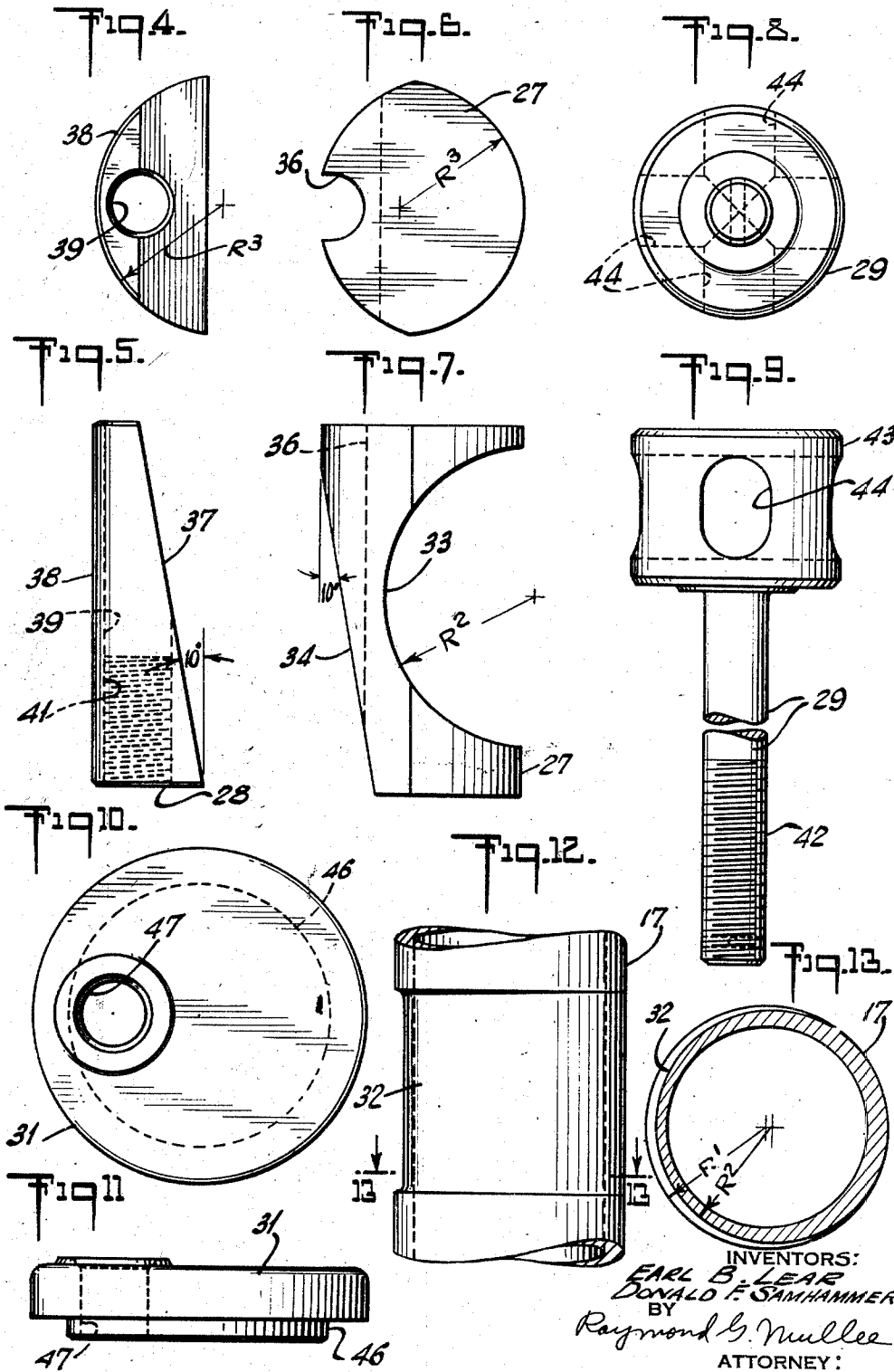
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SWIVEL POST LOCKING MEANS

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5 Claims. (Cl. 248—178)

This invention relates to a locking means for a swivel post assembly.

A swivel post assembly of the type under consideration, comprises a vertically mounted fixed post which is surrounded by a sleeve-like member, or swivel head, arranged for swivel movement about the fixed post. One or more of these posts are used, for example, on a mining machine generally referred to as "jumbo drill mounting," which basically comprises a platform mounted for movement on a trackway. Such a machine is commonly used in tunnelling operations. The swivel post supports an adjustable boom to which is affixed a drilling tool, such as a drifter. During drilling operations it is necessary to lock, or clamp, the swivel head to the post to prevent movement of the boom about its pivot. In working on wide tunnel faces where the boom must be swung out almost 90° to the axis of the trackway, and with the reactive thrust of the drilling tool acting parallel with the trackway, it is difficult to clamp the swivel head to the post tightly enough to prevent the boom from being forced backward from the tunnel face, due to excessive vibration together with the reactive force of the drilling tool feeding mechanism.

The object of this invention is to provide a locking means which will effectively lock a swivel head upon its supporting post, under any type of drilling conditions.

A further object is to provide a locking means for a swivel post which will automatically increase its holding effect as the torque effect of the boom increases.

Another object is to provide a swivel post locking means which has a low initial and maintenance cost, is simple in structure and easy to use, and which will give long and effective service.

These and further objects of the invention will become apparent from the following disclosure when considered with the included drawings, wherein:

Fig. 1 is an elevation view of a swivel post assembly having applied thereto a locking means of the invention;

Fig. 2 is an enlarged sectional view as seen from line 2—2 of Fig. 1;

Fig. 3 is a sectional view similar to that of Fig. 2, but with the swivel head at an angle to the fixed post;

Fig. 4 is an end view of a swivel head clamp wedge of the invention, and in a scale somewhat greater than that of Fig. 2;

Fig. 5 is a side view of the swivel head clamp wedge of Fig. 4;

Fig. 6 is an end view of a swivel head clamp of the invention in the same scale as Fig. 4;

Fig. 7 is a side view of the swivel head clamp of Fig. 6;

Fig. 8 is an end view of a swivel head clamp bolt of the invention, and in the same scale of Fig. 4;

Fig. 9 is a side view of the swivel head clamp bolt of Fig. 8;

Fig. 10 is a plan view of a swivel head clamp end plate of the invention, and in the same scale of Fig. 4;

Fig. 11 is a side view of the swivel head clamp end plate of Fig. 10;

Fig. 12 is a fragmentary elevation view of a post which supports the swivel head, and showing an eccentric portion which forms part of the locking means of the invention, and in the same scale of Fig. 4;

Fig. 13 is a sectional view as seen from line 13—13 of Fig. 12.

Referring now to Fig. 1, numeral 15 indicates a swivel post assembly, having a base portion 16, to which is secured a post member 17, in the form of a hollow shaft, and a swivel head 18, surrounding or encasing the post member, and having a flared portion 19 at the lower end to provide a bearing engagement with the top surface of the base portion 16. The interior diameter of the swivel head 18 is slightly greater than the outer diameter of the post member 17, so that the swivel head can be easily rotated about the post member when mounted as shown. At the upper end of the swivel head 18 is provided a pin receiving pivot portion 21, for affixing thereto a boom 22, the end of the boom shown being in the form of a yoke to provide clearance with the swivel head when the boom is rotated downwardly about pivot portion 21, as can be readily understood. Near the lower end of the swivel head 18, and directly opposite the pivot portion 21, is a pin receiving pivot portion 23, for affixing thereto an actuating arm 24, an end portion thereof being shown, said arm 24, incorporating an actuating means (not shown) which is connected to the boom 22, to provide raising or lowering motion thereto. The assembly 15 is attached to the platform (not shown), of a jumbo drill mounting by means such as bolts 26, so that the centerline as indicated on Fig. 2, is parallel with the trackway upon which the drill mounting is to move.

The locking means of the invention comprises a swivel head clamp piece 27, a swivel head clamp wedge 28, a clamp bolt 29, and an end plate 31, all of which are arranged within a cross bore 30, formed in the swivel head 18. The post member 17 has a portion which is undercut to an offset radius R^2 , to provide an eccentric section 32, as is best seen in Fig. 13. A side of the clamp piece 27 has a cut-out 33 of radius R^2 , whereby the piece can engage the post section 32, while the opposite side has a 10° tapered flat surface 34. A bolt clearance slot 36, which intersects the tapered surface 34, is formed lengthwise in the clamp piece 27. The side of the clamp piece having the cut-out 33, is formed with a radius of R^3 (Fig. 6) which corresponds with the internal radius of the swivel head cross bore 30.

The clamp wedge 28 is of somewhat shorter length than the clamp piece 27, and has a 10° tapered surface 37 on one side, and a curved surface 38 of radius R^3 on the opposite side. A hole 39 formed lengthwise in the wedge 28, has a threaded portion 41 at the thicker end of the wedge. The clamp bolt 29 has a threaded portion 42 for engagement with the thread portion 41 of the clamp wedge, and an enlarged head 43, in which are formed two intersecting transverse holes 44. End plate 31 has a circular projection 46 which is arranged to fit within the swivel head cross bore 30, and a hole 47 which is of slightly greater diameter than the outside diameter of the clamp bolt threaded portion 42.

To arrange the locking means in the swivel post assembly, the clamp piece 27 is placed in the cross bore 30, and the swivel head is lowered over the post member 17. The wedge 28 is inserted in the cross bore 30 so that the tapered surface 37 thereof engages the tapered surface 34 of the clamp piece, to cause the cut-out 33 of the latter to engage the eccentric section 32 of the post member. The end plate 31 is then placed in position over the end of the cross bore 30, and the clamp bolt 29 is inserted through hole 47 of the plate, and is screwed into the clamp wedge 28, by virtue of threaded portions 41 and 42. A cotter key 48 is applied to the exposed end of

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the bolt so that the latter cannot be inadvertently screwed out of the wedge 28.

When it is desired to lock the swivel head 18 to the post member 17, the bolt 29 is turned to draw the wedge 28 inwardly with respect to the cross bore 30, to force the clamp surface 33 into engagement with the surface of the post eccentric section 32. Tool means, such as a bar, may be inserted in the bolt holes 44, to provide leverage to attain a tight engagement between surface 33 and the surface of post section 32. Once a tight engagement is thus made, it will be seen (Fig. 2), that torsional force applied to the swivel head 18 to effect rotation thereof about the post 17, will cause the clamp 27 to grip tighter, and in proportion to the rotary force on the swivel head, as it tends to be advanced upon the increasing diameter of the eccentric section 32, and thereby prevent slippage or rotation of the swivel head. Fig. 3 illustrates a condition wherein the boom 22, and consequently the swivel head 18, has been rotated to a given degree with respect to the post 17 and locked, as may be desired under certain operating conditions. The direction of the torsional force tending to effect rotation of the swivel head 18, is indicated by an arrow; under such conditions it will be seen that the locking arrangement of the invention, will be effective to prevent slippage, or rotation, of the locked swivel head, as pointed out heretofore.

When it is desired to release the locking engagement, the bolt 29, is loosened and the bolt head 43 is given a sharp blow to release the wedge 28 from engagement with the clamp 27. The swivel head 18 can then be easily rotated about the post 17 to any desired position.

What is claimed is:

1. In a swivel post assembly including a post member having an eccentric portion and a swivel head mounted for rotary movement on the post member, a locking means comprising clamp means interposed between the post member and swivel head and engaging said eccentric portion of said post member, and means to force said clamp means into tight engagement with the eccentric portion so that increased locking effect is provided in proportion to increased rotary forces applied to the swivel head.

2. In a swivel post assembly including a post member having an eccentric portion and a swivel head mounted for rotary movement on the post member, a locking

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means comprising clamp means interposed between the post member and swivel head and engaging said eccentric portion of said post member, a wedge means interposed between the swivel head and clamp means, and draw means to force the wedge means into tight engagement with the clamp means whereby the clamp means will resist in direct proportion rotary forces applied to the swivel head.

3. In a swivel post assembly locking means according to claim 2, wherein said draw means comprises a bolt.

4. In a swivel post assembly including a post member having an eccentric portion and a swivel head mounted for rotary movement on the post member, a locking means comprising clamp means interposed between the post member and swivel head and engaging said eccentric portion of said post member, a wedge means interposed between the swivel head and clamp means, an end plate removably affixed to the swivel head, and a bolt extending through the end plate and threadably engaging the wedge means whereby the latter may be forced into tight engagement with the clamp means.

5. In a swivel post assembly including a post member having an eccentric section formed by an offset diameter and a swivel head mounted for rotary movement on the post member and having a cross bore, a locking means disposed in said cross bore comprising, a clamp member having on one side a curved surface to engage the post eccentric section and a tapered surface on the opposite side thereof, a wedge member having on one side a tapered surface engaging the tapered surface of the clamp member and engaging an internal wall portion of the cross bore on the opposite side, an end plate removably affixed to the end of the cross bore, and a bolt extending through the end plate and threadably engaging the wedge member whereby the latter may be forced into tight engagement with the clamp member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,260,635 Musselman ----- Oct. 28, 1941

FOREIGN PATENTS

570,254 France ----- Apr. 26, 1924

581,413 France ----- Nov. 28, 1924