Jan. 1, 1946. B. BANNISTER 2,391,939

CATHEAD

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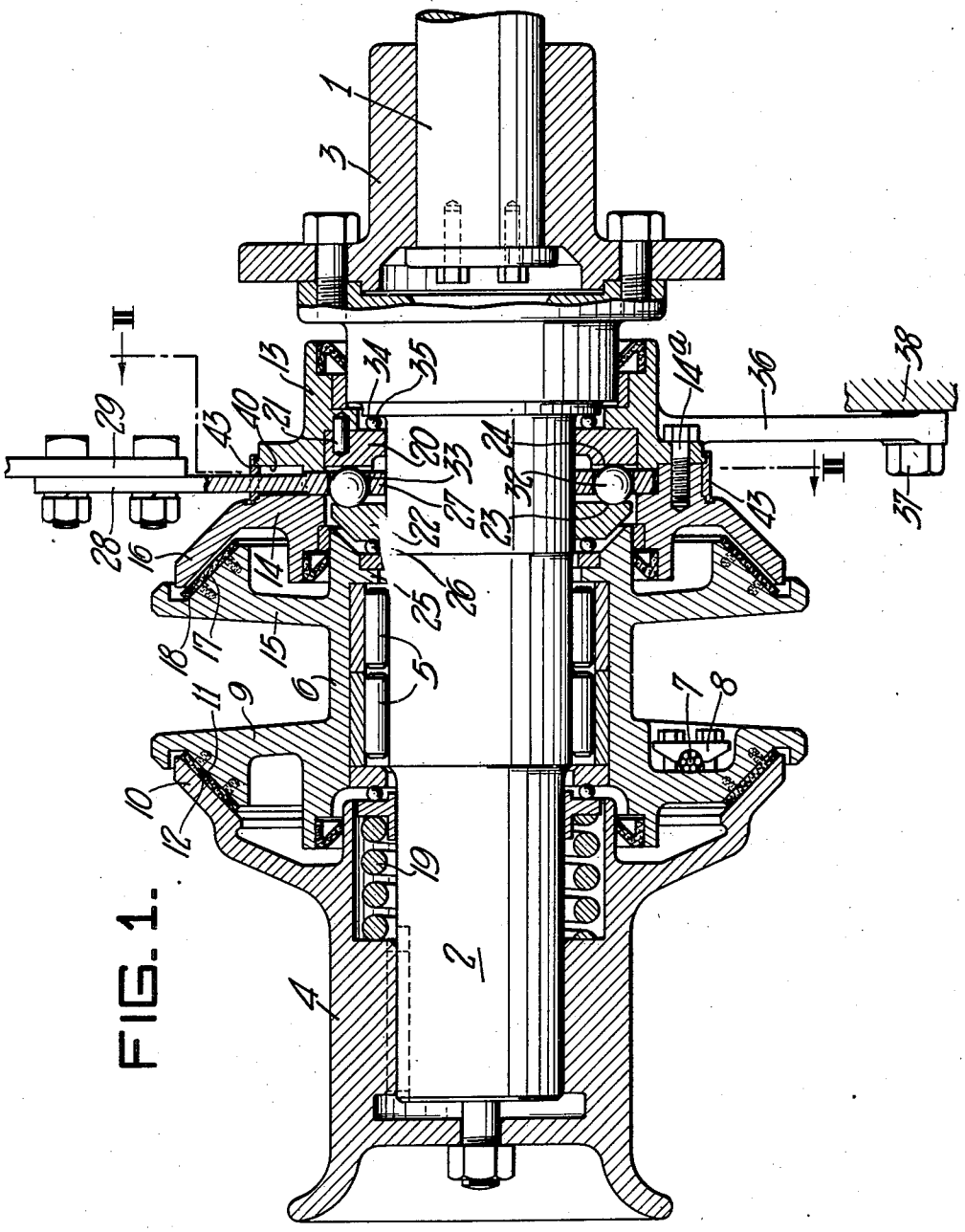


FIG. 1.

Inventor:
BRYANT BANNISTER,
by: John E. Jackson
his Attorney.

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FIG. 2.

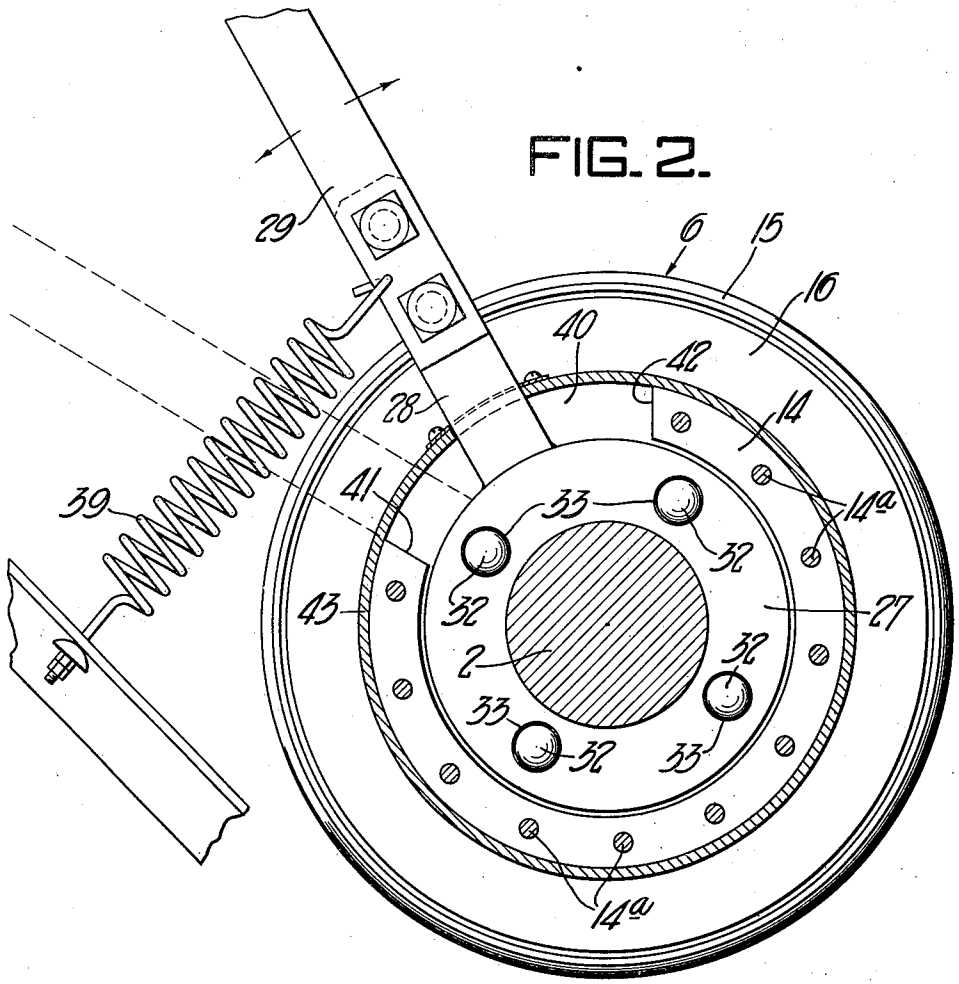
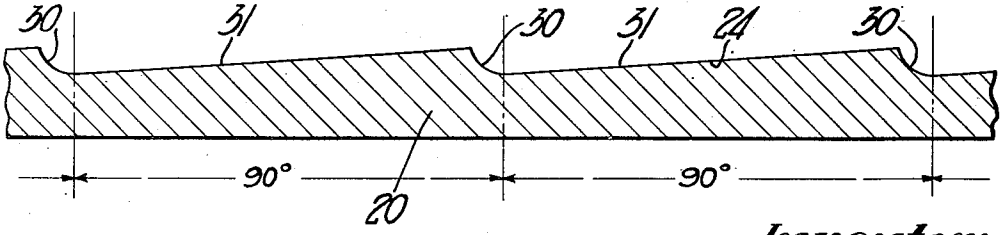


FIG. 3.



Inventor:
BRYANT BANNISTER,
by: John E Jackson
his Attorney.

Patented Jan. 1, 1946 2,391,939

UNITED STATES PATENT OFFICE

2,391,939

CATHEAD

Bryant Bannister, Oil City, Pa., assignor to Oil Well Supply Company, a corporation of New Jersey

Application June 15, 1944, Serial No. 540,490

2 Claims. (Cl. 254—185)

My invention relates to improvements in catheads of the character employed in well drilling operations. Such catheads are generally carried upon and driven by the well drilling hoist, and are utilized for spinning up the joints of drill pipe, etc.

My invention contemplates a controlled cathead which is normally inoperative, but which may be selectively operated and automatically stopped when desired, thereby providing complete control of the spinning operations being effected thereby.

I also have in view, the provision of such a cathead in addition to the conventional cathead, constructed and embodied in a compact and efficient device which may be readily applied to a hoist, as by means of one of the driven shafts of the latter.

A further object is to provide an actuating mechanism for such a cathead which will have positive and efficient action to effect engagement and disengagement with the source of power therefor.

Additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a longitudinal section of a cathead embodying my invention;

Fig. 2 is a cross section taken on the line II—II of Fig. 1; and

Fig. 3 is a partial section taken on the pitch circle of the actuating cam of said cathead.

Referring to the drawings, 1 designates a portion of a driven shaft of a hoist of the type generally employed in well drilling operations. For example, the shaft 1 may be the line shaft of such apparatus, and for the purpose of mounting my improved cathead, the said shaft 1 is provided with an aligned extension 2, secured to and rotatable with the shaft 1 by means of a flanged collar or connection 3.

Secured to the outer end of the extension shaft 2 and rotatable therewith is a driven member 4 which may comprise a conventional cathead. Freely mounted on said extension shaft 2, as by means of roller bearings 5, I provide an additional cathead or flanged reel 6, the latter being adapted to receive a spinning line 7, one end of which is secured to the reel 6 as by means of a clamp 8. The driven member or cathead 4 and one flange 9 of the reel 6 are formed with coacting conical clutch portions 10 and 11 respectively, the latter being faced with a layer 12 of clutch facing material.

On the opposite side of reel 6 from the driven member or cathead 4, I provide a brake, including stationary housing members 13 and 14, bolted together at 14a. The member 14 and the other flange 15 of reel 6 are provided with coacting conical brake flanges 16 and 17 respectively, the latter being provided with a brake lining 18. The inclination of the said conical brake portions 16 and 17 is opposite to that of the conical clutch portions 10 and 11, so that the clutch and brake provided thereby may be alternately engaged by movement of the reel 6 between said clutch and brake on the shaft extension 2. The brake housing 13, 14 is secured against axial movement upon the said shaft 2, as hereinafter described, and a spring 19 is disposed between the driven member or cathead 4 and the reel 6, normally displacing the latter into braking position with the said clutch disengaged.

Means are provided for manually and axially shifting reel 6 from its normal braked position into clutching position in order to selectively drive the cathead or reel 6 from the driven shaft 2. For this purpose, I provide a cylindrical actuating cam 20 positioned within a provided recess in the housing member 13 and being secured against rotation with respect to said housing by means of a pin 21 entered in said cam and housing. Spaced axially from the cam 20 is a thrust collar 22 having an annular semi-spherical race 23 in the face thereof toward the cam face 24. The thrust collar 22 bears against an abutment 25 of the hub portion of the reel 6 through an intervening thrust bearing 26.

Rotatably disposed between and within the housing portions 13 and 14 is an actuating ring 27, the body of which is disposed between the race 23 of thrust collar 22 and cam face 24 of the cam 20. The ring 27 is provided with a radial extension 28 projecting outwardly from the housing 13, 14 for attachment to an actuating lever 29.

As shown in Fig. 3, the face 24 of the cam 20 is provided with a series of recesses 30 connected by inclined portions or wedges 31 coacting with a corresponding number of spherical balls 32 to move the thrust collar 22 and reel 6 against the action of the spring 19 upon movement of the said balls 32 from their said recesses 30 along the wedges 31 by rotation of the actuating ring 27. Four of such balls are shown, the same being loosely mounted and carried in recesses 33 within the actuating ring 27.

The housing 13, 14 abuts against shoulder 34 of the shaft 2 under the force of spring 19, through a thrust bearing 35, the cam 20 acting

as a race for said bearing. An anchor arm 36 extends radially from the housing member 12 and is secured as at 37 to a portion of the hoist frame or the like, indicated at 38, whereby the housing 13, 14 and cam 20 are secured against rotation.

Thus, the free reel or cathead 6 is normally braked and held against rotation under the action of spring 19, with the balls 32 in sockets 30 of cam 20. Upon rotation of lever 29, the reel 6 is shifted to disengage the brake means and engage the clutch 10, 12 whereby the said reel is driven by the shafts 1, 2. The lever 29 and the cam and ball action are shown in Figs. 1 and 2 in position to clutch the reel 6 to the said shafts.

When it is desired to stop the reel 6, the lever 29 is released, and the reel is automatically shifted by the spring 19 into braking position. A spring 39 may be connected to lever 28, 29 to assist in moving the parts automatically and quickly to braking position. Housing member 14 is cut away at 40 to permit the desired travel of lever 28, 29, and to provide stops 41 and 42 defining such travel. An annular guard 43 may be secured to the lever member 28 as shown, the said guard having annular sealing engagement with the housing members 13 and 14 to close the joint therebetween, and particularly the cut-away portion 40.

The lever 29 may be disposed adjacent the driller's position at the hoist whereby he may readily control the spinning line to spin up the drill pipe joints. The automatic braking feature of my improved cathead provides immediate control of the spinning line, and is an effective guard against accident, both to men and equipment.

Various changes and modifications are contemplated within the scope of the following claims.

I claim:

1. A cathead assembly including a rotatable shaft, a cathead secured to the outer end of said shaft, a spinning reel freely rotatable and slidable on the shaft, said cathead and reel having coacting clutch flanges at one side of the reel, a stationary housing at the other side of the reel, said reel and stationary housing having coacting brake flanges, a spring engaging the cathead and reel to normally displace the latter and engage said brake flanges, means for displacing the reel against the action of said spring to disengage the brake and engage the clutch flanges, said means including a cam within and secured to the housing, rotatable actuating means within the housing and axially movable on the shaft by the cam to displace said reel into clutching position, a manually operable lever extending outwardly through the housing for rotating the actuating means in a direction to effect said reel displacement, and a spring for the lever to automatically return the actuating means and permit the return of the reel to braking position by the first mentioned spring upon releasing said lever.

2. A cathead assembly including a rotatable shaft, a cathead secured to the outer end of said shaft, a spinning reel freely rotatable and slidable on the shaft, said cathead and reel having coacting clutch flanges at one side of the reel, a stationary housing at the other side of the reel, said reel and stationary housing having coacting brake flanges, a spring engaging the cathead and reel to normally displace the latter and engage said brake flanges, means for displacing the reel against the action of said spring to disengage the brake and engage the clutch flanges, said means including a cam within and secured to the housing, said cam having a transverse face formed with a series of alternate recesses and inclined wedge portions, a ball for each wedge portion normally received in adjacent recesses in inoperative position, a rotatable actuating ring within said housing having a series of sockets therein rotatably receiving said balls, a thrust washer engaging the balls and reel, a manually operable lever secured to the ring and extending outwardly through the housing, means permitting rotation of said lever and ring in a direction to displace said balls and the reel to the clutching position of the latter, and a spring for automatically retracting the said actuating means upon releasing said lever, to permit the return of the reel to braking position by the first mentioned spring.

BRYANT BANNISTER.