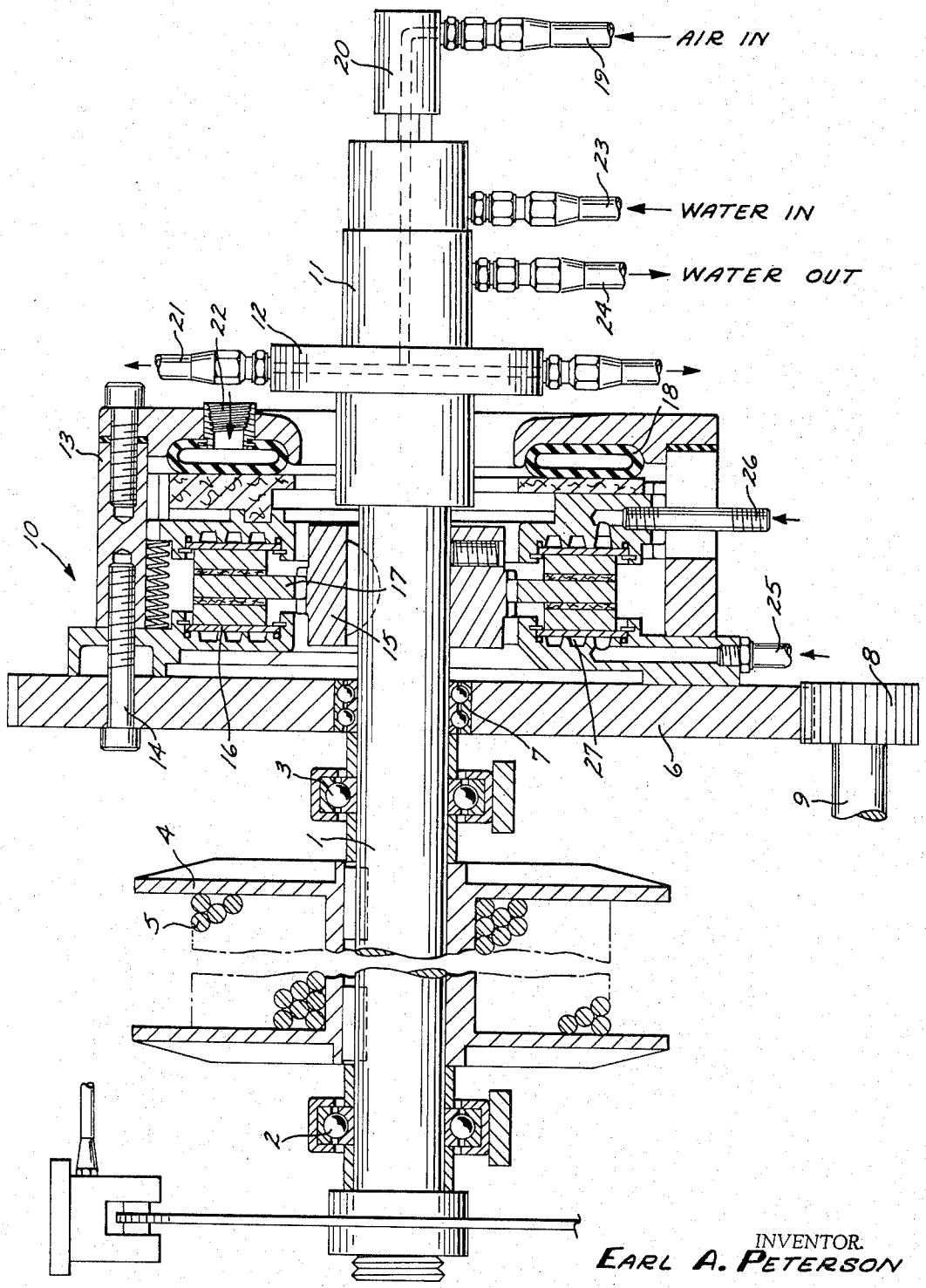
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SLIP CLUTCH CONSTANT TENSION WINCH

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SLIP CLUTCH CONSTANT TENSION WINCH

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ABSTRACT OF THE DISCLOSURE

The combination of a constant tension winch with a constantly slipping clutch provides a mechanism when the load attached to the winch has a constant tension thereon, so that this load will not move relative to the winch. The amount of slippage of the clutch can be varied to alter the tension on the winch as might be required. Even though the load is stationary at times, the clutch is still slipping during the periods of movement or non-movement of the load.

This invention relates to a slip clutch constant tension winch where the clutch portion of the device slips constantly, but the rate of slippage is variable by the operator to alter the amount of tension on the cable which reels onto or off of the winch drum.

An object of my invention is to provide a novel slip clutch constant tension winch in which the clutch is of a type which can be effectively cooled to absorb the heat generated in the clutch due to its slippage.

Another object of my invention is to provide a novel constant tension winch device in which the clutch associated therewith is of the constant slip type, and where the cooling medium is a suitable gas or liquid, and also where the tension of the clutch is controlled by a suitable liquid or gas.

Still another object of my invention is to provide a novel constant tension winch of the character stated in which the winch and the clutch are arranged in a unit and is, therefore, relatively compact and more effective in operation.

Other objects, advantages and features of my invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

In the drawing:

The figure in the drawing is a longitudinal vertical sectional view of my slip clutch constant tension winch.

Referring more particularly to the drawing, the numeral **1** indicates a horizontal shaft with journaled bearings **2** and **3**. A winch drum **4** is nonrotatably mounted on the shaft **1** between the bearings **2** and **3**, and the usual cable **5** is spooled onto the drum **4** and moves either off of or onto that drum, depending upon the requirements of the winch. In this invention it is desirable that a constant tension be maintained on the cable **5** as it moves onto or off of the drum **4** and, furthermore, that the amount of tension on the cable **5** can be altered or adjusted by the operator to suit the particular requirements to which the winch is placed. A master gear **6** is journaled on the shaft **1** on the bearing **7**. The master gear **6** is rotated by a pinion **8** and from a suitable source of power applied to the shaft **9**, which power is not shown. The master gear **6** is rotated at a constant speed, and power from the gear **6** is transmitted to the shaft **1** through a clutch **10**. The clutch **10** may be any one of a type known as constant slip, and one of the types which is suitable is illustrated in Patent No. 2,944,790, July 12, 1960, and particularly FIG. 4 of this patent. Since the clutch mechanism slips constantly, in order to maintain the required tension on

the cable **5** while that cable is moving relative to the drum **4**, it is necessary that the clutch shall be adequately cooled so that the heat caused by slippage is dissipated and, therefore, the engaging parts of the clutch will not be injured.

A sleeve **11** is journaled on the shaft **1** and normally remains stationary as far as the shaft is concerned. A distributor ring **12** is journaled on the sleeve **11** and, therefore, rotates on the sleeve and turns with the outer shell **13** of the clutch **10**. The shell **13** is bolted or otherwise fixedly attached to one face of the gear **6** by means of a plurality of bolts or studs **14**. Thus the outer shell or housing of the clutch **10** will be rotated constantly as the gear **6** rotates and will turn at the same speed as the gear.

The inner ring **15** of the clutch **10** is suitably attached to the shaft **1** to rotate the shaft through the usual media of frictional clutch plates **16**, which are pressed into engagement with the driving ring **17** by suitable control means such as the expandable tube **18**. This expandable tube is activated by appropriate fluid pressure, such as air under pressure, and this air is admitted from a compression or the like in the pipe **19** and then passes through a fitting **20**, thence into the sleeve **11** and, finally, into the ring **12**. A plurality of pipes **21** extend from the ring **12** and thence to couplings **22** which admit the air under pressure into the tube **18**. As the tube **18** expands it forces the friction plate **16** against the drive ring **17**, and thus will rotate the shaft **1** at the desired speed and exerting the necessary tension or pull on the cable **5**.

Since there is constant slippage in the clutch **10** between the driving plates **16** and the corresponding engaged parts, it will be necessary to effectively cool the driving parts of the clutch **10**, and this is accomplished by a suitable cooling media such as water, which is conducted through the pipe **23** and then into the sleeve **11** and out of this sleeve through a pipe **24** to the intake fittings **25** and **26**. The cooling fluid is then circulated in the cooling passages **27** in the clutch **10** to effectively cool the clutch and carry away the heat engendered by friction. Constant tension is thus maintained on the cable **5** and this tension can be varied by the operator by controlling the pressure of the air in the tube **18**, or by some similar control means. The clutch **10** will slip constantly, but at the same time the drum **4** will be rotated to reel in the cable **5** due to the constant rotation of the drive gear **6** and the consequent driving of the clutch **10**.

Having described my invention, I claim:

1. A slip clutch constant tension winch comprising a shaft, a drum mounted on said shaft and a cable reeled on the drum, a drive gear journaled on said shaft, drive means, a pinion meshing with the drive gear, said pinion being driven by the drive means, a constant slip clutch interposed between said drive gear and said shaft, the rate of slippage of said clutch being varied by an operator, and cooling means in said clutch to constantly cool the engaging parts of the clutch to permit the clutch to slip constantly over long periods of time without overheating and without moving a load attached to said cable vertically to any appreciable extent.

2. A slip clutch constant tension winch as recited in claim **1** and said cooling means including a fluid conduit, said clutch having cooling passages therein and said conduit extending to said passages.

3. A slip clutch constant tension winch as defined in claim **1**, and said drive gear being journaled on the shaft, said cooling means including a fluid conduit, said clutch having cooling passages therein and said conduit extending to said passages.

4. A slip clutch constant tension winch as recited in claim 1, and said constant slip clutch including a shell, means securing said shell to the drive gear, friction disks in said clutch, and an expansible tube operatively connected to the friction disks to engage the friction disks on expansion of the tube.

5. A slip clutch constant tension winch as recited in claim 1, and said constant slip clutch including a shell, means securing said shell to the drive gear, friction disks in said clutch, and an expansible tube operatively connected to the friction disks to engage the friction disks on expansion of the tube, said cooling means including a fluid conduit, said clutch having cooling passages therein and said conduit extending to said passages.

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