Feb. 10, 1925. 1,525,666

D. SMITH

BRAKE EQUALIZING APPARATUS

Filed May 22, 1923 2 Sheets-Sheet 1

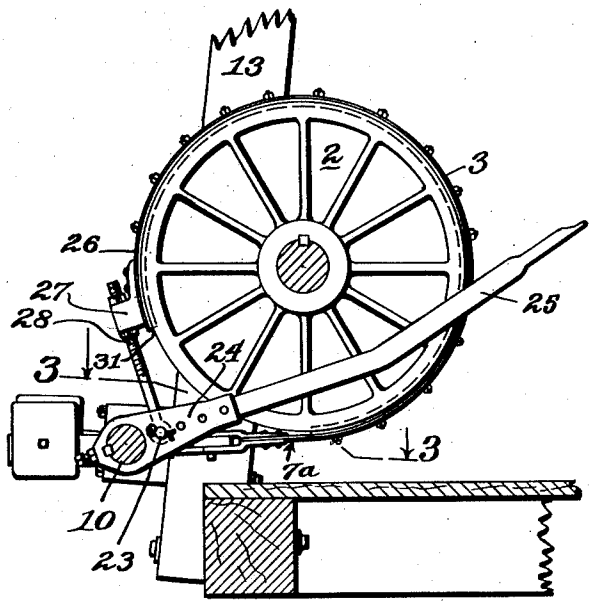


Fig. 1.

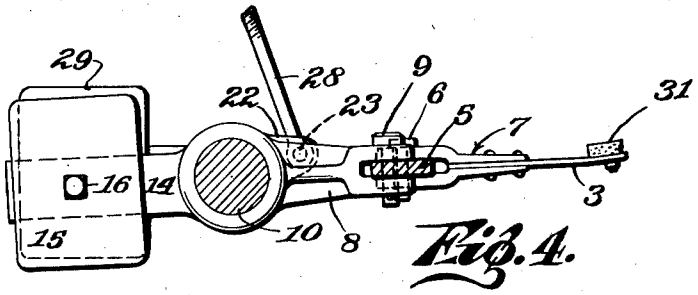


Fig. 4.

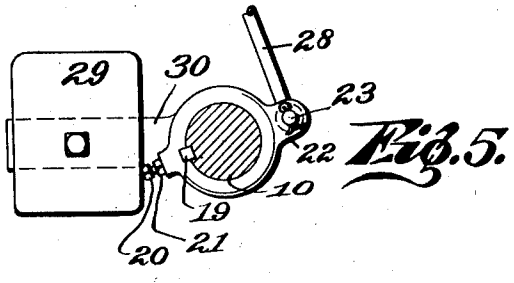


Fig. 5.

INVENTOR.
David Smith,
BY Lyon & Lyon
ATTORNEY.

Feb. 10, 1925. 1,525,666

D. SMITH

BRAKE EQUALIZING APPARATUS

Filed May 22, 1923 2 Sheets-Sheet 2

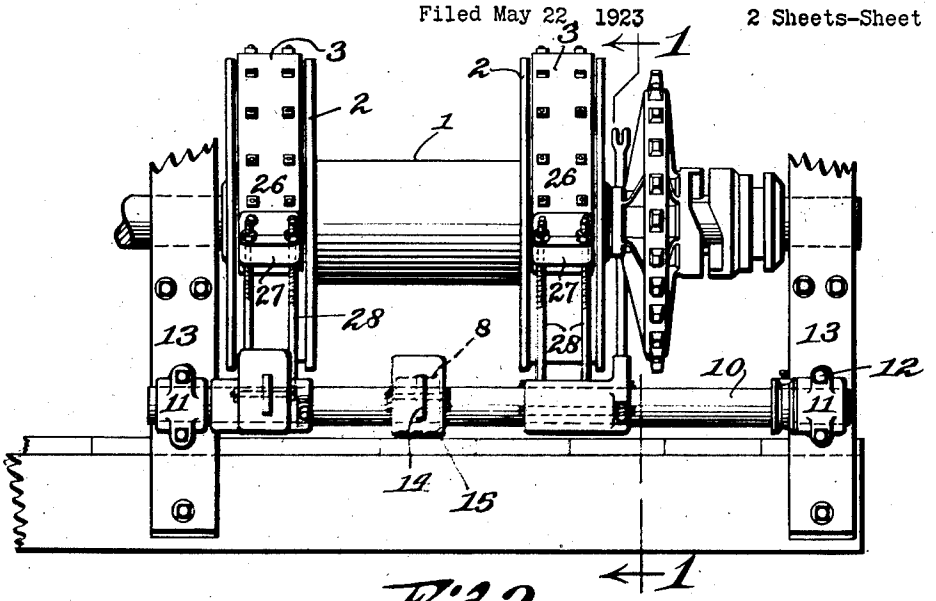


Fig. 2.

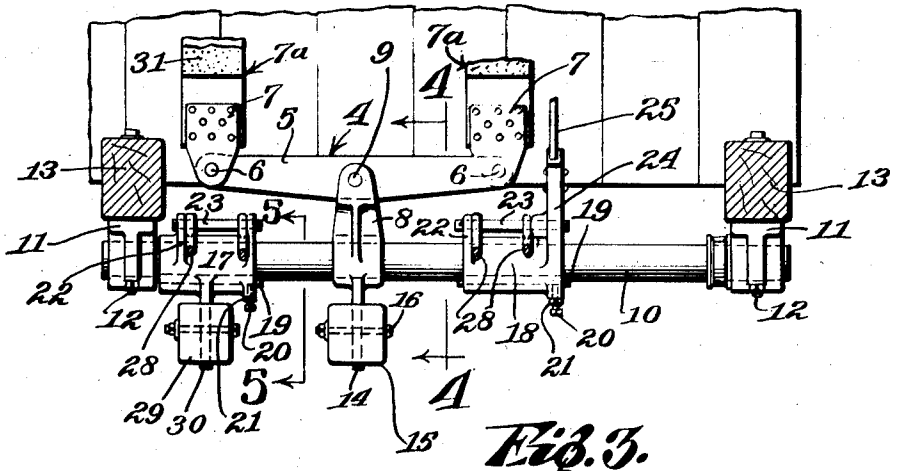


Fig. 3.

INVENTOR.
David Smith,
BY Lyon & Lyon
ATTORNEY.

Patented Feb. 10, 1925. 1,525,666

UNITED STATES PATENT OFFICE.

DAVID SMITH, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO UNION TOOL COMPANY, OF TORRANCE, CALIFORNIA, A CORPORATION OF CALIFORNIA.

BRAKE EQUALIZING APPARATUS.

Application filed May 22, 1923. Serial No. 640,704.

To all whom it may concern:

Be it known that I, DAVID SMITH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Brake-Equalizing Apparatus, of which the following is a specification.

This invention relates to a brake equalizing apparatus and is particularly adapted to brake-drums of rotary draw works such as used in drilling oil wells or similar operations. These brake devices usually include brakebands which are applied to the flanges of the drum, and it is desirable to provide an equalizing device so that when the braking force is applied it will be distributed substantially equally between the brakebands. The general object of the invention is to provide a simple device of this kind which is self-contained, that is to say, the parts are all connected together so that they can be removed as a whole from the derrick; also to provide a device of this kind with simple means for holding the live ends of the brakebands substantially clear of the drum, thereby reducing the amount of wear on the brakebands when the drum is running free; also to provide a compact structure of this character in which the dead ends of the bands are substantially counterweighted so that only a slight movement of the operating lever will be necessary in order to apply the braking force although the bands are held out of actual contact with the flanges of the brake-drum.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient brake equalizing apparatus.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a vertical section taken through the derrick floor at one edge and passing through the shaft of the drum and through the rock-shaft of my equalizing apparatus, portions of the derrick being broken away. This view may be regarded as a section on the line 1—1 of Figure 2.

Figure 2 is a rear elevation of the equalizing apparatus showing portions of the derrick broken away.

Figure 3 is a section taken about at the level of the line 3—3 of Figure 1 and showing the lower parts of the mechanism substantially in plan, while the uprights of the derrick frame are shown in horizontal section.

Figure 4 is a vertical section taken on the line 4—4 of Figure 3.

Figure 5 is a similar section on the line 5—5 of Figure 3.

In practicing my invention, I provide a plurality of brakebands to cooperate with the drum. In the present instance, the drum 1 is provided with two brake-flanges 2 carrying two brakebands 3. These brakebands have their dead ends disposed substantially under the drum (see Fig. 1) and are connected together by an equalizing device 4 which operates to distribute the braking force between the two brakebands. This equalizing device preferably consists of an equalizing bar 5 the ends of which are connected by pivot-pins 6 with shackle-plates 7 secured to the ends of the bands. The equalizing device may be anchored in any suitable manner, but is preferably connected with the other parts so as to produce a self-contained construction.

In order to accomplish this, I provide a member 8 in the form of a bracket which is attached by a pivot-pin 9 to the equalizer bar at a point midway between the two brakebands, and this bracket is mounted as a sleeve on a rock-shaft 10 which is capable of applying the braking force to the brakebands. The ends of this shaft are rotatably mounted in two bearings 11 having means such as the bolts 12 for securing the same to the first and second posts 13 of the draw works. The rock-shaft is supported thereby on the outer side of the derrick. I provide means for counterweighting the dead ends 7^a of the brakebands, and for this purpose the bracket or sleeve 8 is provided with a short arm 14 on the side of the shaft remote from the drum, and on this arm I mount an adjustable counterweight 15 which may be secured at any point desired by means of removable bolt 16. This counterweight is not of sufficient weight to maintain the dead ends of the band pressed against the drum flanges, but is merely used to produce a

"floating" effect in the dead ends; that is to say, the counterweight prevents the loose ends from sagging away off from the drum flanges and also operates to reduce the time in which the band will act after the rock-shaft 10 is rotated to apply the brake.

In order to enable the rotation of the rock-shaft to tighten the bands on the drum, I provide two sleeves 17 and 18 which are secured to the shaft by keys 19, and in order to insure that there will be no possible longitudinal shifting of these sleeves, I provide each sleeve with a set-screw 20 and check-nut 21. The sleeves have short arms 22 which project toward the drum, and each sleeve carries a wrist-pin 23 supported in the arms. In the case of the sleeve 18, I may also support one end of its wrist-pin 23 in a large arm 24 which operates as a socket for an operating lever 25 for rocking the rock-shaft. Suitable means is provided for securing the live ends 26 of the brake-bands to the wrist-pins 23. For this purpose, each band may be provided with a bracket 27 carrying adjustable bolts 28; the lower end of each bolt is formed with an eye through which the wrist-pin 23 is slipped.

I also provide means for counterweighting the lever 25 and the live ends 26 of the band. This may be simply accomplished by providing an adjustable counterweight 29 mounted on an arm 30 from the sleeve 17 and secured adjustably thereto in a manner similar to that described in connection with the counterweight 15. The brakebands are, of course, provided with a suitable liner or wear-strip 31.

With this organization of parts, it will be evident that the brakebands and their connected parts constitute a unitary structure; that is to say, there are no attachments made to the derrick frame. This enables the apparatus to be completely removed when desired in order to effect repairs or adjustments and it can be immediately replaced by another apparatus so that the drum can be kept in operation without unnecessary delay.

One of the advantages of this construction also resides in the fact that the shaft 10 is a plain shaft and does not have cranks or eccentrics or other parts forged upon it. I attain the effect of cranks on the shaft by means of the wrist-pins which are mounted in the sleeves 17 and 18 which may be formed of castings which are very inexpensive to construct.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take and I do not wish to be limited in the practice of my invention nor in my claims to the particular embodiment set forth.

It is obvious that springs may be substituted for the counterweights, if desired.

What I claim is:—

1. In a brake equalizing apparatus, the combination of a drum, a plurality of brake-bands carried by the drum, a rock-shaft having means for rocking the same, means connecting the live ends of the brakebands to the rock-shaft to actuate the bands to tighten them on the drum simultaneously, an equalizer bar connected with the dead ends of the brakebands, and a member loosely mounted on the rock-shaft, connected with the equalizer bar and operating as an anchorage for the dead ends of the brakebands whereby the braking force is distributed between the different brake-bands.

2. In a brake equalizing apparatus, the combination of a drum, a plurality of brake-bands carried by the drum, a rock-shaft having means for rocking the same, means connecting the live ends of the brakebands to the rock-shaft to actuate the bands to tighten them on the drum simultaneously, an equalizer bar connected with the dead ends of the brakebands, and a member loosely mounted on the rock-shaft, connected with the equalizer bar and operating as an anchorage for the dead ends of the brakebands whereby the braking force is distributed between the different brake-bands, and a counterweight carried by the rock-shaft on the side thereof remote from the drum and exerting its force to counterbalance the weight of the dead ends of the bands.

3. In a brake equalizing apparatus, the combination of a drum, a pair of brake-bands carried by the drum, a rock-shaft and operating lever for rocking the same, a sleeve on the rock-shaft corresponding to each brakeband and connected with the live ends of the brakebands, an equalizer bar connecting the dead ends of the brake-bands, and a sleeve loosely mounted on the rock-shaft between the brakebands and connected with the equalizer bar midway between the two bands.

4. In a brake equalizing apparatus, the combination of a drum, a pair of brake-bands carried by the drum, a rock-shaft and operating lever for rocking the same, a sleeve carrying the said lever rigid on the rock-shaft, and corresponding to one of the brakebands, another sleeve rigid on the rock-shaft corresponding to the other brakeband, means connecting the live ends of the brakebands with the sleeves, an equalizer bar connecting the dead ends of the brakebands, a sleeve loosely mounted on the rock-shaft and pivotally connected with the equalizer bar at a point midway between the bands, a counterweight carried by the last named sleeve for substantially counter-

balancing the equalizer bar and dead ends of the brakebands, and a counterweight carried by the rock-shaft and exerting its force to hold the live ends of the brakebands out of contact with the drum.

5. A self-contained brakeband equalizing apparatus, comprising the combination of a rock-shaft, bearings for the rock-shaft having means for attaching the same to a support, a lever for rocking the rock-shaft, a pair of brakebands, means for connecting the live ends of the brakebands to the shaft whereby the rocking of the rock shaft may exert a force in the bands, and an equalizer device connected with the other ends of the bands and anchored on the rock-shaft.

6. In a brakeband equalizing apparatus, the combination of a drum, a pair of brakebands carried by the drum, a rock-shaft with an operating lever for rocking the same, wrist-pins carried by the shaft on the side toward the drum, means connecting the wrist-pins with the live ends of their corresponding brakebands, a counterweight carried by the shaft on the side remote from the drum and operating to hold the live ends of the brakebands out of contact with the drum, and an equalizing device for anchoring the dead ends of the bands.

7. In a draw works, the combination of a hoisting drum provided with a brake having two brake bands, means secured to ends of the bands to adjustably pull and tighten the latter, and an equalizing anchor secured to a stationery support and to the other ends of said bands.

8. In a draw works, the combination of a hoisting drum, two brake drums secured to rotate with said hoisting drum, brake bands embracing said drums, means secured to the ends of said brake bands to adjustably pull and tighten the latter, a cross-bar pivotally secured to said brake bands, and an anchor pivotally secured to said cross-bar between the ends thereof and to a stationary support.

Signed at Torrance, California, this 12th day of May, 1923.

DAVID SMITH.