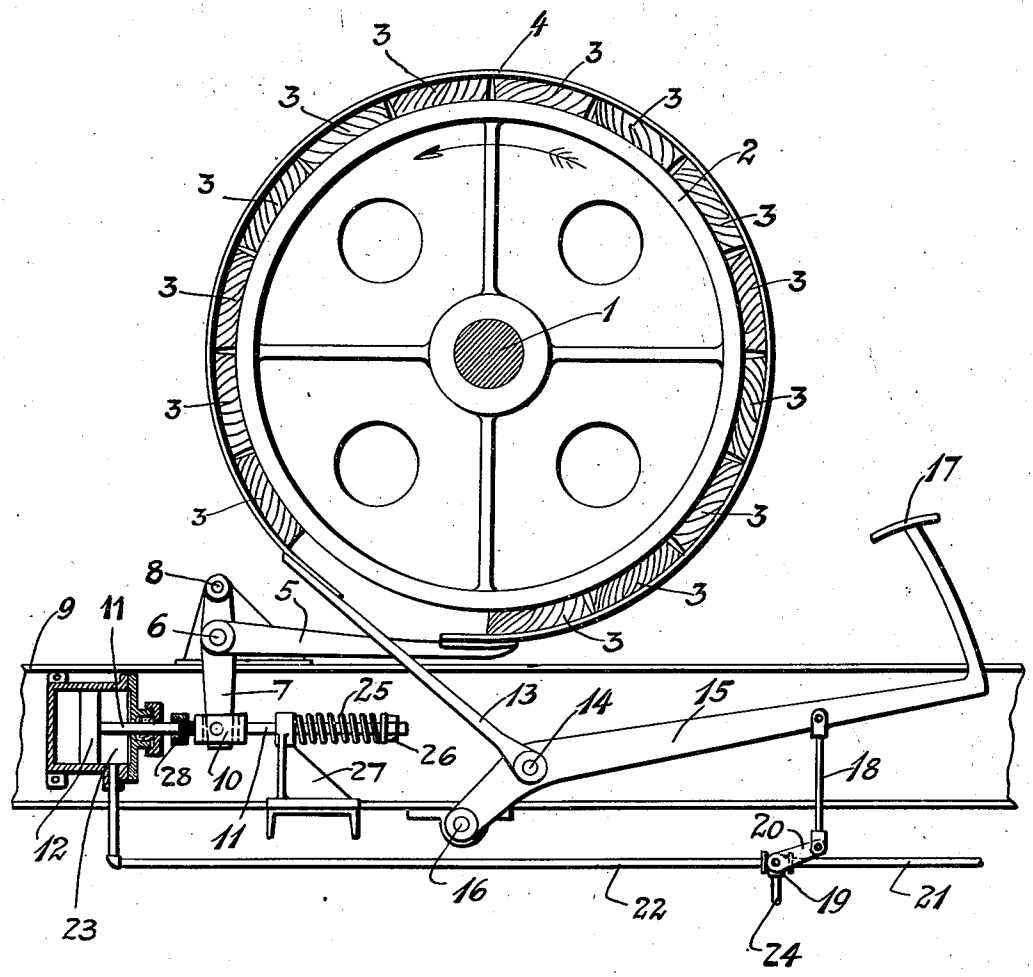
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BRAKE

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BRAKE.

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Our invention relates to new and useful improvements in band brakes, and has for its principal object to provide a means for taking up and releasing the slack in the dead-end of brake-bands.

Heretofore, the chief practical operating difficulty with band brakes, particularly when actuated by a foot lever, has been that so large a part of the travel of the lever has had to be devoted merely to taking up and releasing the slack in the brake-band; thus either requiring a very short lever with consequent loss of leverage, or requiring too much travel of the lever for convenient foot-operation.

A further difficulty has been that the limited play of the brake lever has never permitted a sufficient slacking off of the brake-band to enable adequate cooling of the band between its successive applications, and this fact has resulted in great and undue wear on both band and drum.

It is our object to eliminate these troubles by providing an automatic take-up and release of the slack, so that a very long lever can be employed, the lever being devoted solely to determining the degree of tension in the band. This long lever permits a very delicate control of the braking operation, without undue foot-travel. The automatic take-up and release permits the complete slacking away of the brake-band when not in use, thus providing ample space for cooling currents of air. Other advantages of my design will naturally suggest themselves as the description progresses. It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With these general objects in view, the invention resides in the novel features of construction, combination and arrangement of parts which will be hereinafter more particularly described and claimed, and shown in the accompanying drawing, which is a side view of our apparatus, partly in section.

Referring more particularly to this drawing, it will be seen that 1 represents a cross-section of the shaft to be braked. Keyed to this shaft is a brake-drum 2, in braking contact with which are the blocks 3 of a brake-band 4. The shaft and drum rotate counter-clockwise, as indicated by the curved arrow.

The dead-end 5 of the brake-band, instead of being fixed (as is usual with non-differential band brakes), is pivoted at 6, intermediate the ends of a lever 7, whose fulcrum 8 is fixed in the supporting frame 9.

The other end of the lever 7 is pivoted in a block 10, carried by the piston rod 11 of a piston 12.

The live-end 13 of the brake-band is pivoted (as usual) at 14, intermediate the ends of a foot-lever 15, whose fulcrum 16 is fixed in the supporting frame.

The other end of the lever 15 carries a pedal 17, and a reach-rod 18 which actuates an admission and release valve 19, by means of a crank 20. The words "admission and release valve" are used by us to designate a valve mechanism which operates after the manner of a conventional three-way valve. Steam comes through a pipe 21, the valve 19, and a pipe 22, to the cylinder 23 of the piston 12. This cylinder is carried by the frame 9. The exhaust steam is carried away from the valve 19 through a pipe 24.

A compression spring 25 engages with a nut 26 on the end of the piston rod 11, and with a bracket 27, carried by the frame 9, thus tending to keep the dead-end of the brake-band at all times released.

An adjustable stop 28 is provided, so that the motion of the lever 7, under the influence of the steam, will be just sufficient to take up the slack in the brake-band 4, without applying any braking effect.

It may be seen, from the foregoing description, that the first slight downward motion of the pedal 17 applies steam to the cylinder 23, thus taking up all the slack in the brake-band 4, and so enabling the remaining downward motion of the pedal to be devoted to increasing gradually the tension in the brake-band.

Conversely, upon the upward motion of the pedal 17, the brake-band is gradually slacked off, until finally it is released by the exhausting of the steam and the action of the spring 25, at the last part of the upward motion of the pedal.

The valve 19 is not shown in detail, such

valves being well-known to those skilled in the art.

It is evident that any convenient form of control lever can be substituted for lever 15, and other forms of stop, spring, cylinder, band, etc., be used, any convenient means for taking out the slack be used, provided that this means is separate and distinct from the means which does the final setting of the brake, and many other changes be made, without affecting the spirit of our invention.

We claim:

1. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, brake-controlling mechanism, means controlled thereby for setting and releasing the brake, and separate means controlled by said mechanism for taking up and restoring the slack in the brake-band.

2. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, brake-controlling mechanism, means controlled thereby for setting and releasing the brake by motion of the live end of the brake-band, and separate means controlled by said mechanism for taking up and restoring the slack in the brake-band by motion of the dead end thereof.

3. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, brake-controlling mechanism, means controlled thereby for setting and releasing the brake by motion of the live end of the brake-band, and separate means controlled by said mechanism for taking up and restoring the slack in the brake-band by motion of the dead end thereof, said first named means consisting in a brake-lever.

4. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake by motion of the live end of the brake-band, and independent means for taking up and restoring the slack in the brake-band by motion of the dead end thereof, said last-named means consisting in a fluid operated piston.

5. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake by motion of the live end of the brake-band, and independent means for taking up and restoring the slack in the brake-band by motion of the dead end thereof, said first named means consisting in a brake-lever, said last named means consisting in a fluid operated piston.

6. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake by motion of the live end of the brake-band, and independent means for taking up and restoring the slack in the brake-band by motion of the dead end thereof, said first named means consisting in a brake-lever, said last named means consisting in a fluid operated piston, controlled by a part of the motion of said brake-lever.

7. In a brake, the combination of a rotating brake-drum, a brake-band for frictional engagement with the drum, means for setting the brake, and means for taking up the slack of the brake-band, comprising a fluid-actuated piston, operating on the dead end of the brake-band.

8. Method of setting a brake-band, consisting in first taking up the slack in the band by means associated with its dead end, and then gradually tightening the band by means associated with its live end.

9. Method of releasing a brake-band, consisting in first gradually loosening the band by means associated with its live end, and then slackening the band by means associated with its dead end.

10. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake by motion of the live end of the brake-band, and independent means for taking up and restoring the slack in the brake-band by motion of the dead end thereof, said first named means consisting in a brake-lever, said last named means consisting in a fluid operated piston, controlled by a part of the motion of said brake-lever acting through an admission and release valve.

11. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake by motion of the live end of the brake-band, independent means for taking up the slack in the brake-band by motion of the dead end thereof, said first named means consisting in a brake-lever, said last named means consisting in a fluid operated piston, controlled by a part of the motion of said brake-lever acting through an admission and release valve, and spring means for restoring the slack in the brake band.

12. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake, independent means for taking up and restoring the slack in the brake-band, and adjustable means for preventing such taking-up of slack from producing material braking effect.

13. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-

band for frictional engagement with the drum, means for setting and releasing the brake, and separate means operating to take up and restore the slack in the brake-band during each operation of the brake.

14. In a brake, the combination of a rotating shaft, a brake drum thereon, a brake-band for frictional engagement with the drum, means for setting and releasing the brake, and separate but associated means for taking up and restoring the slack in the brake-band.

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