No. 636,472. Patented Nov. 7, 1899.

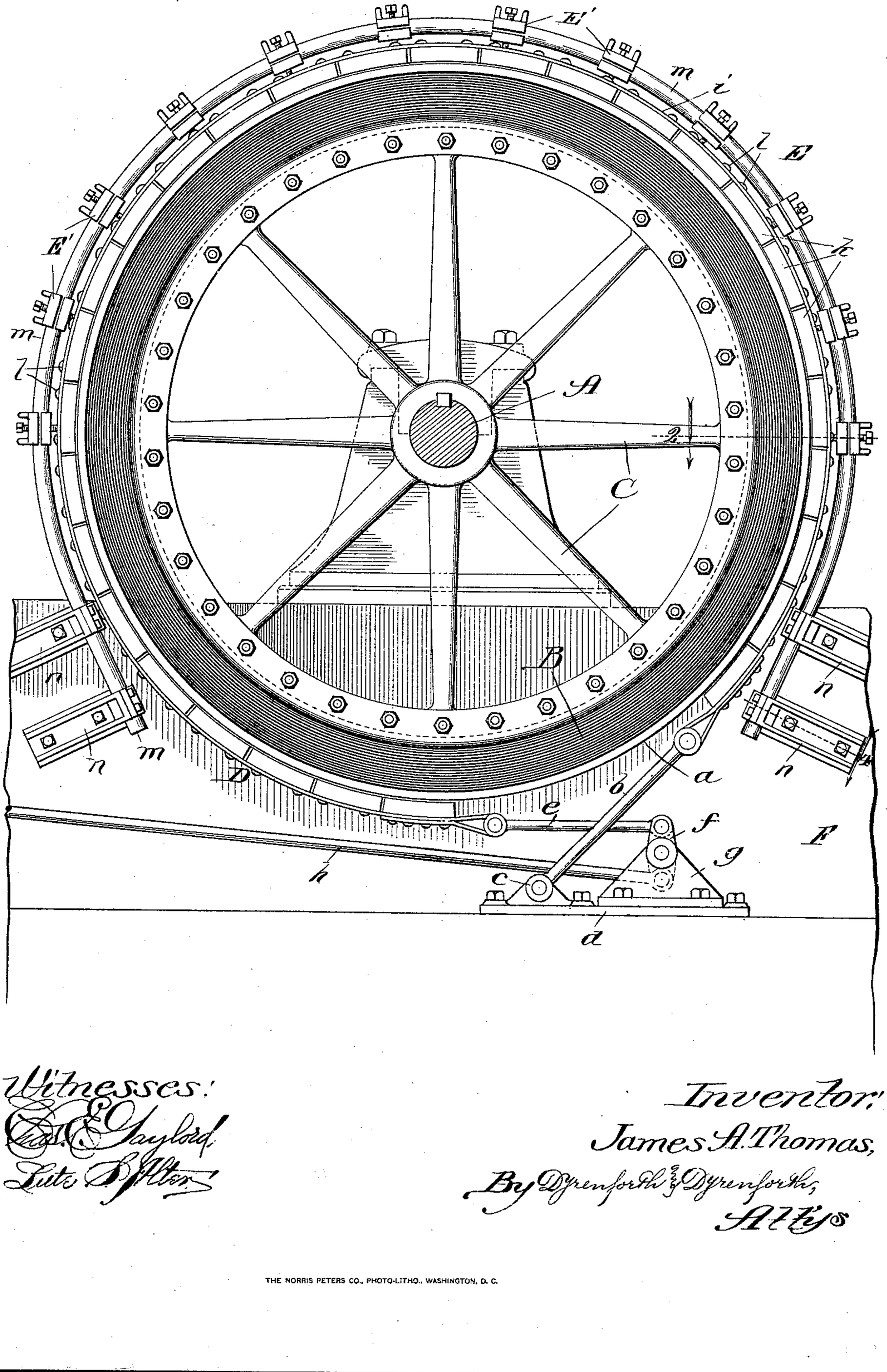
J. A. THOMAS.

BAND BRAKE.

(Application filed Aug. 8, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
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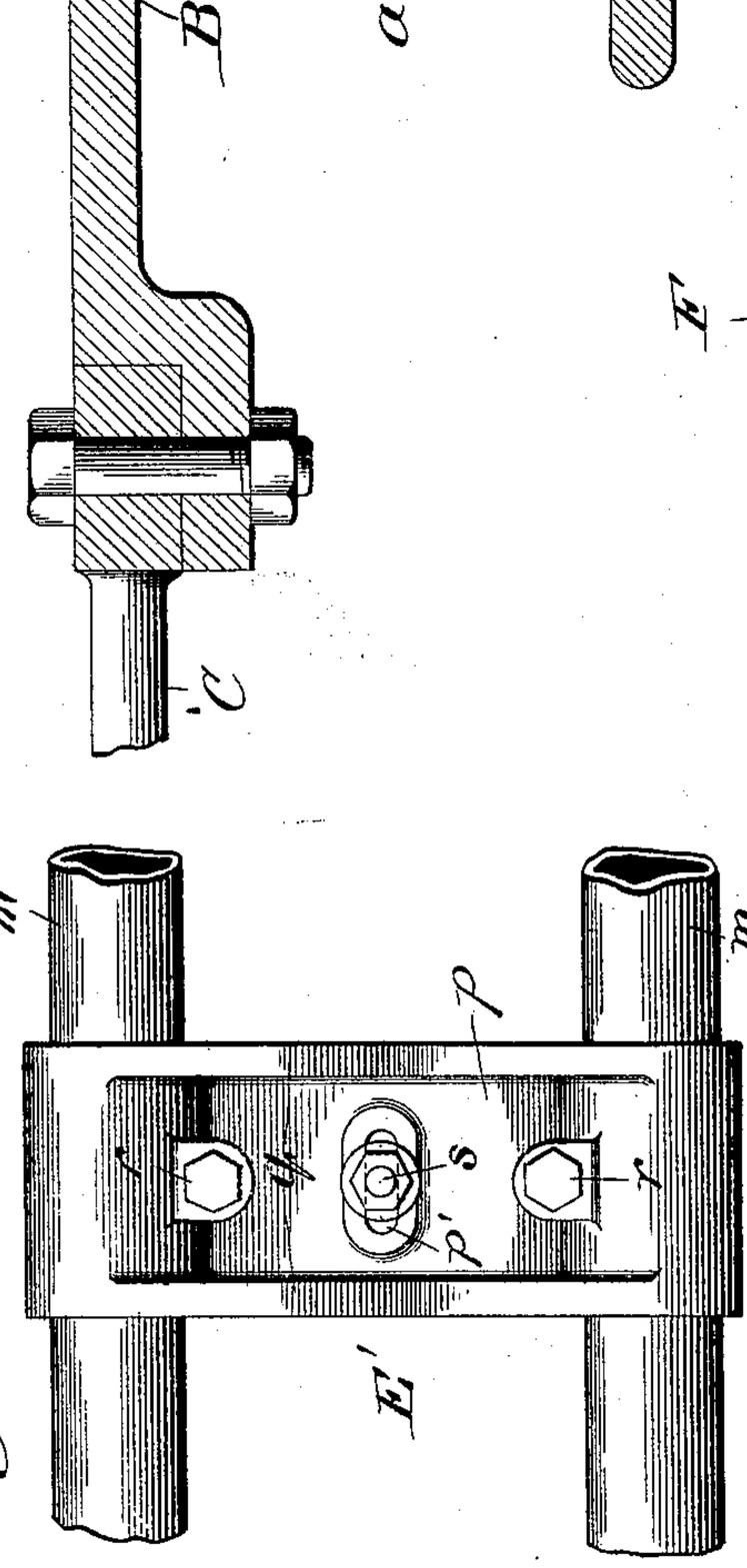

Fig. 2.

Fig. 3.

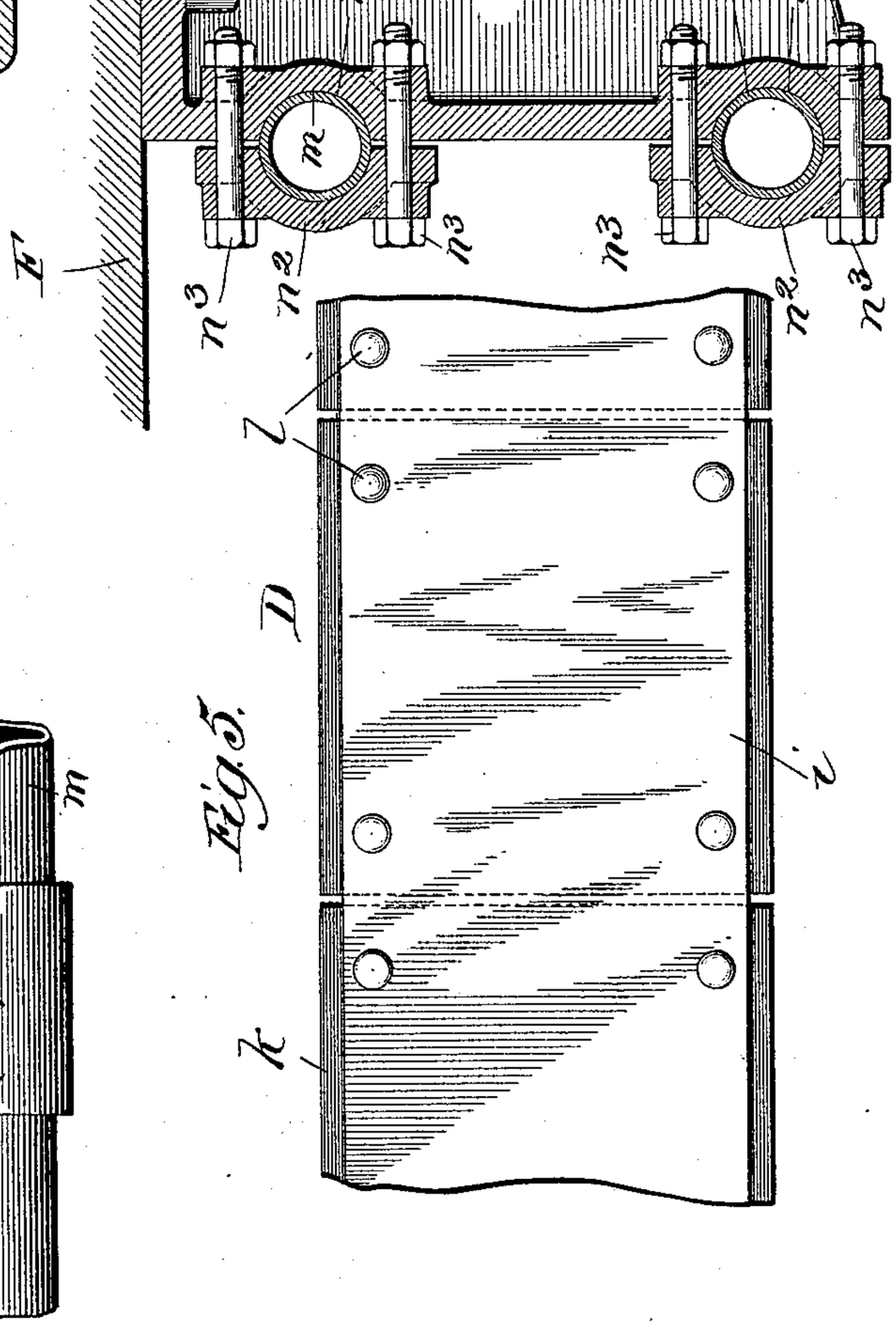

Fig. 4.

Fig. 5.

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636,472

UNITED STATES PATENT OFFICE.

JAMES A. THOMAS, OF CHICAGO, ILLINOIS.

BAND-BRAKE.

SPECIFICATION forming part of Letters Patent No. 636,472, dated November 7, 1899.

Application filed August 8, 1899. Serial No. 726,526. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. THOMAS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Band-Brakes, of which the following is a specification.

This invention relates to improvements in band-brakes generally, though more especially to those of the class employed in connection with the cable-drums of large hoisting-engines for mines. In hoisting-machines of this class the brake is a most important if not indispensable feature, for the reason that it not only forms the safeguard against dropping of the cage in the event of accident to the engine, but is relied upon to a large extent, at least, to control the speed of descent and the stoppage of the cage in the operation of the hoisting-engine.

In the Corliss and other standard types of large hoisting-engines the cable-drum or drum-shaft is provided at one or each end with a brake-wheel or peripheral friction-surface and a band-brake anchored at one end and extending around the brake-wheel to band-tensioning mechanism actuated by a brake-rod under control of the operator. As hitherto commonly provided the band-brake is supported by and in continuous contact with the brake-wheel, whereby the parts are at all times subject to more or less friction, with consequent unnecessary load upon the engine and wear upon the brake.

My object is to overcome the objections to the band-brake as hitherto constructed by providing it with supporting means of improved construction which will hold the brake clear of the brake-wheel when not applied. Incidentally my improved construction will tend to quicken the application and release and prevent sticking of the brake and cause the braking mechanism to be under more perfect control of the operator.

Referring to the drawings, Figure 1 is a broken and partly sectional view, the section being taken across the shaft between the drum and brake-wheel at one end and showing the brake-wheel, band-brake, and the supporting and operating mechanism therefor in side elevation; Fig. 2, an enlarged broken section on line 2 in Fig. 1; Fig. 3, a broken plan view showing a section of the band-brake support; Fig. 4, an enlarged broken section on line 4 in Fig. 1, and Fig. 5 an enlarged broken plan view of the outer side of the band-brake between its points of engagement with the band-brake support.

A is the drum-shaft, and B a brake-wheel, which may be bolted, as shown, to a wheel-center C, keyed to the shaft. The wheel presents an outer circumferential flat friction-surface *a*.

D is the band-brake, pivotally connected at one end with a link *b*, which at its opposite end is pivotally secured to a stationary bearing *c* on an anchor-plate *d*. The band-brake extends from the link *b* around the surface *a* of the wheel and is pivotally connected at its opposite end with a link *e*, connected with a lever *f*, fulcrumed to a bearing *g* on the anchor-plate *d*. The brake-rod *h* is connected with the lever *f*, as shown.

The brake D consists of a preferably flat steel band *i*, lined on its inner face with a series of brake-shoes *k*, consisting of blocks of wood or other friction material, fastened to the band with rivets or bolts *l*.

E is a band-brake-supporting frame, consisting, preferably, of parallel rods or bars *m* *m*, which may be tubes extending over the wheel B and fastened at their ends to a stationary support F, which may be a plumber-block-supporting beam, as shown. The fastening for each end of the support E may consist of a pair of brackets *n* *n*, bolted to the beam F and having recesses *n'* and recessed cap-pieces n^2. The tubes *m* are passed through the openings formed by the recessed brackets and their cap-pieces and secured rigidly in place by tightening the caps with the bolts n^3. Approximately equidistant apart around the support E is a series of resilient connections E'. The connecting-pieces E' consist each of an inner plate *p* and an outer yoke-piece *q*, formed at their ends with recesses, at which they embrace and clamp the tubes *m*, the parts *p* *q* being held together with set-screws *r*, which pass through them, as shown. At the center of each plate *p* is an opening *p'*, elongated in the direction longitudinally of the support. Extending loosely through each opening *p'* is a bolt *s*, suitably fastened at its head portion to the band *i*. Surrounding the

bolt *s* and confined between the plate *p* and a tensioning-nut *s'* on the bolt is a spring *t*.

The support E is stiff and rigid and the springs *t* tend normally to draw the band-brake away from the friction-surface *a* to the stops formed by the set-screws *r*.

The operator applies the brake by drawing upon the brake-rod *h*, and thus contracting the brake-band against the resistance of the springs *t*. The elongated openings *p'* permit the rods or bolts *s* to shift sufficiently in the creeping of the band under the change in direction of strain to prevent binding. The brake is eased off or released by the operator when he relaxes or releases the strain upon the brake-rod. As the brake is applied the springs *t* tend to equalize the centripetal movement and pressure of the brake-band approximately throughout its extent, and the springs tend also to equalize the centrifugal movement and easing off of the pressure of the band as the brake-operating mechanism is relaxed. The effect in practice is to cause the brake to respond quickly to the manipulation of the brake rod and levers, and thus increase its sensitiveness and ease of control by the operator. When the brake is released, the springs *t* move the band-brake to the stops *r*, whereby it is out of frictional contact at all parts with the wheel-surface *a*, permitting the parts to cool off between applications, and thus avoid danger of charring the blocks.

It is desirable that the springs *t* shall be of sufficient stiffness to move the band-brake to release the same without offering more resistance than is necessary to the application of the brake. The tension of the springs may be regulated, as desired, by turning the tensioning-nuts *s'*.

So far as this invention is concerned the function of the wheel B is to provide the drum or drum-shaft with a peripheral friction-surface, and the construction of the wheel may be variously modified so as to form, if desired, an integral part of the drum or drum-shaft.

While I prefer to construct the support E and the resilient connections for the band-brake as shown and described, they may be variously modified in the matter of details of construction without departing from the spirit of the invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the brake-wheel and band-brake extending over the same, of a series of resilient and adjustable supports for the band-brake engaging the same between its ends and tending normally to withdraw it from the wheel, substantially as and for the purpose set forth.

2. The combination with the brake-wheel and band-brake extending over the same, of a supporting-frame extending longitudinally over the band-brake, and a series of resilient and adjustable connections on the frame engaging the band-brake between its ends and tending normally to withdraw it from the wheel, substantially as and for the purpose set forth.

3. The combination with the brake-wheel and band-brake extending over the same, of a supporting-frame extending longitudinally over the band-brake approximately concentric with the wheel, and a series of resilient connections on the supporting-frame engaging the band-brake between its ends and tending normally to withdraw it from the wheel, substantially as and for the purpose set forth.

4. The combination with the brake-wheel and band-brake extending over the same, of a stationary support comprising a bent frame fastened in place at opposite end portions and extending longitudinally over the band-brake, a series of attaching-pieces upon the frame, resilient connections upon the attaching-pieces engaging the band-brake and tending normally to withdraw it from the wheel, and stops on the support limiting the distance of movement of the band-brake from the wheel, substantially as and for the purpose set forth.

5. The combination with the brake-wheel and band-brake extending over the same, of a stationary supporting-frame comprising bent parallel rods fastened in place at opposite end portions and extending longitudinally over the band-brake, a series of attaching-pieces engaging said rods, resilient connections upon the attaching-pieces engaging the band-brake and tending normally to withdraw it from the wheel, and stops on the support limiting the distance of movement of the band-brake from the wheel, substantially as described.

JAMES A. THOMAS.

In presence of—
R. T. SPENCER,
D. W. LEE.