

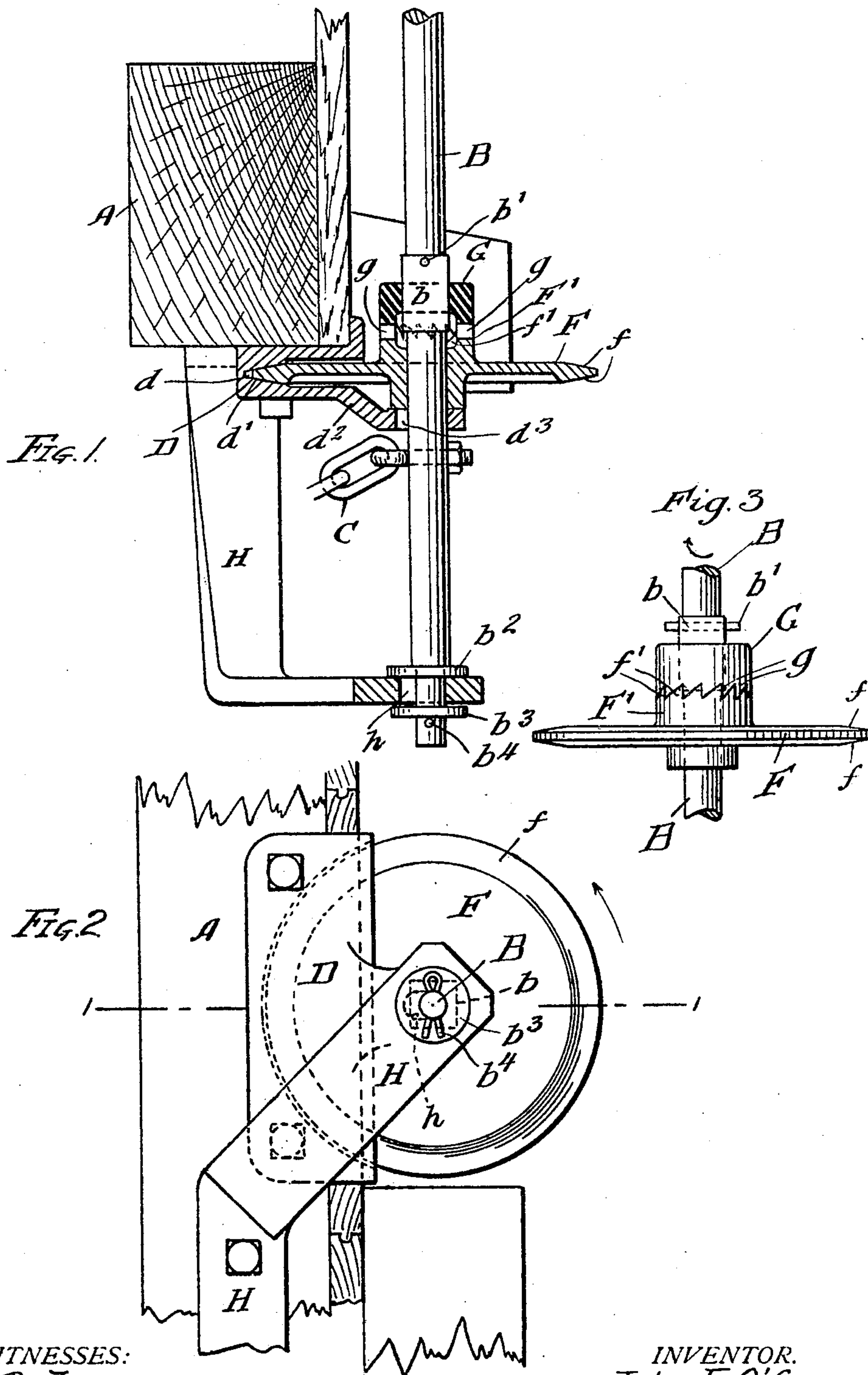
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J. F. O'CONNOR.

BRAKE SHAFT HOLDING AND RELEASING DEVICE.

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WITNESSES:
F. B. Townsend
A. W. Munday

INVENTOR.
John F. O'Connor
 BY *Munday, Swartz & Atwood*,
 his ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN F. O'CONNOR, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. H. MINER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION.

BRAKE-SHAFT HOLDING AND RELEASING DEVICE.

No. 795,363.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed April 6, 1905. Serial No. 254,165.

To all whom it may concern:

Be it known that I, JOHN F. O'CONNOR, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Brake-Shaft Holding and Releasing Devices, of which the following is a specification.

My invention relates to an improvement in devices for holding and releasing the winding-shafts of hand-brakes for railroad-cars, street-cars, or other vehicles.

The object of my invention is to provide a device of a simple, efficient, and durable construction for setting or holding and releasing the winding-shaft for hand-brakes of cars and which will enable the customary ratchet and pawl which requires to be manipulated by the foot to be entirely dispensed with.

My invention consists in the means I employ to practically accomplish this object or result—that is to say, it consists, in connection with the brake-shaft around which the chain is wound to set the brake, of a friction-shoe, preferably of a wedging-grooved form, secured to the stationary car-frame, a friction-wheel having a wedging-faced rim or periphery held in engagement with the friction-shoe by the tension of the brake-chain. The friction-wheel is loose on the brake-shaft and is furnished with a toothed collar on its upper face, and a toothed cap fitting loosely on a squared or non-circular section of the brake-shaft engages the toothed collar of the friction-wheel, and thus locks the brake-shaft to the friction-wheel. The toothed cap may move slightly up and down on the squared section of the brake-shaft to permit the brake-shaft to turn independently of the friction-wheel.

My invention also consists in the novel construction of parts and devices and in the novel combination of parts and devices herein shown and described.

In the accompanying drawings, forming a part of this specification, Figure 1 is a central vertical section of a brake-shaft holding and releasing device embodying my invention, taken on line 1 1 of Fig. 2. Fig. 2 is a bottom view, and Fig. 3 is a detail elevation showing the toothed collar of the friction-wheel and the toothed cap.

In said drawings, A represents the portion of a car-frame or other wheel-vehicle to which my invention is applied.

B is the brake-shaft, and C the brake-chain

connected at one end to the brake-shaft round which it is wound to apply the brakes and at its other end to the brake-lever.

D is the friction-shoe, rigidly secured to the car-frame and furnished with a segmental wedging groove d , having inclined friction or wedging faces d' to engage the corresponding friction-faces f of the friction-wheel F. The friction-wheel F is mounted loosely on the brake-shaft B on the round portion thereof, so that the brake-shaft may turn independently of the friction-wheel. The friction-wheel F has an integral toothed collar F' on its upper face, the teeth f' of which engage the corresponding teeth g on the slidable cap G, which has a squared or non-circular opening and fits on the square or non-circular portion b of the shaft B. A pin b' limits the upward movement of the toothed cap G. The friction-shoe D is provided with an arm or projection d^2 , having a slotted opening or oblong bearing d^3 to receive the brake-shaft, and thus permit it and the friction-wheel F, carried thereby, to move to and from the brake-shoe under tension of the brake-chain C when the brake is applied or being applied. H is a bracket secured to the car-frame and having a similar oblong hole or opening h to afford a bearing for the lower end of the brake-shaft B, which is furnished with collars or washers b^2 b^3 and a key b^4 to hold the brake-shaft in place.

The friction-wheel F is in diameter several times the diameter of the brake-shaft around which the brake-chain is wound in applying the brakes, so that the frictional grip between the friction-wheel F and the friction-shoe D has a multiplied advantage or leverage in resisting the tension of the brake-chain and in holding the brakes applied. This advantage or leverage is further increased or multiplied by the comparatively small angle of the inclined or wedging faces f f' of the friction-wheel and d' d' of the brake-shoe, and this leverage may be readily increased to any desired or necessary extent by simply making the angle of the wedging faces of the friction-wheel and friction-shoe more acute or by still further increasing the relative diameter of the friction-wheel in respect to that of the brake-shaft.

In operation to apply the brake the brake-shaft B is turned by the customary hand-wheel at the top of the car or at its upper end to the right in the usual manner, as indicated

by the arrow on Figs. 2 and 3, the friction-wheel being held stationary by its engagement with the friction-shoe as soon as tension is produced on the brake-chain C, as the tension of the chain tends to draw and hold the friction-wheel in engagement with the friction-shoe by the whole force of the strain on the brake-chain, the sliding or upward movement of the toothed cap G permitting its teeth to ride over the teeth on the collar of the friction-wheel as the brake-shaft turns. After each turn imparted to the brake-shaft by the brakeman the toothed cap G on the square section of the brake-shaft by its engagement with the toothed collar or hub of the friction-wheel holds the brake-shaft from turning while the brakeman gets a new hold on the hand-wheel or lever of the brake-shaft. To release the brake, the brakeman simply gives the brake-shaft a turn to the left. In this movement the friction-wheel turns with the brake-shaft, and the force applied by the brakeman to the hand-wheel or lever of the brake-shaft is aided by the tension of the brake-chain, which tends to rotate the brake-shaft in the same direction. The amount of pull or force applied by the brakeman to release the brake may be regulated by the relative proportioning of the diameter of the friction-wheel to that of the brake-shaft or by varying the acuteness of the angle of the friction-faces on the friction-wheel and friction-shoe. It, if desired, can be made as hard to release as to apply or one-half or one-quarter as much. The principle is that the pressure on the friction wheel or disk against the brake-shoe is the same as the pull or tension on the brake-chain, and the friction between the friction-disk and friction-shoe is, say, twenty to twenty-five per cent. of this and is made to act at a leverage of from four to five times, due to the relative diameters of the friction-wheel and brake-shaft, thus practically balancing the tendency to unwind. The holding power of the friction shoe and disk may be increased to any extent desired by varying the angle of the friction-faces of the disk and friction socket or shoe.

The great advantage of my improvement is that the brakeman may release or set the brake from any position in which he can reach the hand-wheel or operating-lever of the brake-shaft, and he is not compelled to climb out or down and find and operate the customary pawl with his foot. Another advantage of my improvement is that in releasing the brake the brakeman is not subjected to any sudden jerk or movement liable to cause him to lose his balance or his footing. A further advantage in my invention is that it is unnecessary for the brakeman to swing with his entire weight on the hand-wheel to release the brake, as is necessary in the hand-brakes heretofore used, which are held and released by a pawl and ratchet where the brakes are tightly set.

By my invention a steady pull gradually reducing is all that is required to release the brake-wheel. At the same time the brake is held in its set position firmly and securely and with certainty and reliability.

I claim—

1. In a hand-brake for cars or other vehicles, the combination with a brake-chain and brake-shaft, of a friction wheel or disk on the brake-shaft, and a stationary friction-shoe with which the friction-wheel is held in frictional engagement by the tension of the brake-chain, substantially as specified.

2. In a hand-brake for cars or other vehicles, the combination with a brake-chain and brake-shaft, of a friction wheel or disk on the brake-shaft, and a stationary friction-shoe with which the friction-wheel is held in frictional engagement by the tension of the brake-chain, said friction-wheel having a toothed collar, and a toothed cap slidably and non-rotatably mounted on the brake-shaft, substantially as specified.

3. In a hand-brake, the combination with the brake-shaft and brake-chain, of a stationary friction-shoe having a segmental groove with inclined friction-faces, and a friction wheel or disk through which the brake-shaft extends, and having inclined friction-faces at its rim to engage the inclined friction-faces of said friction-shoe, said brake-shaft having a square or non-circular section, a toothed cap slidably fitting on said square or non-circular section of the brake-shaft, and a toothed collar connected to the friction-disk, and adapted to engage said toothed cap to hold the brake-shaft from turning in respect to said friction-disk, substantially as specified.

4. In a hand-brake, the combination with a brake-shaft and brake-chain, of a stationary friction-shoe having a segmental groove with inclined friction-faces, and a friction wheel or disk through which the brake-shaft extends, and having inclined friction-faces at its rim to engage the inclined friction-faces of said friction-shoe, said brake-shaft having a square or non-circular section, a toothed cap slidably fitting on said square or non-circular section of the brake-shaft, and a toothed collar connected to the friction-disk, and adapted to engage said toothed cap to hold the brake-shaft from turning in respect to said friction-disk, a slotted bracket to afford a bearing for the lower end of the brake-shaft, and a slotted arm on the friction-shoe to afford a bearing for the brake-shaft near said friction wheel or disk, and permit the brake-shaft and the friction wheel or disk thereon to move to and from the friction-shoe under tension of the brake-chain, substantially as specified.

JOHN F. O'CONNOR.

Witnesses:

H. M. MUNDAY,
P. ABRAMS.