

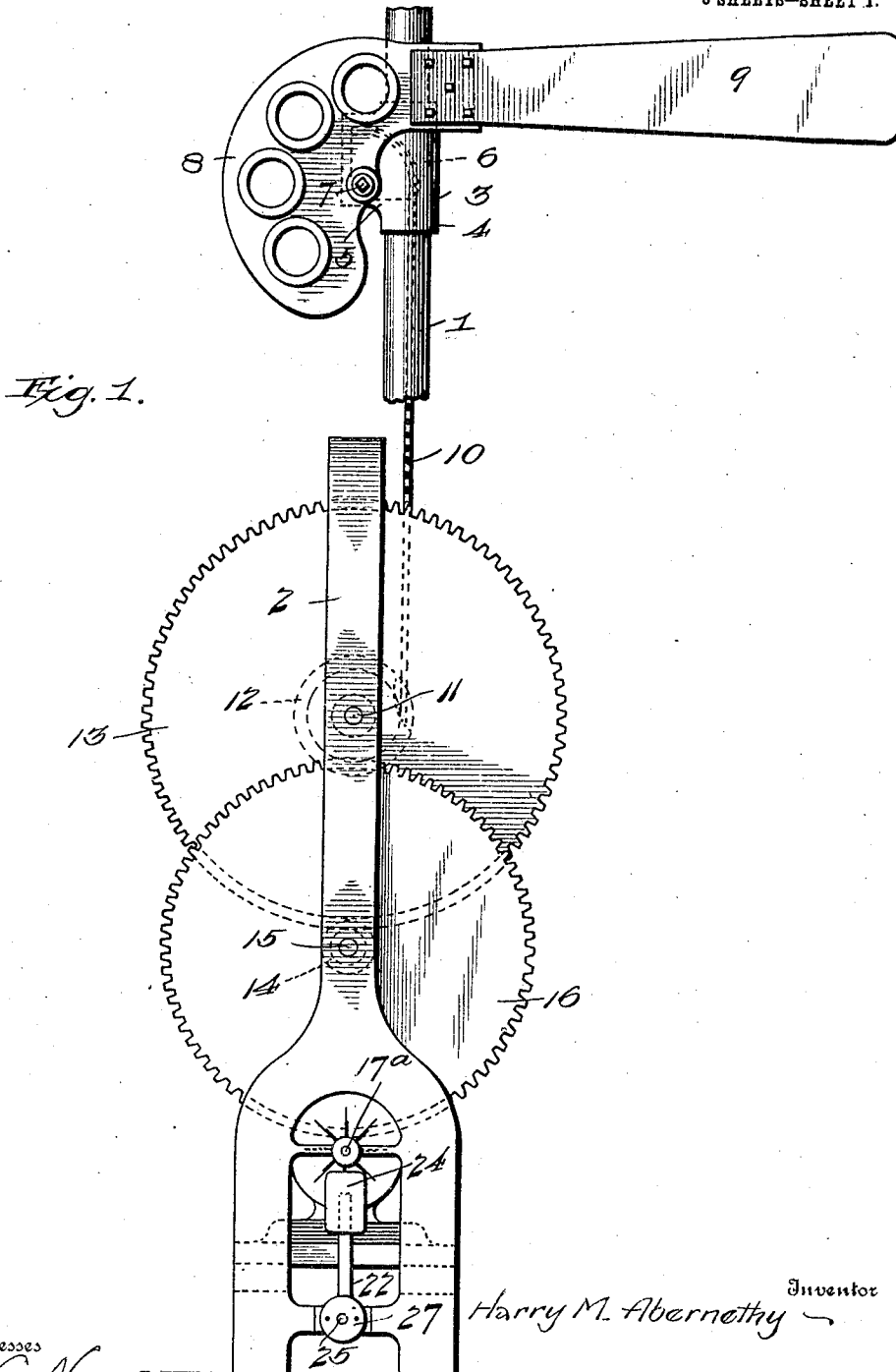
No. 852,093.

PATENTED APR. 30, 1907.

H. M. ABERNETHY.
RAILWAY SEMAPHORE SIGNAL.

APPLICATION FILED DEC. 7, 1905.

3 SHEETS—SHEET 1.



Witnesses

T. A. Kockman
James F. Crown

By

James L. Skidmore
his Attorney

Inventor

Harry M. Abernethy

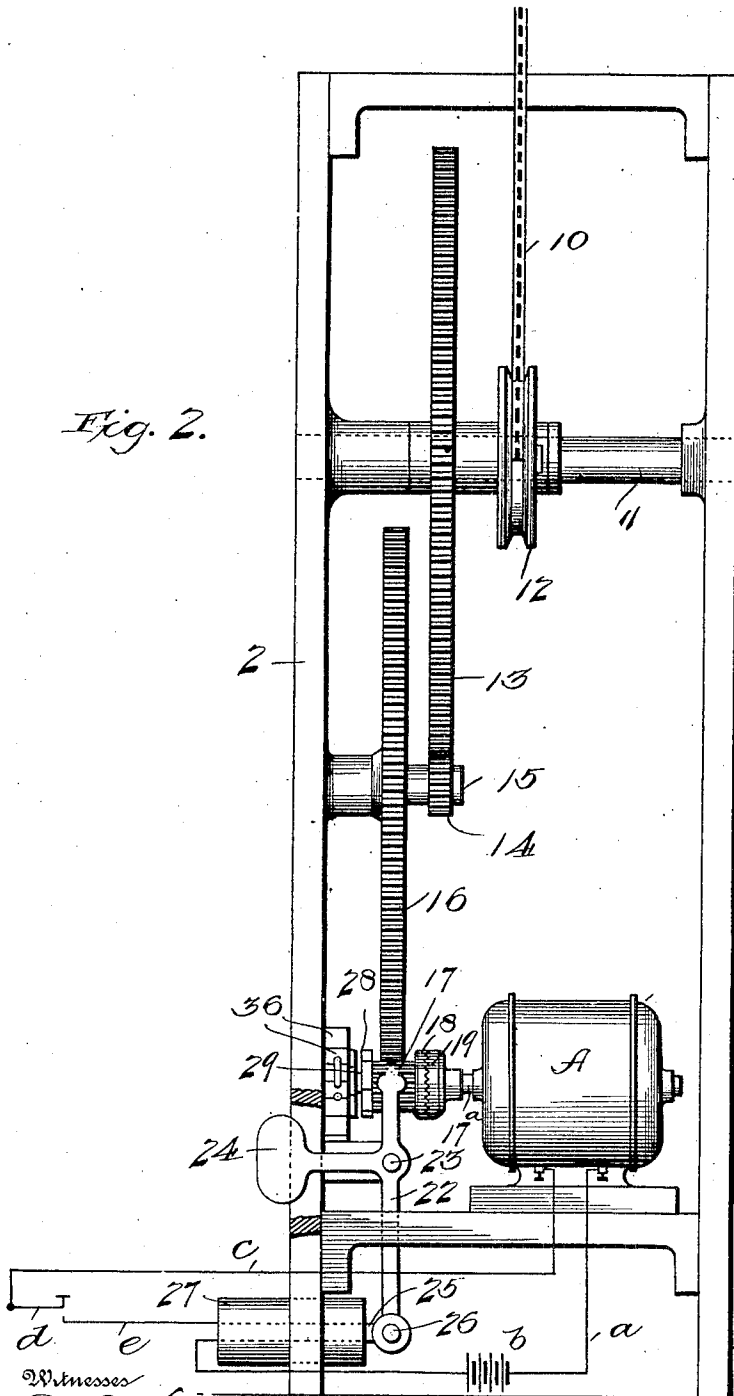
No. 852,093.

PATENTED APR. 30, 1907.

H. M. ABERNETHY.
RAILWAY SEMAPHORE SIGNAL.
APPLICATION FILED DEC. 7, 1906.

3 SHEETS—SHEET 2.

Fig. 2.



Inventor
Harry M. Abernethy

Witnesses
J. L. Ketchum
James F. Brown

By James L. Skidmore
his Attorney

No. 852,093.

PATENTED APR. 30, 1907.

H. M. ABERNETHY.
RAILWAY SEMAPHORE SIGNAL.
APPLICATION FILED DEC. 7, 1905.

3 SHEETS—SHEET 3.

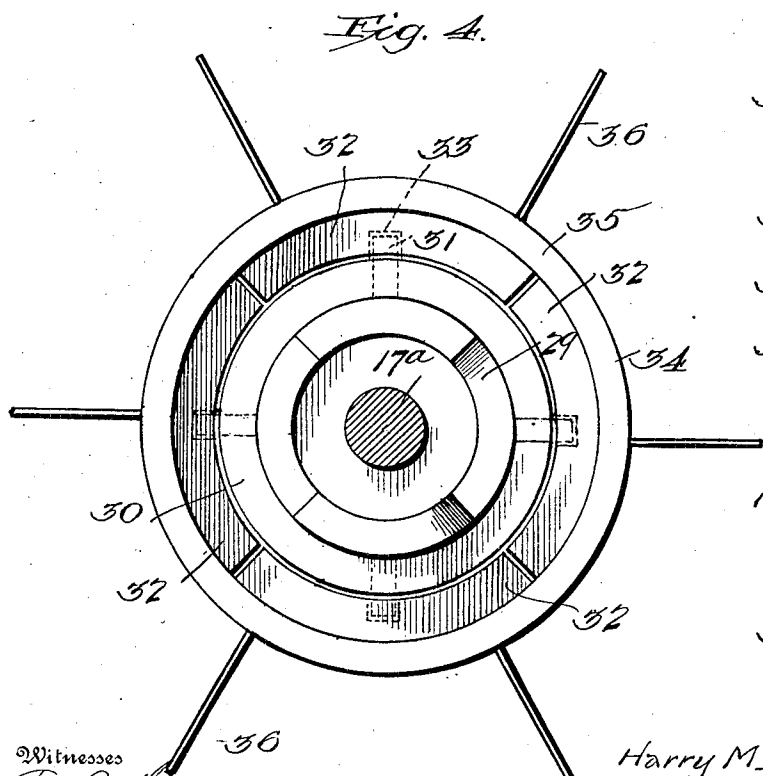
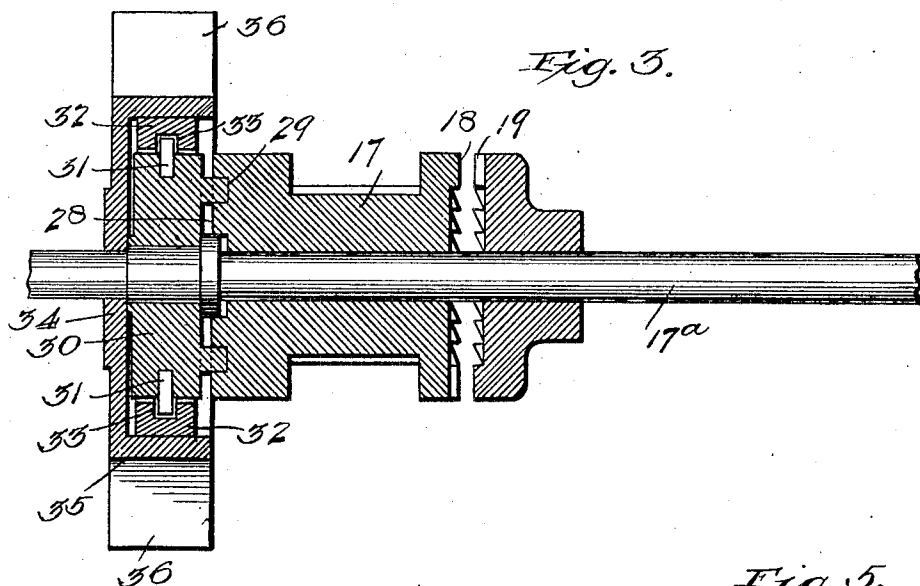
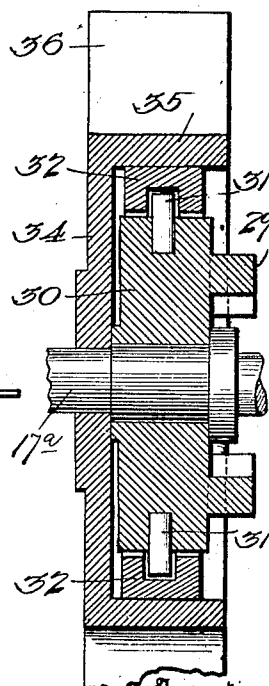


Fig. 5.



Witnesses

T. L. Kocum
James F. Crown

Harry M. Abernethy

By James L. Hedmore
his Attorney

UNITED STATES PATENT OFFICE.

HARRY M. ABERNETHY, OF CLEVELAND, OHIO, ASSIGNOR TO THE
AMERICAN RAILWAY SIGNAL COMPANY, OF CLEVELAND, OHIO,
A CORPORATION OF OHIO.

RAILWAY SEMAPHORE-SIGNAL.

No. 852,093.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed December 7, 1905. Serial No. 290,741.

To all whom it may concern:

Be it known that I, HARRY M. ABERNETHY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Railway Semaphore-Signals, of which the following is a specification.

This invention relates to semaphore signals, and one of the principal objects of the same is to provide efficient and reliable means for preventing the jar or shock incident to the spectacle case and blade when they are brought to a position to give the signals.

Another object is to provide automatic mechanically operated means for retarding the motion of the blade and thus preventing it coming to a sudden stop or jar.

Still another object is to provide a mechanically operated brake mechanism which is automatic in its action and which is to be controlled by the electrical means employed for operating the semaphore, said brake being gradually accumulative in force and effect from its initial movement to its final stopping point.

The means usually employed at present for cushioning the shock or jar of semaphore mechanism comprises a dash-pot, a piston, and a somewhat complicated system of valves which is liable to become inoperative for various reasons at critical periods, and to keep this mechanism in smooth running condition requires constant attention and frequent repairs.

To overcome the defects of the dash-pot and valve system by positively operated and automatic mechanical means which will not require frequent inspection, is one of the desirable objects of my present invention.

The objects and advantages above referred to are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a semaphore signal embodying my invention; Fig. 2 is a front elevation of the brake mechanism and its operative parts; Fig. 3 is a detail sectional view of the brake shaft, the brake, and the shiftable clutch devices; Fig. 4 is a face view of the casing containing the friction brake, on an enlarged scale; and Fig. 5 is a central vertical section of the same.

Referring to the drawings for a more particular description of my invention, the numeral 1 designates a hollow post or mast for supporting the operative parts of the semaphore, and 2 is the casing for containing the brake mechanism. Near the upper end of the post 1, a hollow casting 3 is secured by its tubular extensions 4 fitted to said post and firmly connected thereto. The casting 3 has a laterally extended hollow portion 5 within which a grooved quadrant sheave 6, is mounted upon a squared part of the shaft 7, said shaft being journaled in the two walls of the hollow portion 5, and the end of said shaft projecting out beyond one side of the casting is squared for the engagement of the spectacle case 8. The semaphore blade 9, is secured to the upper projecting end of the spectacle case casting and the weight of this casting is sufficient to overcome the weight of the blade, hence the tendency of the blade to come to a horizontal or danger position is constant. A cable or chain 10 is connected to the quadrant sheave 6, and extends down from said sheave through the hollow post 1 to the brake mechanism.

Journaled in the casing 2 which contains the brake mechanism is a shaft 11, and secured to said shaft is a grooved pulley 12, to which the lower end of the cable or chain 10 is connected. Mounted at the side of the pulley 12, on said shaft 11, is a large gear wheel 13, which meshes with a small pinion 14 on a stub shaft 15, projecting from the inner wall of the casing 2. Formed on or secured to the hub of the pinion 14 is a gear wheel 16, which meshes with a clutch pinion 17, mounted to slide upon and rotate with a shaft 17^a extending laterally from one of the walls of the casing 2. Upon one end of the pinion 17 is a toothed clutch disk adapted to be engaged with a similar disk 19 on the motor shaft 17^a. The clutch pinion 17 is shifted by the three armed lever 22, the upper end of which is enlarged to engage the inner faces of said pinion 17, as shown in Fig. 2.

The lever 22 is pivoted at 23 to a fixed portion of the frame or casing, and upon one of the arms of said lever a weight 24 is formed which normally holds the clutch disks 18 and 19 separated. Upon the depending arm of the lever 22 a solenoid core 25 is pivoted at

26, said core extending into a solenoid 27. Formed on the end of the clutch pinion 17, opposite the disk 18 is a friction face 28 designed to engage the oppositely disposed friction face 29 formed on the outer surface of the brake wheel 30, journaled to rotate freely upon the shaft 17^a. Projecting radially from the periphery of the brake wheel 30 are a number of pins 31, and arranged to move freely outward upon said pins are the segmental brake shoes 32, each provided with a recess or socket 33 into which the pins 31 fit loosely. Surrounding the brake shoes 32 is a casing, 34, loosely supported on the shaft 17^a, and provided with a flange 35, and to said flange is suitably secured a series of fan blades 36. The inner surface of the flange 35 is adapted to be engaged by the brake shoes 32 when they are thrown outward by the centrifugal force exerted by the rapid rotation imparted to the brake wheel 30, whereby the brake wheel, fan and fan blades are caused to rotate together.

From the motor A the conductor wire *a* extends through the battery *b* to the solenoid 27, while the conductor *c* extends from the motor to a key or switch *d* located in an operator's office or tower. From the key *d* the circuit is completed by conductor *e* connected to the solenoid.

The operation of my invention may be described as follows:—The normal position of the spectacle case and blade is at danger, owing to the preponderance of the weight of the spectacle casting 8, and should any defect exist in the connections, such as the breakage of the cable or chain 10, the blade would come to the danger position by gravity. It will be perceived that when the key *d* is operated to complete the circuit and to start the motor, the solenoid 27 is energized and the core 25 is drawn into the solenoid, thus moving the upper end of the lever 22 and shifting the clutch pinion 17 to engage the clutch disks 18, 19 and to pull the chain 10 downward and to move the semaphore arm 9 downward to the safety position. When the blade 9 is depending, or in a vertical plane to indicate safety or a clear track, the clutch disks 18, 19, are in locked condition, and the blade is held in safety position. When the circuit is broken and the solenoid is demagnetized, the upper end of the weighted lever 22 shifts the clutch pinion 17 to disengage the clutch disks 18, 19, and engage

the friction faces 28, 29. The weight of the spectacle frame or case 8 draws the chain 10 upward and rotates the brake wheel 30, rotates the fan blades 36, and throws the brake shoes 32 outward by centrifugal force to retard the motion of the semaphore blade in order to prevent said blade from coming to a too sudden stop when the danger point of the blade is reached. It will be understood that any suitable stops may be provided for limiting the movements of the semaphore blade.

Various changes may be made in the details of construction without departing from the spirit and scope of my invention.

I do not herein claim broadly a fan or pneumatic means for preventing the semaphore blade from coming to a sudden stop since this forms the subject-matter of a separate application filed by me of even date herewith, bearing Serial No. 290,742.

Having thus fully described my invention, what I desire to secure by Letters Patent and claim is:—

1. In a semaphore signal, a friction brake and a revolving fan operated by the movement of the semaphore blade to prevent the jar or shock of the blade in coming to a stop.

2. In a semaphore signal, a centrifugal friction brake and a revolving fan for absorbing the jar of the blade in coming to a stop.

3. A semaphore blade and spectacle case pivotally connected to a support in position to normally assume the danger position, means for moving said blade and case to other positions, means for locking said blade and case in such positions, means for unlocking said locking means, and a friction brake and fan operated by the movement of the blade and case for retarding the motion of said blade and case to prevent the blade from coming to a sudden stop.

4. In a semaphore signal, the combination of a semaphore blade and a spectacle case, means for moving said blade and case in various positions, a friction brake and a revolving fan for gradually retarding said blade and case as they approach the position indicating danger.

HARRY M. ABERNETHY.

In presence of—

H. D. ABERNETHY,
JOHN H. POWELL.