

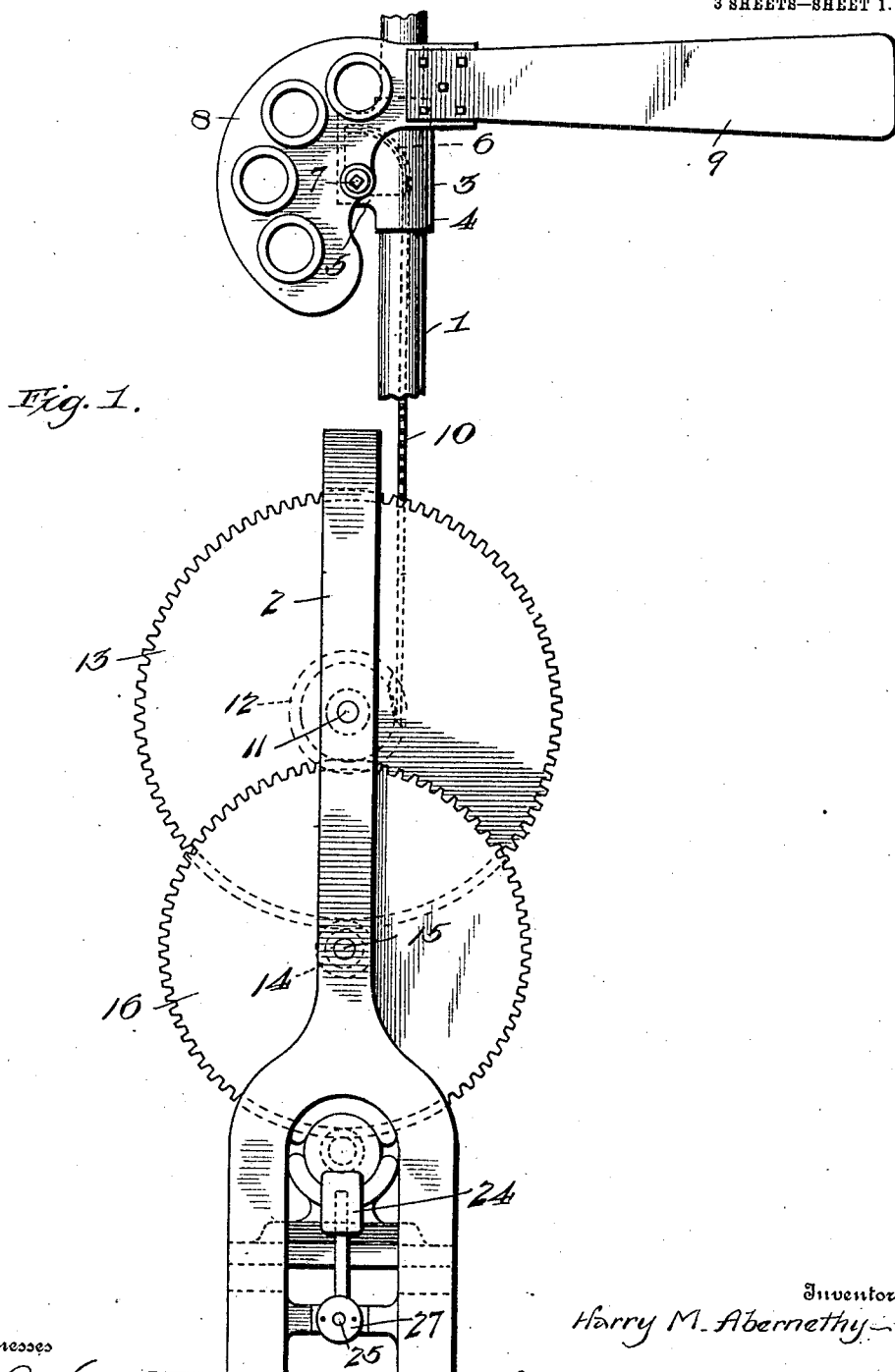
No. 852,092.

PATENTED APR. 30, 1907.

H. M. ABERNETHY.
ELECTRICALLY CONTROLLED SEMAPHORE SIGNAL.

APPLICATION FILED DEC. 7, 1905.

3 SHEETS—SHEET 1.



Witnesses

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James F. Brown

Inventor
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his Attorney

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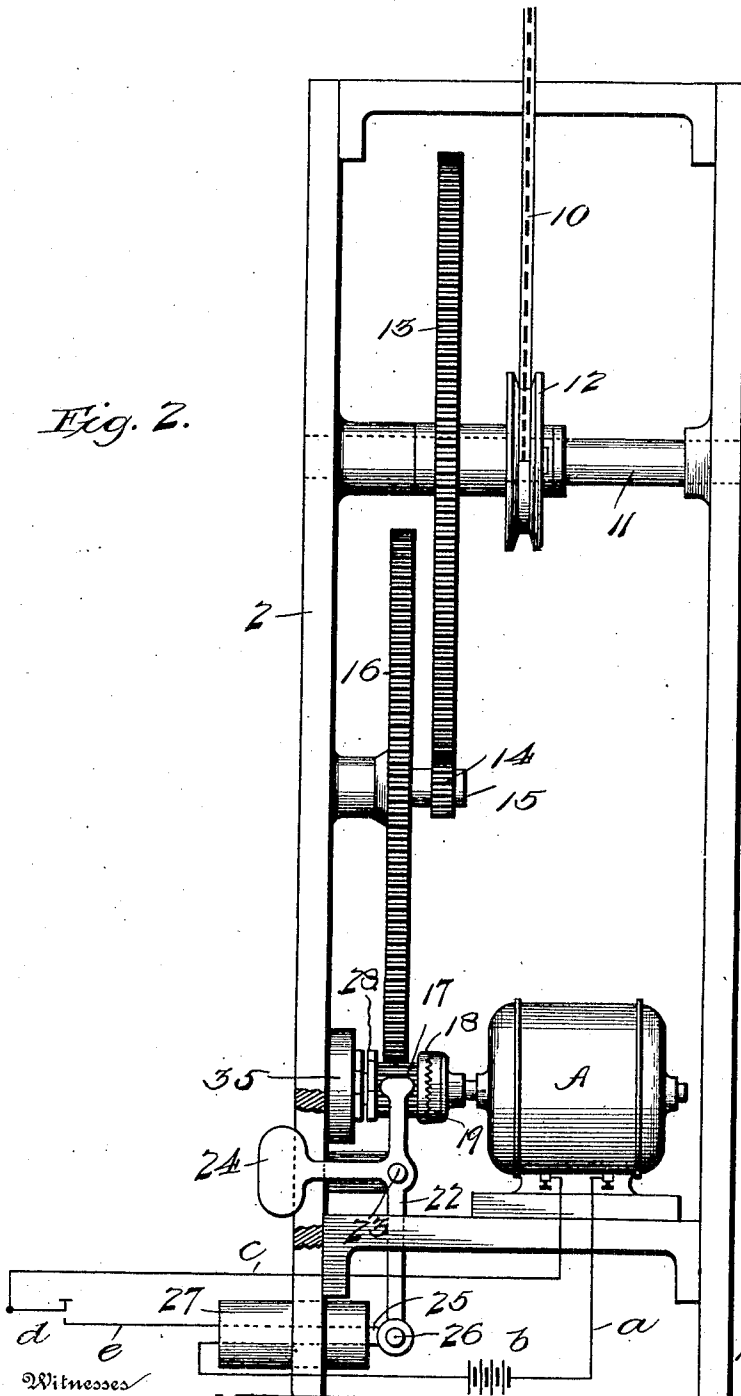
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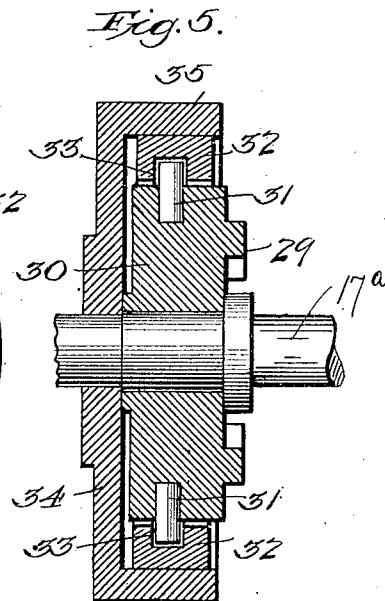
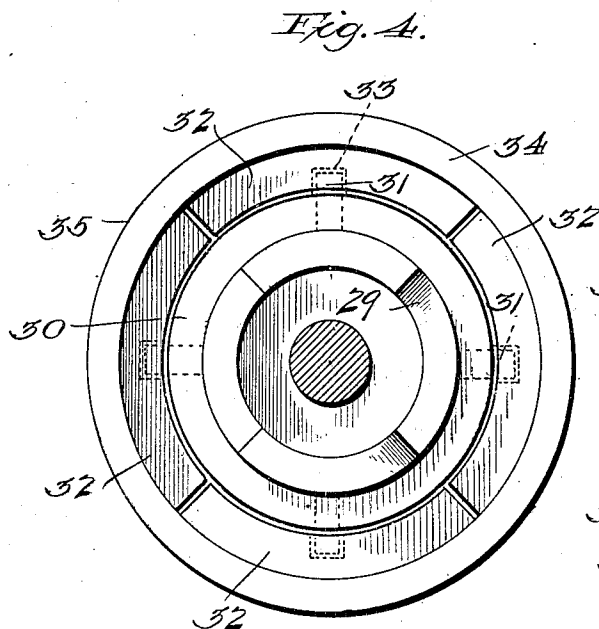
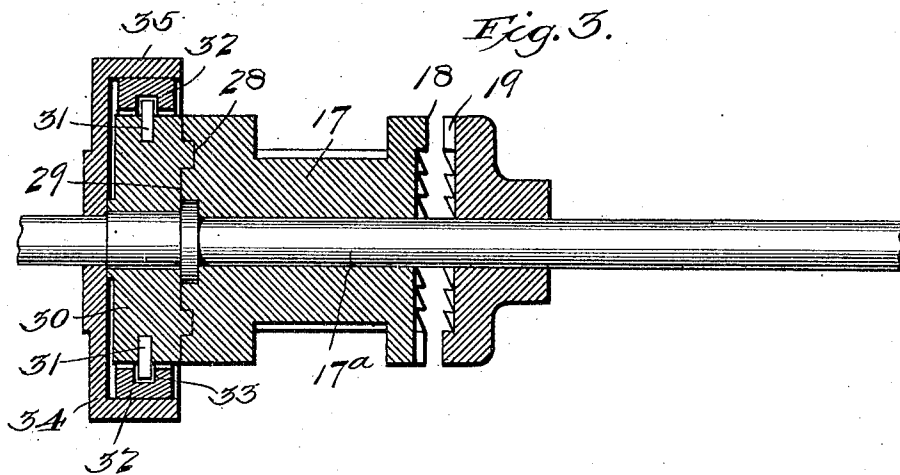
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HARRY M. ABERNETHY, OF CLEVELAND, OHIO, ASSIGNOR TO THE
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ELECTRICALLY-CONTROLLED SEMAPHORE-SIGNAL.

No. 852,092.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed December 7, 1905. Serial No. 290,740.

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 Electrically-Controlled Semaphore-Signals, of which the following is a specification.

This invention relates to electrically controlled semaphore signals, and one of the principal objects of the same is to provide mechanically operated means for preventing the jar or shock of the blade as it comes to a stop in its various positions.

Another object is to provide mechanically operated and automatic means for absorbing the jar or shock of the semaphore blade and spectacle case when the same come to a stop to indicate danger.

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 mechanism being gradually accumulative in effect from its initial movement to its final stopping point.

The means at present employed for cushioning the shock or jar of semaphore mechanism comprises a dash-pot, a piston, and a more or less complicated valve system which is very liable to fail in operation at a critical time. To keep this mechanism in operative condition requires constant inspection and frequent repairs.

To overcome the defects of the dash-pot and valve system by positively operated and automatic mechanical means, is one of the desirable objects of my invention.

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

Figure 1 is a side elevation 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 par-

ticular 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, and within this hollow portion 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 of said walls 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, thus 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 actuating mechanism.

Journalled in the casing 2 which contains said 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. 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 18, adapted to be engaged with and disengaged from a similar clutch 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 the 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 upon the outer surface of a 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, secured to a fixed part of the frame, and provided with a flange 35, the inner surface of which 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 thereto.

From the motor A the conductor wire *a* extends through 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 semaphore blade and spectacle case 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 rise by gravity to danger. 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 in depending or vertical position indicating safety or a clear track, the clutch disks 18, 19 are in locked condition and the blade is held in safety position until the key *d* is operated to break the circuit, and deenergize the solenoid 27. When the solenoid 27 is demagnetized the lever 22 shifts the clutch pinion 17 to engage the friction faces 28 and 29, and disengage the clutch disks. The weight of the spectacle casting or case 8 draws upward on the chain 10 thereby causing the brake wheel 30 to rotate and throw the brake shoes outward by centrifugal force, thus preventing the blade from coming to a too sudden stop when the danger position is reached.

The semaphore blade may be stopped at its various positions by any suitable means.

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

Having thus fully described my invention,

what I desire to secure by Letters Patent and claim is:—

1. In a semaphore signal, a spectacle case and blade, and a rotatable friction brake, comprising a casing and friction shoes therein, said brake being operated by the movement of the spectacle case and semaphore blade to prevent the jar of the blade in coming to a stop.

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

3. In a semaphore signal, a spectacle case and blade, and a centrifugal friction brake, comprising a casing and brake shoes therein for retarding the motion of the spectacle case and blade and preventing the said casing and blade from coming to a sudden stop.

4. In a semaphore signal, a pivoted blade weighted to normally assume the danger position, means for locking the blade in safety position, electrical means for releasing the blade from locked position, and a centrifugal friction brake actuated by the movement of the blade to prevent the blade from coming to a sudden stop.

5. In a semaphore signal, a spectacle case and a semaphore blade pivoted to a support, a quadrant sheave connected to the pivot shaft of said case and blade, a chain or cable connected to said sheave, means connected to said chain or cable for holding the case and blade in different positions, and a friction brake for preventing the jar of the case and blade when coming to a stop.

6. In a semaphore signal, a spectacle case, a semaphore blade connected thereto, a quadrant sheave connected to move, with the blade and case, a flexible connection secured at one end to said sheave, a pulley to which the opposite end of said flexible connection is secured, a friction brake for stopping said blade and case gradually, and means between said pulley and brake for moving the blade and case to different positions.

7. In a semaphore signal, the combination of a hollow post, a hollow casting secured thereto, a quadrant sheave pivotally mounted in said casting, a spectacle case and blade movable with said sheave, a chain or cable connected to said sheave, a pulley to which said chain or cable is connected, a gear wheel mounted on the pulley shaft, a stub shaft, a gear wheel and pinion mounted thereon, a friction brake, a clutch pinion, clutch faces on said clutch pinion, a weighted lever for shifting said clutch pinion, a motor, a clutch

disk on the motor shaft, a solenoid for operating said lever and electrical connections for energizing said solenoid.

5 S. In a semaphore signal, the combination with a pivoted spectacle case and blade, of a friction brake for gradually stopping said spectacle case and blade, said brake compris-

ing a casing having a flange, a brake wheel, brake shoes mounted to move radially thereon, and means for rotating said brake wheel. 10

HARRY M. ABERNETHY.

In presence of—

H. D. ABERNETHY,
JOHN H. POWELL.