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AUTOMATIC SAFETY TRIP FOR ENGINES.

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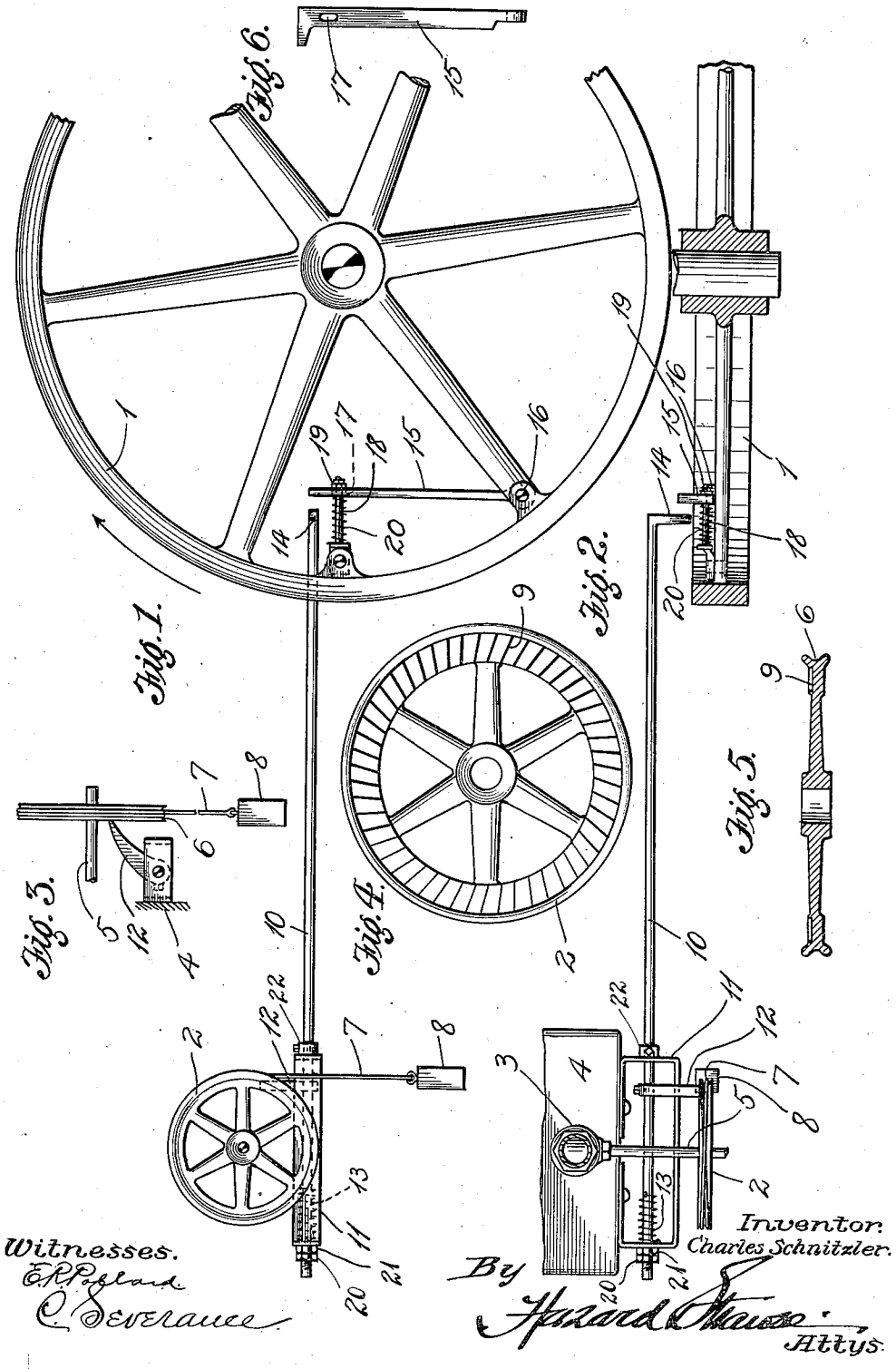

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY-TRIP FOR ENGINES.

1,028,397. Specification of Letters Patent. Patented June 4, 1912.

Application filed February 6, 1911. Serial No. 606,859.

To all whom it may concern:

Be it known that I, CHARLES SCHNITZLER, a citizen of the United States, residing at Oil City, in the county of Kern and State of California, have invented new and useful Improvements in Automatic Safety-Trips for Engines, of which the following is a specification.

This invention relates to improvements in automatic safety trips for engines and it is particularly designed for use in connection with engines that are employed to run certain machinery such as for instance oil well devices where in the event of some trouble or difficulty occurring in connection with the apparatus it is necessary that the engine be slowed down or stopped altogether.

It is an object of the invention to provide a means of the character mentioned, which will be operated by an excessive speed of the engine due usually to the unusual lightening of the load of the engine, whereby the steam supplied will be cut off and the engine stopped.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a fly wheel and throttle valve wheel of an engine, the safety trip device therefor being shown applied to these parts. Fig. 2 is a top plan view of the mechanism illustrated in Fig. 1, the fly wheel, however, being shown in central section. Fig. 3 is an edge elevation of the throttle valve wheel showing the dog used in connection therewith. Fig. 4 is a side elevation of the wheel connected with the throttle valve showing the dog engaging ratchet teeth formed thereon. Fig. 5 is a central sectional view through the said valve actuating wheel. Fig. 6 is a detail view showing the trip lever carried by the fly wheel of the engine.

The features of this invention will now be more particularly described, reference being had to the accompanying drawing, in which—

1 indicates the fly wheel of an ordinary engine 2 the operating wheel of the throttle valve, 3 the throttle valve and 4 a steam chest.

The mechanism forming the subject matter of the present invention is especially adapted to automatically slowing down or stopping an engine, employed in driving certain kinds of machinery and especially oil well boring machinery or similar apparatus. In the event of anything occurring to the apparatus, the engine usually being freed of its load will begin to speed up and will frequently cause damage to some or all of the machinery. The present device is so arranged that such increasing speed in the engine will operate to cut off the steam supply, automatically, and stop the engine.

The throttle valve 3 is provided with the usual valve stem 5 upon which the wheel 2 is secured. The periphery of this wheel is formed with a peripheral groove as 6 upon which a cord or cable 7, carrying a weight 8 may be wound. The cable is wound about the wheel a sufficient number of times, to enable the weight to turn the wheel and the valve carried thereby, so as to cut off the supply of steam from the steam chest 4 of the engine. One side of the rim of the wheel is preferably formed with serrations or ratchet teeth as 9, as clearly shown in Figs. 4 and 5. Mounted adjacent to the said wheel 2 and preferably between the same and the steam chest 4, is a rock shaft 10 which is journaled in a framing 11 usually secured to the steam chest 4. The rock shaft 10 carries a pawl or dog 12 which is so mounted upon the said shaft 10 as to be opposite the ratchet 9 of the wheel 2. When the said dog is moved over into engagement with the ratchet wheel, after the steam has been turned on and the engine put in motion, the weight 8 will hold the wheel against said dog and the parts will remain stationary. A spring 13 is mounted upon the rock shaft 10 and secured at one end of the frame 11, so as to tend to throw the dog 12 away from the wheel 2 as soon as it is freed from the ratchets thereof. The weight 8, however, is sufficiently heavy to overbalance the action of the spring 13 and prevent the dog from being thrown out of engagement with the wheel 2 until the said rock shaft is tripped or turned. The rock shaft 10 is extended from the steam chest to a point opposite a portion of the fly wheel 1, where it is provided with a short lever end 14, turned at right angles to the main stem of the said shaft. The fly wheel 1 is provided with a tripping lever 15, which is pivoted to the said fly wheel as at 16 at one end, while its other ends extend inwardly so as to normally stand in a path, closer to the axis of the wheel than the lever end 14 of the rock shaft 10. The free end of the lever 15 is provided with a slot or aperture 17, which is engaged by a limiting link 18 also carried

by the fly wheel. The lever 15 is retained upon said link by means of suitable bolts 19. A spring 20 surrounding the limiting link 17, normally presses the end of the lever 15 toward the axis of the wheel. The spring 19 is usually of comparatively light tension, but sufficient to maintain the lever 15 in its normal position when the engine is running at its usual speed. If for any reason the engine exceeds its proper speed, centrifugal force will move the lever 15 outwardly, against the action of the spring 20, until its end comes in the path of the lever extension 14, when the rock shaft 10 will be rocked and the dog 12 thrown out of engagement with the wheel 2. In such event the weight 8 will be free to actuate the valve wheel 2 and shut off the steam in the engine.

The operation of the parts will be clearly understood from the above description since the action of each of said parts has been described in setting forth the mechanism. It will be observed that the device, though of a simple character, is positive and effective for the purposes described. In starting the engine it is only necessary, after the same has attained its usual speed and the mechanism driven thereby is operating properly, to throw the dog 12 over into engagement with the wheel 2 and permit the weight 8 to hold the wheel against said dog, in order to set the parts in readiness for automatic action. The rock shaft 10 may be also adjusted longitudinally to a slight extent by means of nuts 20 and 21 applied on the ends thereof and bearing against the frame 11. By loosening the stop collar 22 which is applied to said rock shaft at the other end of the frame, the said nuts may be operated as to draw the lever end 14 of the said rock shaft 10 a little further away from the shaft of the fly wheel when it is desired to require a higher rate of speed in the fly wheel to trip the said rock shaft. An adjustment in the opposite direction will of course permit of the operation of the device at a lower rate of speed as will be readily understood.

What I claim is—

1. A safety mechanism for engines comprising a throttle valve wheel, a dog capable of engaging the same, an elongated rock shaft carrying the said dog and extending to a point near a moving part of the engine, means carried by said moving part of the engine and adapted to be brought into engagement with the said rock shaft when the engine exceeds its normal speed, for permitting of the stopping of the engine.

2. A safety device for engines comprising an elongated rock shaft, a dog carried thereby and adapted to engage the throttle mechanism of the engine, means for holding said throttle mechanism against the dog, and a lever carried by the fly wheel of the engine and operable by centrifugal force for causing its end to move outwardly into position to abut upon said rock shaft and rock the same for disengaging the dog from the throttle wheel mechanism.

3. An automatic engine stopping mechanism comprising a throttle wheel having a roughened inner surface, a rock shaft extending past said throttle wheel and the rim of the fly wheel of the engine and having a dog projecting laterally therefrom, capable of engaging the roughened surface of said valve wheel, a weight mounted upon the said valve wheel and connected therewith by a cable, capable of turning the wheel when released by the dog, a spring tending to rock said shaft when the dog is released from the fly wheel and means carried by the fly wheel of the engine for rocking said shaft and disengaging the said dog when the engine exceeds a given speed.

4. A safety mechanism for engines comprising a wheel connected with the throttle valve thereof, a dog capable of engaging said wheel for stopping its rotation, means for turning the wheel when the dog is disengaged, a rock shaft carrying the said dog, and having a lever projecting therefrom at right angles to its axis of rotation, and a spring pressed lever carried by the fly wheel of the engine and arranged to have its end thereon into the path of the rock shaft lever for abutting against and actuating the same when it is drawn outwardly by the centrifugal force due to excessive speed in the fly wheel.

5. A safety device for engines comprising a longitudinal adjustable rock shaft, a dog carried thereby and projecting at right angles to its rock axis and adapted to engage the throttle mechanism of the engine, means for holding the throttle mechanism against the dog, means upon the rock shaft for affecting its longitudinal adjustment, and means carried by the fly wheel of the engine and operable by centrifugal force for disengaging the dog from the fly wheel mechanism when the engine is to be stopped.

In witness that I claim the foregoing I have hereunto subscribed my name.

CHARLES SCHNITZLER.

Witnesses:
CHAS. NEUMEISTER,
H. L. KELLY.