

M. C. SCHWAB.
AXLE OR SHAFT.
APPLICATION FILED JUNE 6, 1910.

1,003,377.

Patented Sept. 12, 1911.

Fig. 1.

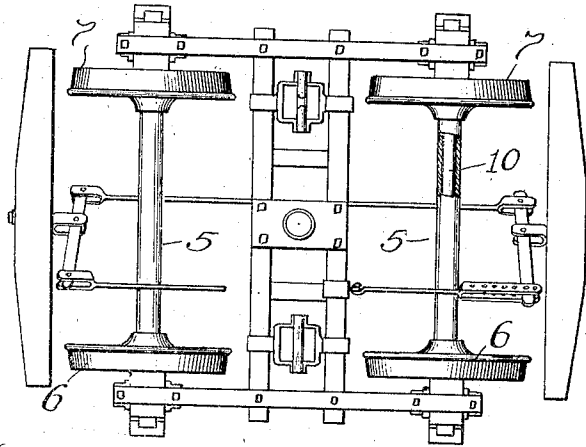


Fig. 3.

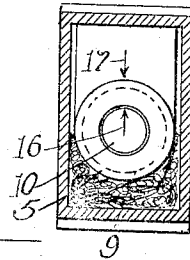


Fig. 4.

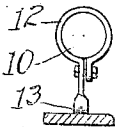
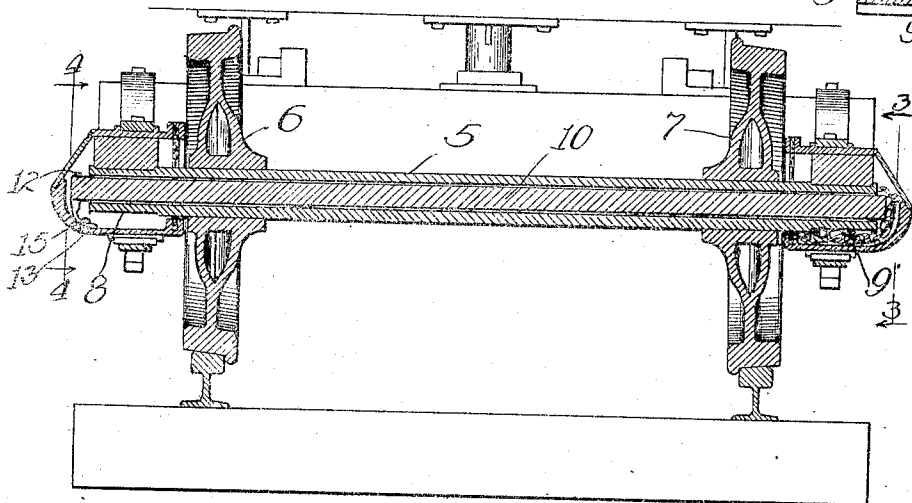


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

MARTIN C. SCHWAB, OF CHICAGO, ILLINOIS.

AXLE OR SHAFT.

1,003,377.

Specification of Letters Patent.

Patented Sept. 12, 1911.

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To all whom it may concern:

Be it known that I, MARTIN C. SCHWAB, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Axles or Shafts, of which the following is a specification.

My invention relates to improvements in axles or shafts, and has especial reference to safety axles for vehicles, such as locomotives, or railway cars.

One of the objects of my invention is to provide in a car, or locomotive truck, a safety axle, which will operate to maintain the parts in substantially their original intact axial positions in the event that the primary axle should become fractured or broken in structure, thereby preventing a wreck of the car or train with which the truck, containing my improved axle, is associated.

Another object of my invention is to provide an indicating device, associated with the working and safety axles, that will readily render obvious the fact that the working axle has become weakened or partially disabled so that repairs may be made before entire disablement of the working axle has occurred.

It is a well known fact that if steel or iron is called upon to bear or to withstand a strain or stress nearly equal to its capacity for a protracted length of time, that it becomes fatigued, and is, for that reason, liable to fracture. The molecules of iron, or steel, of which the axle is composed, become crystallized, or rearranged in a radial direction or other such manner as to cause considerable loss of strength of the iron or steel. This results from hard work or overstrain of the material and sag and finally fracture is liable to be produced by subsequent sudden concussion or extra strain, without warning and without any means for ascertaining the condition of the axle until complete fracture has occurred.

My invention provides a safety axle, to be preferably contained within a hollow, primary axle, and which is not called upon normally to do any of the work that is incumbent upon the primary axle until after the occurrence of weakness or fracture of

the primary axle, so that the safety axle will not be fatigued or crystallized, and is, therefore, well able to withstand the strain impressed upon it in the event of fracture of the primary axle.

In the drawing, Figure 1 is a plan view of an ordinary truck of a railway car; Fig. 2 is an enlarged section through one of the wheels and axle of the truck; Fig. 3 is a section taken on line 3—3 of Fig. 1, showing the indicating device; and Fig. 4 is a section on line 4—4 of Fig. 1 showing a means for holding the safety axle to prevent rotation during normal operation.

5 is a hollow primary axle to which the wheels 6 and 7 are attached at its respective ends. The axle is provided with bearings, 8 and 9. The primary axle is longitudinally hollow, and contains on its inside the secondary or safety axle. In the ordinary operation of the device the safety axle, 10, is held stationary and is not called upon to bear any of the strain or to perform any of the work incumbent upon the primary axle, 5. It lies neatly inside of the primary axle, and no stress or strain is imparted to it, while the primary axle is in operative condition. By this arrangement, I preserve the safety axle in condition free from fatigue and from the effect of crystallization and consequent weakness or deterioration which affects the primary axle.

In the event of partial or complete fracture of the primary axle, the secondary or safety axle will bear the burden and hold the parts in relative positions, so that the car may be safely carried to its destination without danger of breaking down of the axle, and wrecking of the car or train. When the car has reached its destination, a new primary axle may be substituted for the fractured one.

It is desirable that the safety shaft, 10, be held to prevent its rotation. It is also desirable that some means be provided to indicate the fact that the said shaft has been rotarily displaced as evidence that the normally working axle has been partially or wholly disabled so that repairs may be made before the working shaft be wholly incapacitated.

A partial fracture or other weakening of

the working shaft will cause sagging thereof and engender friction between the working and safety shaft sufficient to rotate the latter to a greater or less degree, and thereby indication of such weakened condition may be evidenced by the rotatively displaced condition of the safety shaft.

I provide a clamp, 12, which lightly clamps the end of the shaft, 10, just sufficiently to prevent its rotation during normal operation. The clamp is provided with an extended end, 13, which is secured to a fixed part of the truck as at 14, by the bolt, 15. Abnormal friction between the shafts is sufficient to cause rotation of the interior or safety shaft.

I indicate the rotary displacement of the interior or safety shaft relative to the fixed parts of the frame, by making an indicating mark, 16, shown as an arrow, on the shaft and a similar mark, 17, on a fixed part of the frame. Displacement of the register of marks 16 and 17 will indicate that the marking shaft has been weakened, fractured, or partially fractured, and that immediate repairs should be made. If the damage has been so great as to cause continued rotation of the safety shaft, the friction between the clamp and shaft will engender sufficient heat to ignite the lubricating "dope" within the box and thereby indicate the condition.

While my invention may be used for other purposes than in railway vehicles, it is more particularly adapted for this use as a means for the prevention of the disastrous results that may follow the damage to the primary axle.

Having thus described my invention what I claim is;

1. In combination, a hollow, primary working axle, and a safety, loose idle axle therein, normally having no supporting relation with said working axle.

2. In combination, a hollow, primary working axle, bearings at each end, traction wheels therebetween fixed to said axle, and a safety idle axle within said working axle extending beyond the bearings thereof, and normally having no supporting relation with said working axle.

3. In combination, a hollow primary working axle, a safety idle axle within said working axle, and means for yieldingly restraining said safety loose axle from rotation, normally having no supporting relation with said working axle.

4. In combination, a hollow primary working axle, a safety idle axle within said working axle, means for yieldingly restraining said safety axle from rotation, and means for indicating rotary movement of said safety axle.

5. In combination, a hollow primary working axle, bearings therefor, a safety idle axle within said working axle, and means for supporting said safety axle in event of inability of said working axle to alone sustain its operating load.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

MARTIN C. SCHWAB.

In the presence of—

W. LINN ALLEN,
MARY F. ALLEN.