(No Model.)

W. CAMERER.

Coupling Rod for Locomotive Engines.

No. 235,206. Patented Dec. 7, 1880.

FIG. 1.

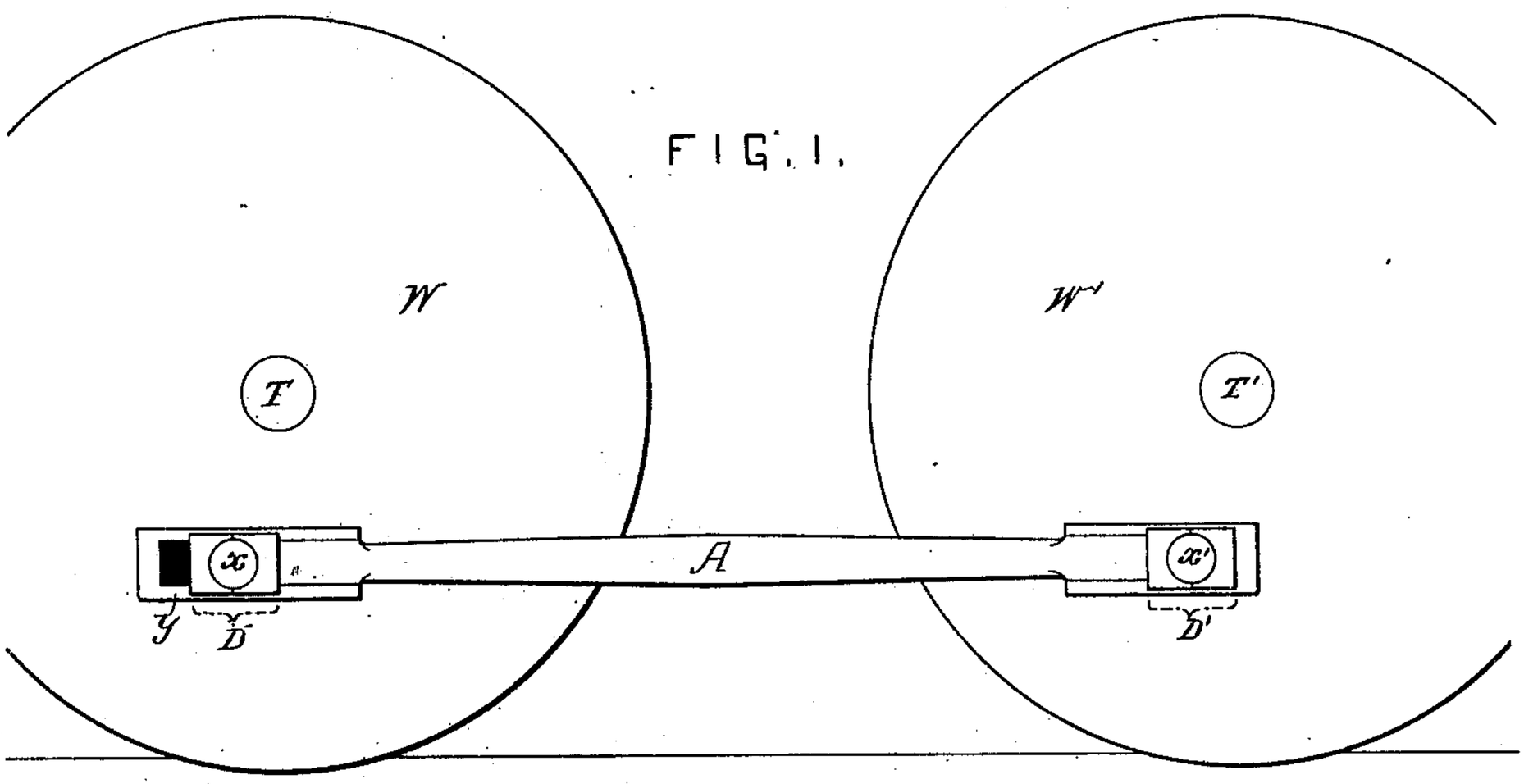


FIG. 2.

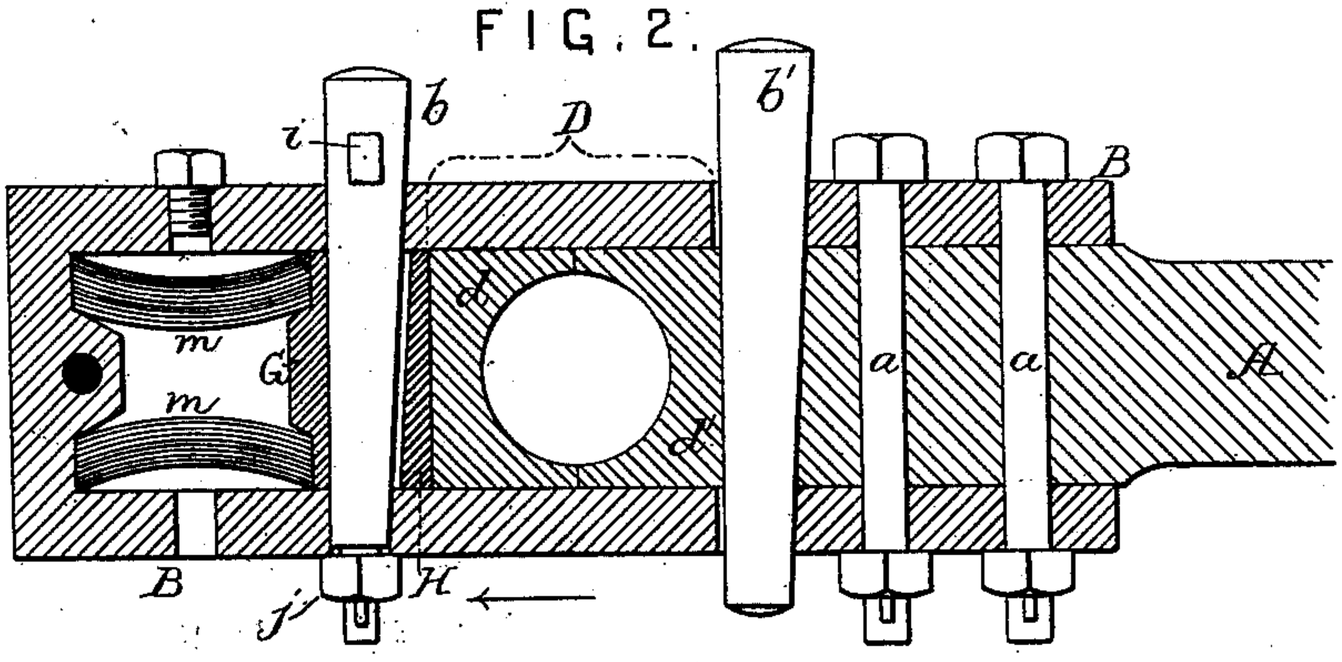
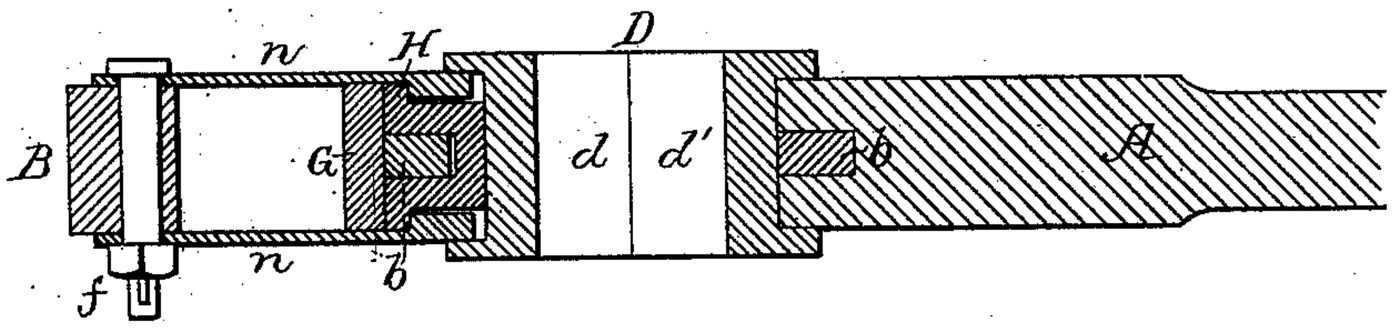


FIG. 3.



WITNESSES

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WILLIAM CAMERER, OF READING, PENNSYLVANIA.

COUPLING-ROD FOR LOCOMOTIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 235,206, dated December 7, 1880.

Application filed October 11, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CAMERER, a citizen of the United States, residing in Reading, Berks county, Pennsylvania, have invented an Improvement in Coupling-Rods for Locomotive-Engines, of which the following is a specification.

My invention relates to the rods of locomotives by which the two crank-pins of two pairs of driving-wheels are coupled together; and the object of my invention is to prevent the breaking of a coupling-rod by interposing between the bearing of one of the crank-pins and the strap a medium possessing such elasticity and such strength that when the coupled wheels are traversing a level track, and the axles are consequently in their normal position in relation to each other, the rod will be as rigid as an ordinary rod; but when an undue strain is imparted to the rod by the rising of one driving-axle above the other the elastic medium will yield, and the rod, while still continuing to perform its functions, will be less liable to break than an ordinary rod.

In the accompanying drawings, Figure 1 is a diagram illustrating my invention; Fig. 2, a sectional view of one stub end of a coupling-rod with my improvements, and Fig. 3 a section on the line 1 2.

The fracture of the coupling-rods of locomotives is a common occurrence and is sometimes attended with serious results. These fractures may, in most cases, be attributed to the fact that while the distance between the centers of the bearings of the rod is always the same, the distance between the centers of the driving-axles, which are coupled together by the rod, will vary to a limited extent, owing to the rising of the axle-boxes of one driving-axle more than those of the other when the wheels are traversing an uneven track, or when they are crossing frogs or switches. The manner in which I overcome this difficulty can be best explained by reference to the diagram, in which I have shown two driving-axles, T T′, and two driving-wheels, W W′, the crank-pins *x x′* being coupled together by a rod, A, in showing which I have omitted the keys and bolts common to rods of this class. The bearing D′ of that stub end of the rod which is adapted to the crank-pin *x′* of the wheel W′ is fixed as in an ordinary coupling-rod; but in the opposite stub end, adapted to the crank-pin of the wheel W, there is between the bearing D and the strap B an elastic medium, *y*, the rigidity of which is such that it will not yield to the power exerted by the engine to drive the wheels; otherwise the rod would not perform the functions of a coupling-rod. The elasticity should be such, however, that when the rising of one axle-box above another subjects the rods to undue tensile strain the medium will yield before the rod will break. In other words, the elastic medium should be so adjusted as to resist somewhat more than the power exerted by the highest pressure of steam carried by the boiler to move the wheels.

It will be understood that the distance between the centers of the bearings of the rod when there is no yielding of the elastic medium is the same as the distance between the centers of the axles when the latter are in their normal positions in relation to each other, and there must be no such yielding of the bearing as to permit a less distance between the centers of the bearings than the distance between the centers of the axles. Hence the elastic medium must always be between the bearing and the end of the strap.

I prefer to carry out my invention in the manner illustrated in Figs. 3 and 4, in which A is part of the coupling-rod; B, the strap fitted to the same; and D, the bearing, made in two parts, *d d′*, in the usual manner. The strap is secured to the enlarged portion of the rod by bolts *a*, and there is the usual taper key, *b′*, and a taper key, *b*, which will be referred to hereinafter.

In an ordinary coupling-rod both bearings are always fixed and unyielding after adjustment, whereas the half *d* of the bearing D in my improved rod is permitted to yield in the direction of the arrow under the circumstances above referred to. The medium which permits this yielding of the half *d* of the bearing consists in the present instance of two springs, *m m*, each composed of several curved plates of steel lodged in the space between the end of the strap and a plate, G, which is fitted snugly in the strap, but can slide to a limited extent in the same, as also can a block, H, the springs forcing the plate against the block,

and the latter against the half *d* of the bearing, which is thus retained in rigid contact with the other half, excepting during the emergencies explained. The plate G and block are maintained in place laterally by side plates, *n n*, which, in the present instance, are held to the strap partly by a bolt, *f*, and partly by flanges of the half *d* of the bearing.

The taper key *b* serves two purposes—namely, that of a bolt, of which the detachable cross-piece *i* is the head, and *j* the nut, and thus performs the same duty as the bolts *a a*—namely, that of confining the opposite sides of the strap. It also serves as a means of reducing the springs to their proper bowed condition in manufacturing and adjusting the rod; but the key must not interfere with the limited movement of the half *d* of the bearing in the direction of the arrow.

It should be understood that I do not desire to limit myself to the use of the key, block, and plate, as other appliances may be used in connection with the yielding medium and the bearing, or the springs may be arranged to act directly on the bearing if the latter is properly constructed to receive the ends of the springs; but I prefer the use of the taper key with the plate and block.

Whatever kind of springs are used, they must be carefully tested so that they will yield only when the tension on the rod is, owing to variations in the distance between the axles, in excess of the force exerted on the rod by the engine to move the wheels. The extent of the variation in the distance between the axles is always trifling, but is sufficient in many cases to cause the fracture of an ordinary rigid rod; hence my invention, by which the rod is made self-accommodating to the said variation in the distances between the axles.

I am aware that the patent of Levi Bissell, No. 7,357, May 14, 1850, shows a pitman or connecting rod in which elastic mediums are used in contact with the bearings for lessening the effects of shocks. This therefore I do not claim; but

I claim as my invention—

1. The combination, in a coupling-rod for locomotive-engines, of a bearing with an elastic medium interposed between the strap and bearing, and adjusted to yield only under a force in excess of that exerted by the engine on the rod, all substantially as set forth.

2. The combination of the rod A, strap B, and springs *m m*, consisting of layers of bowed plates of steel, and lodged between the bearing and strap, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM CAMERER.

Witnesses:
JAMES F. TOBIN,
HARRY SMITH.