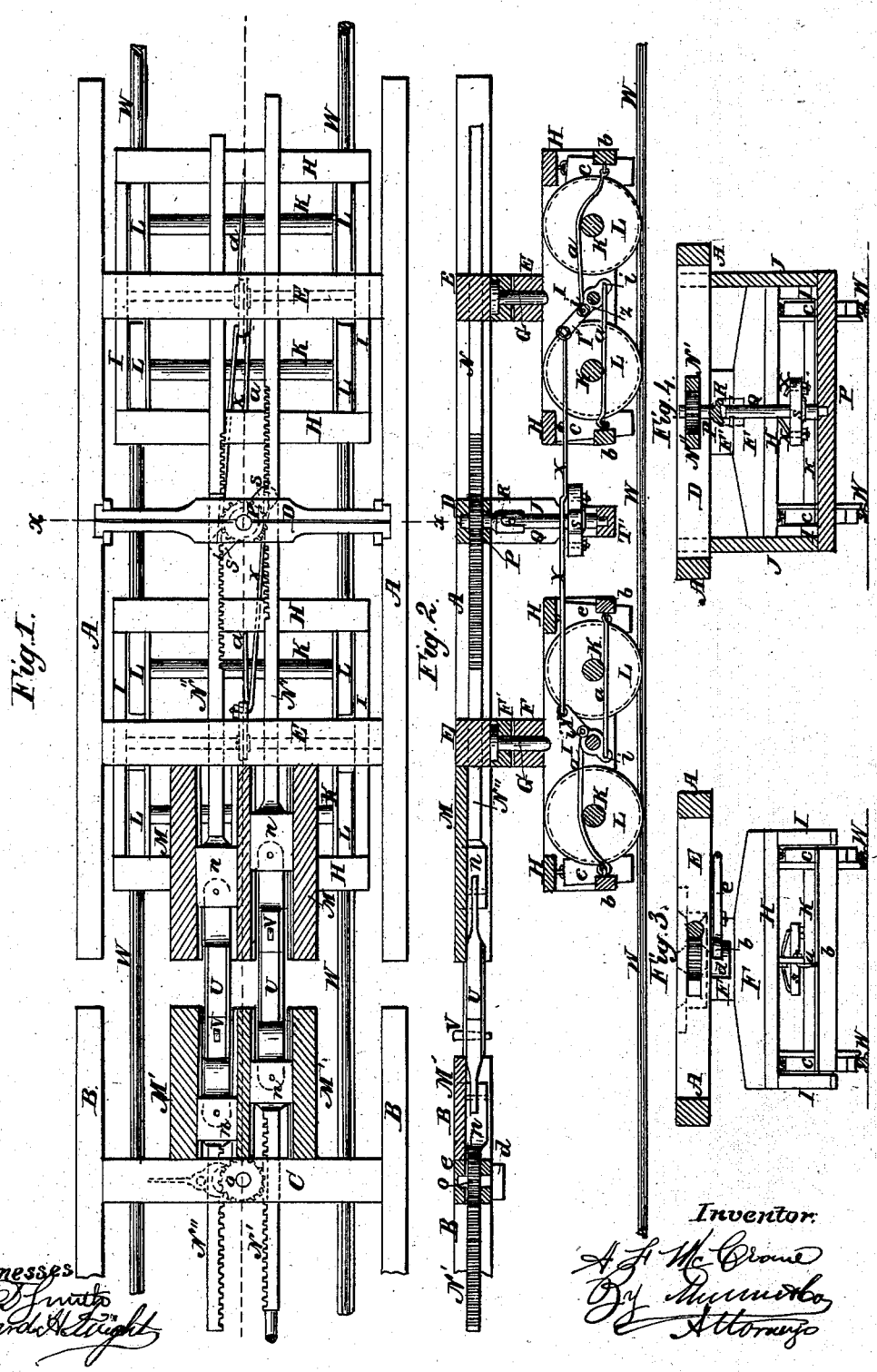
A. F. McCRONE.

Car Brake.

No. 47,440. Patented Apr. 25, 1865.



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ALEXANDER F. McCRONE, OF ELLICOTT'S MILLS, MARYLAND.

IMPROVEMENT IN RAILROAD AIR-BRAKES.

Specification forming part of Letters Patent No. **47,440**, dated April 25, 1865.

To all whom it may concern:

Be it known that I, ALEXANDER F. McCRONE, of Ellicott's Mills, Baltimore county, State of Maryland, have invented a certain new and useful Improved Steam-Brake and Car-Coupling; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan of the same. Fig. 2 is a longitudinal vertical section. Fig. 3 is a front end view. Fig. 4 is a transverse section in the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to provide a brake mechanism which shall be operated by steam from an apparatus on the locomotive and under the control of the engineer, by which a series of bars, united by connecting-links between the cars and running the whole length of the train, shall by suitable mechanism be made to operate the series of brakes through the whole length of the train. This is accomplished by means of two rack-bars on each of the cars, gearing into a pinion in the central transverse timber of each car-frame, and connected to the similar rack-bars of the other cars, and utimately to the locomotive, by means of coupling-bars suitably jointed, so as to make a connection the whole length of the train. One of these bars is connected to a piston working in a cylinder on the locomotive, so that it can be longitudinally projected or withdrawn, which has the effect of rotating the pinions, which are engaged by the racks, and through them operating a system of levers and connecting-rods, which draw the rubber-blocks against the peripheries of the wheels. This may serve as a sketch of the main features of the invention, leaving it to be fully detailed under that section of this specification which treats of the operation.

To enable others skilled in the art to make and use my invention, I will proceed to give a description of it.

A A are the longitudinal timbers of the car-frame, united by transverse timbers E E D, the latter being the central one, which carries the pinion P, which will be ascertained to be the point of draft of the car before I get through.

B B C represent a portion of the frame of the locomotive, or its tender, in the transverse beam being located a pinion, O. The car-frame is supported upon two trucks, a description of one of which will answer for both, as they are counterparts and differ in nothing particular from the ordinary trucks, excepting in the brakes and the apparatus for working them. Each consists of a frame, H I, supporting a cross-timber, F, and in turn supported by the wheels I, whose axles K run in boxes in timbers I. The transverse timbers F on the trucks are underneath the transverse timbers of the frame, with interposed blocks F, washers, and king-bolts G, as usual.

The above may serve as a description of the frame and running-gear, and I will now describe the brake mechanism and the coupling.

M M′ are slides which work the blocks *n*, which form the terminations of the rack-bars N N′ N″ N‴. The bars N N′ and the bars N″ N‴, respectively, are coupled together by the coupling-bars U U, which are keyed (V) or otherwise fastened to them, giving a sufficient degree of flexibility in turning curves and to allow for the jumping of the cars. These bars in each case extend the length of the car to which they belong, and connect with those of similar character on the next car, and so on through the length of the train. A portion of their mid-length is furnished with cogs, which gear into the pinion P, which, as has been observed, is located in the transverse timber D, midway of its length, and is mounted on a shaft, R, which connects by a vertically-adjustable joint with the shaft Q, which is stepped into the cross-timber P′, the latter being suspended by pedestals J from the timbers A of the frame. Rigidly attached to the shaft Q is a vibrating cross-head, S, connected by rods X X with a lever, Y, pivoted at Z to a shaft which rotates in bearings in the side pieces, I, of the truck-frame. Rods *a a*, connected at points *i* with the said lever and with the rubber-bar *b*, bring the rubbers *c* against the wheels L, when the requisite motions are imparted by means presently to be described.

d is a ratchet-wheel on the frame B B C, and *e f* is a pawl and bar, which by suitable

manipulations retains the pinion O at a definite point and the brakes in the corresponding position, whatever that may be.

The operation is as follows: Steam being admitted upon the piston at the end of the rod N′ forces the latter toward the rear, rotating the pinions O and P and every other pinion of corresponding character and position through the length of the train. This motion throws forward all the bars N″ N″ of the series, as they also gear for a portion of their mid-lengths with the pinions. The motions thus described have no effect to change the relative positions of the cars, which still, as before, are attached by means of the rack-bars and couplings, which form a double series with teeth facing inward, and drawing the cars by the engagement of the rack-teeth with their pinions O P, &c. The motion forward or rearward has no effect on the draft either one way or the other, as far as the actual motion or connection is concerned, but the revolution of the pinion P (and what is true of this is true of each car) rotates the cross-head S, draws upon the rods X X, vibrates the pivoted lever Y Y, and draws upon the rods *a a*, and through them brings the rubber-bars *b* toward each other, and the rubbers *c* against the periphery of the wheels. As the pivoted levers Y Y are revolved, raising the rods X X, the shaft Q has the power of raising to allow the rods X to maintain their horizontal position.

The operation of checking the cars by the means thus described will not be accompanied by the surging of the cars one against the other while stopping and starting, and the inconvenience will be reduced to its minimum, which would merely sway the person a little forward or backward, unaccompanied by jar.

Having thus fully, clearly, and exactly described the nature, construction, and operation of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The coupling and brake operating bars extending through the length of the train, and operated by the steam from the engine to rotate the pinions, to whose shafts are attached the cross-heads, which connect by suitable rods and levers with the rubber-bars, the whole described arrangement being constructed and operated substantially as described.

The above specification of my combined steam-brake and car coupling signed this 7th day of February, 1865.

ALEXANDER F. McCRONE.

Witnesses:

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EDWARD H. KNIGHT.