R. GRANT.

CONSECUTIVE SELF REGULATING TRAIN OF RAILROAD CARRIAGES.

No. 999. Patented Nov. 3, 1838.

Fig. 1

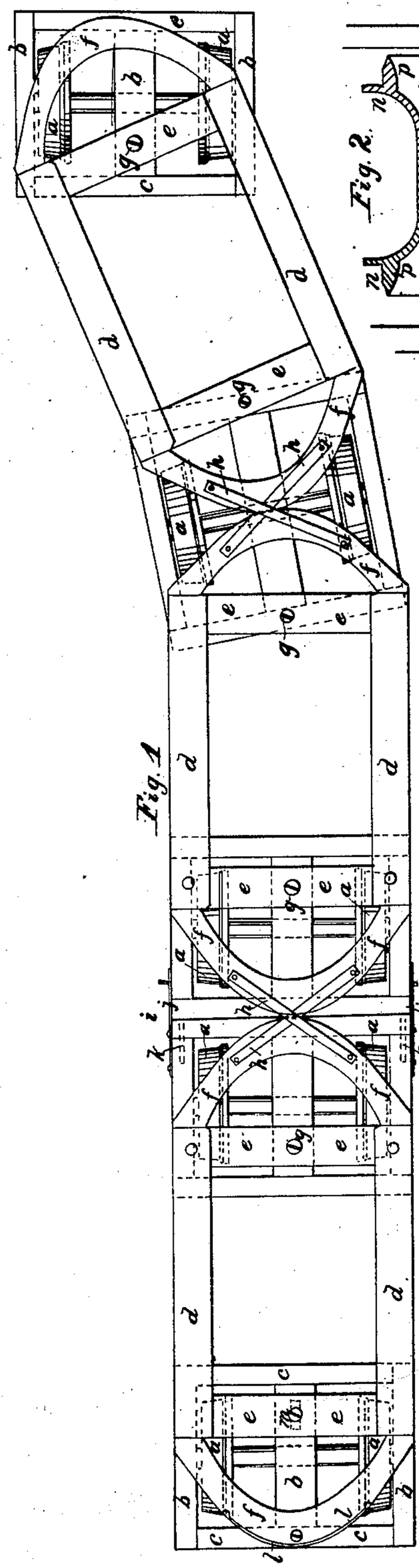


Fig. 2.

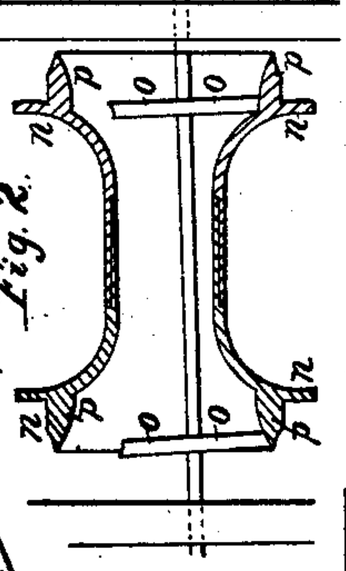
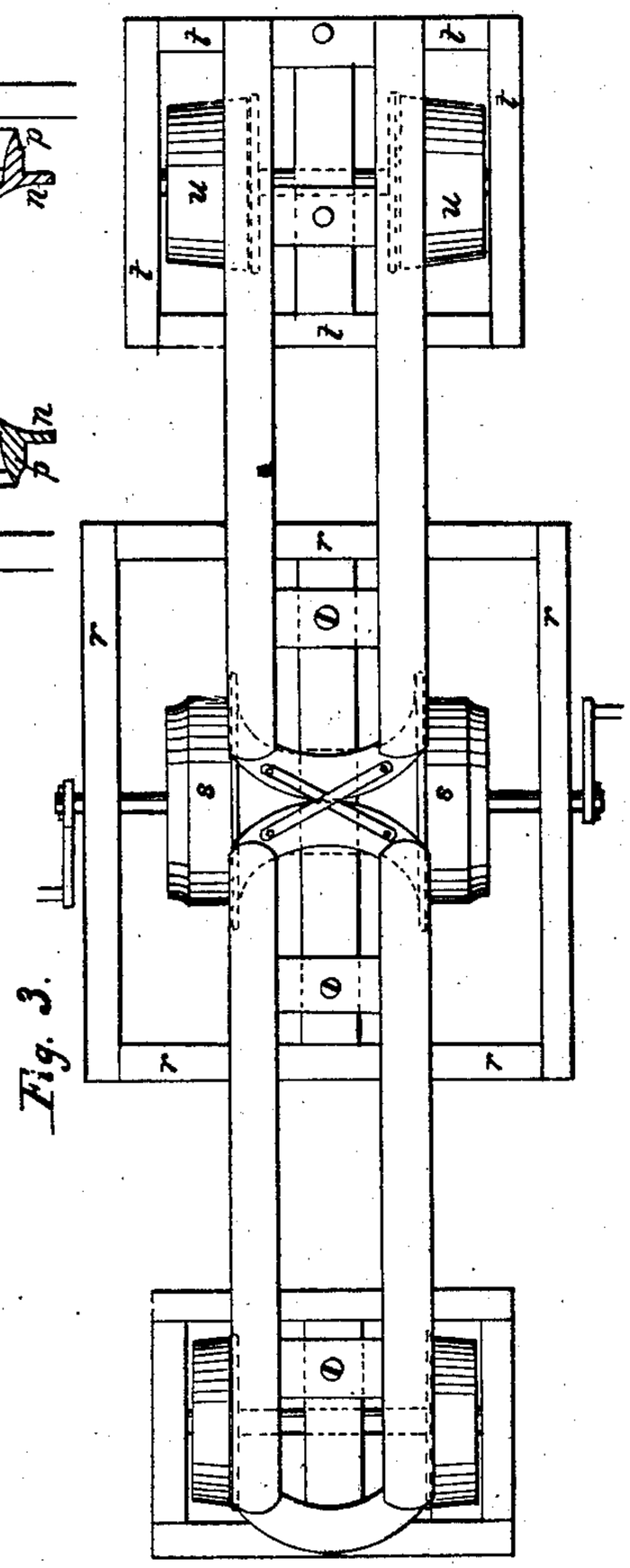


Fig. 3.



UNITED STATES PATENT OFFICE.

ROBERT GRANT, OF BALTIMORE, MARYLAND.

RAILROAD CARRIAGE AND WHEEL.

Specification of Letters Patent No. 999, dated November 3, 1838.

To all whom it may concern:

Be it known that I, ROBERT GRANT, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Consecutive Self-Regulating Trains of Railroad-Carriages and Wheels of the Same; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings which make part of this specification.

My improvement consists in the forming of a consecutive self-regulating train by connecting the trucks or frames of the wheels directly at their centers whether those frames contain more than one set of wheels or not and the wheels may be of the ordinary kind or of any other as may be found most beneficial.

As represented at *a*, Figure 1, which is a horizontal projection of the consecutive train they are constructed and operate in the ordinary manner. The frames in which these wheels revolve are made of a convenient and suitable size and of sufficient strength, consisting of three longitudinal pieces *b*, and two transverse pieces *c*, of any suitable length firmly secured to each other at their ends.

d, *d* represent the longitudinal pieces of the connecting frame *e*, *e*, the transverse pieces which also are firmly secured at their ends by bolting or any other convenient method. To the ends of each of the longitudinal pieces of the connecting frames are attached circular pieces *f* having a suitable and proper curve.

When a frame of one set of wheels is used the center of the transverse piece *e* of the connecting frame is connected by a center pin *g* to the center of the transverse piece *c* of the wheel frame, but if one of two sets is used the center of the transverse piece *c* of the connecting frame is attached in the same manner to such a point in the center longitudinal piece *b*, of the wheel frame as that the periphery of the circular pieces of two connecting frames coming from opposite direction shall meet and touch over or at the center of the frame and in either case the center pin *g* is the fulcrum or turning point on which the connecting frames radiate and constitutes the center of a segment of a circle described by the above mentioned circular pieces. The connecting frames may be either over or under the wheel frames as may be desired. If they are over the car bodies or burden is attached to them in any convenient manner, but if under the burden is attached to the wheel frames and in both instances the result of the connection is the same.

The circular pieces when so coming together are kept in their true position by open or double joints, *h*, or they may have cogs on their peripheries working into each other. When it is desired to use a frame of two sets of wheels, I combine two of my single frames and secure them in any convenient manner, as shown at *i* they are attached by a metallic plate, *j*, firmly riveted to the sides of the longitudinal pieces of the frames to be connected, and a pin represented by the dotted lines, *k*, passing from the end of one longitudinal piece into the other. In order to give elasticity to the touching parts of the peripheries of the circular pieces, I attach a plate of steel, *l*, which shall operate as a spring by cutting out a certain portion of the periphery and placing it in its stead, the curve of which said spring, is smaller that that of the circular piece; and the center piece, *g*, works in a slot in the longitudinal piece *b*, of the wheel frame, represented by the dotted lines, *m*, or it may work in any convenient manner.

Fig. 2, is a sectional view of my improved wheel, showing the conical form of the inner periphery. As by the employment of this wheel in my consecutive self regulating train of cars, greater perfection is obtained, and as I have already obtained Letters Patent dated the 22d day of July, 1837, to which I refer for the manner of constructing said wheel, this being only a modification thereof I wish to claim it in connection with said train.

n, represents the outward form of a set of the outer wheels and axle. *o*, *o*, are the inner wheels revolving on the inner periphery of the outer, the axle of which revolves in a tube, which tube constitutes the axle of the outer wheels. My improvement now consists in making said inner periphery *p*, of a conical form, making it wider than is necessary for the true revolution of the inner wheels, and shortening the length of their axles so much that the distance between them is equal to the distance between the inside of the periphery of one and the outside of the other, with the exception of the width of one. It will be readily seen that in turning curves this improvement is of impor-

tance, inasmuch as it diminishes lateral friction. That inner wheel which is on the outward circumference of the curve, at first rests upon the outer side of the periphery of the outer wheel and in turning, it naturally and gradually rises upon the inclined or conical periphery, while the other operates in a contrary direction. It may be further understood that this principle will operate in a train of carriages upon a common road as well as on a rail road.

Fig. 3 of the drawings shows the method of connecting my improved wheels to the frames. *r* represents a suitable frame upon which the locomotive or other motive power rests; *s*, my improved concentric conical wheels with the above mentioned connection of the connecting frames at the center; *t*, a suitable frame containing two or more conical wheels, *u*, which move in advance of the train governing the direction of it, and to which all the remaining frames are consecutive. When used on common roads, the forward frame may contain one or more wheels and may be guided in any convenient manner.

What I claim as my invention, in the consecutive self-regulating train of rail road carriages, and desire to secure by Letters Patent, is—

The connecting and combining the frames of traction which I have denominated the connecting frames with the trucks or frames of the wheels in such a manner as that the connecting point shall be directly at, over or under the center of the frames of the wheels, the fulcrum or turning point being at such a distance from said point of connection as shall be necessary for the radiation of the wheels. In the improved wheel, I claim the conical form of the inner periphery, in the manner and for the purposes above described and set forth.

ROBERT GRANT.

Witnesses:
JOHN W. HUBBARD,
Jos. B. WOOD.