S. A. GRANT.

TRACTION MACHINE.

APPLICATION FILED JAN. 13, 1913.

1,118,341.

Patented Nov. 24, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

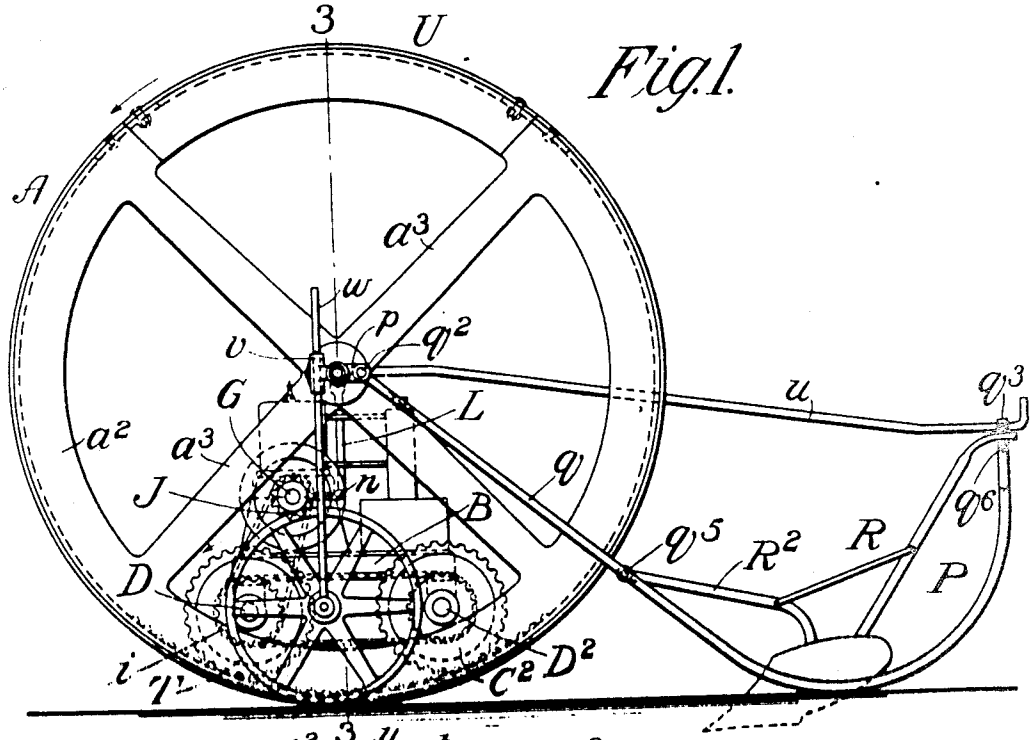
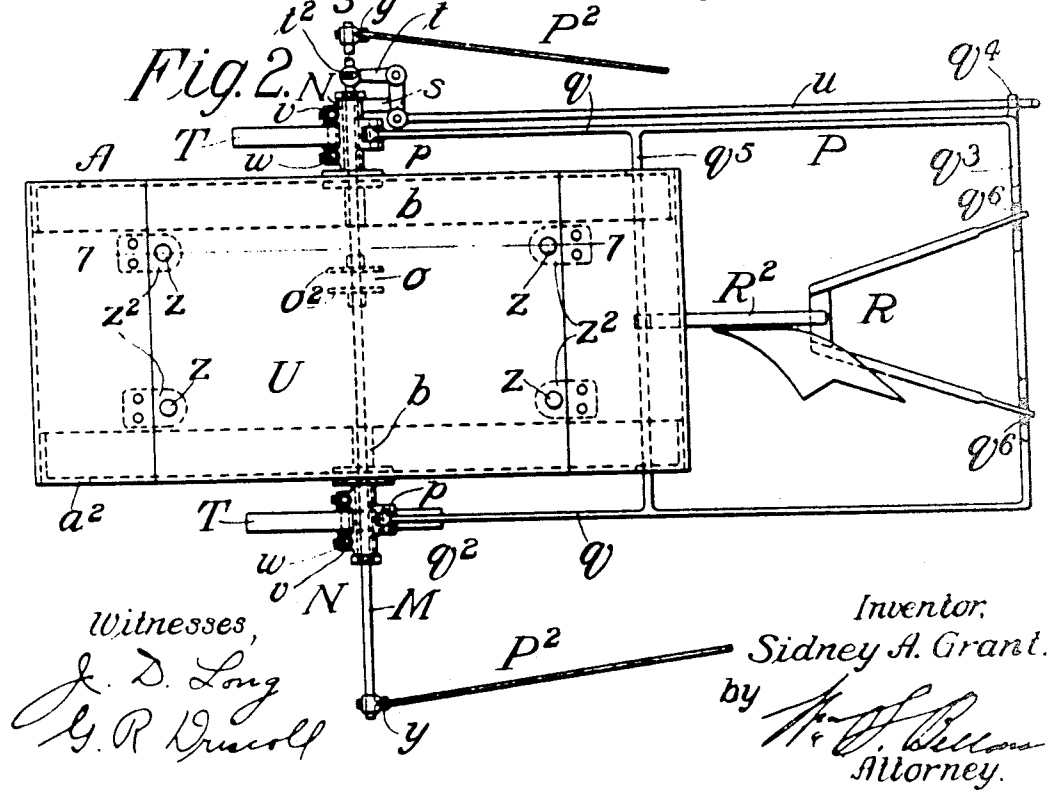


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

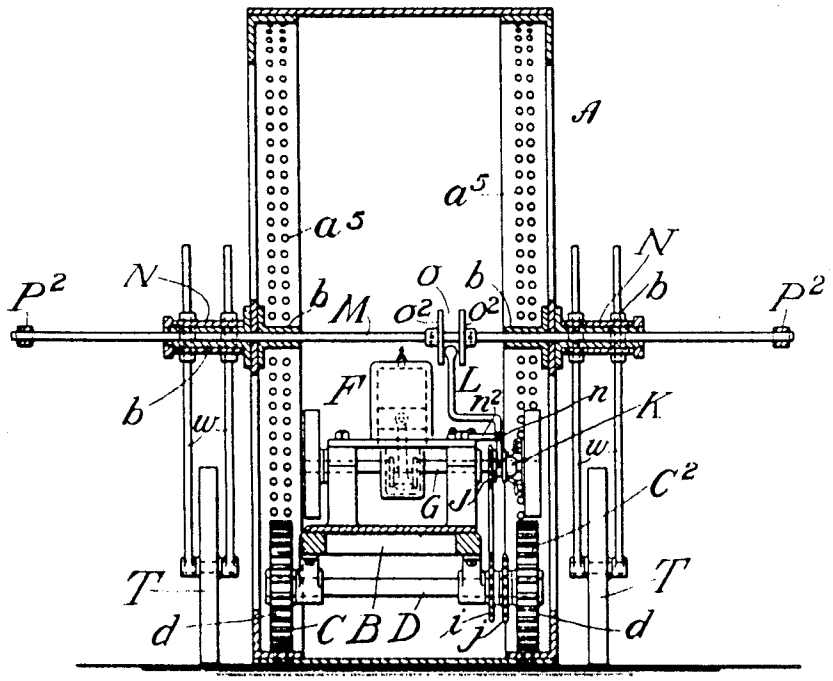


Fig. 4.

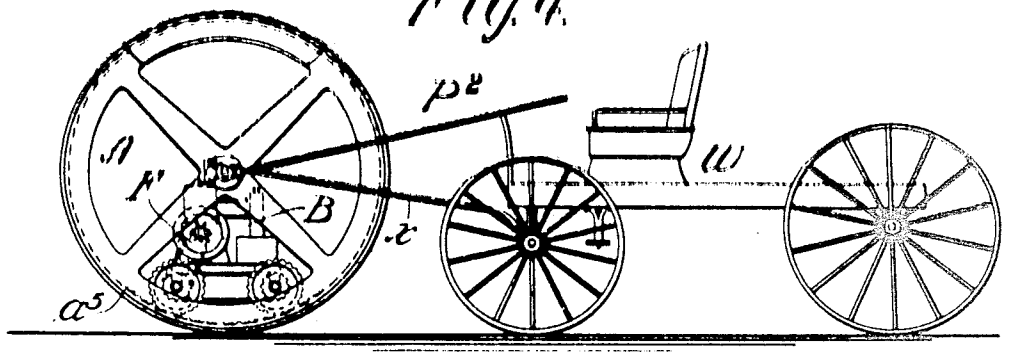
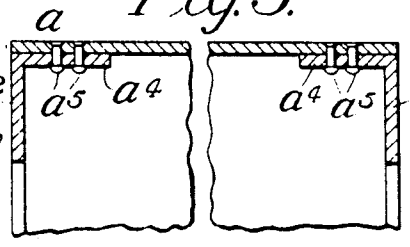


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

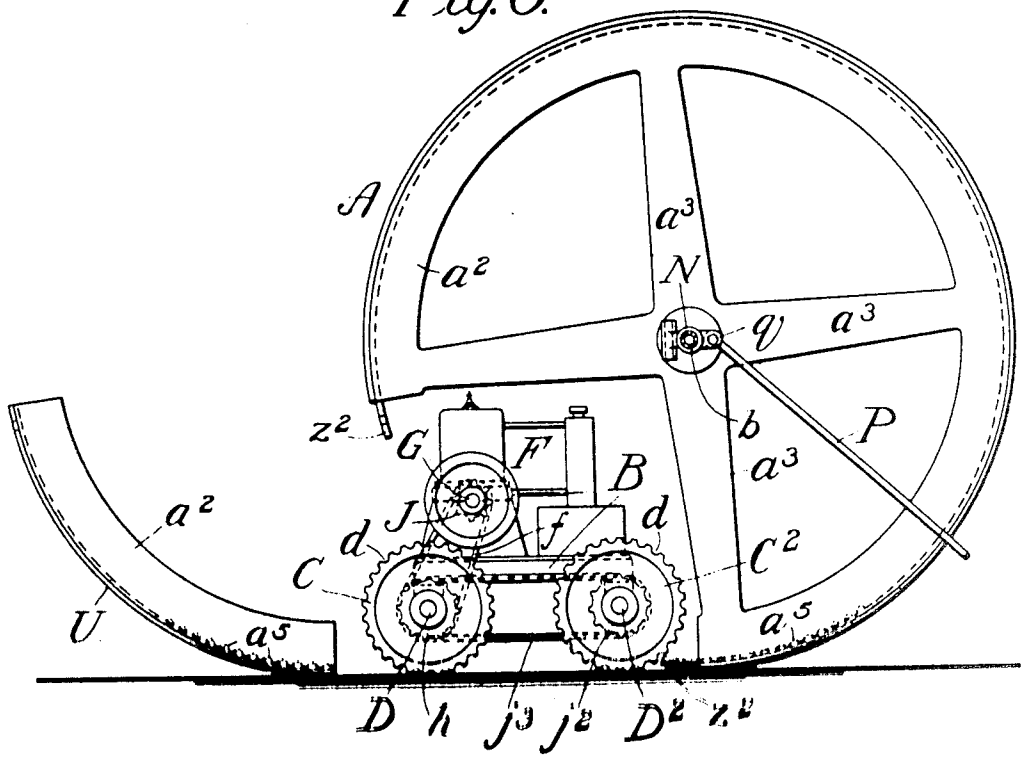


Fig. 7.

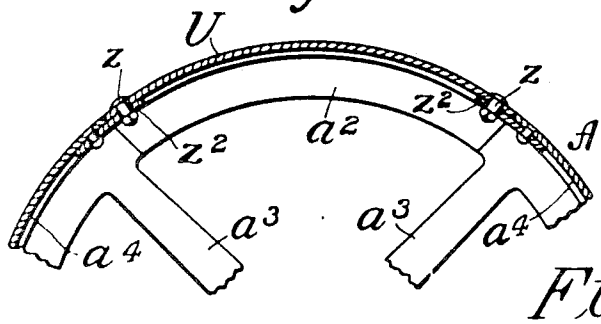


Fig. 8.

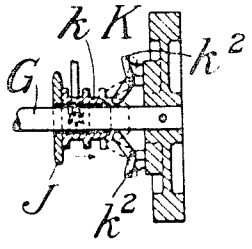
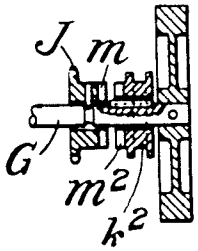


Fig. 9.



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UNITED STATES PATENT OFFICE.

SIDNEY A. GRANT, OF THOMPSONVILLE, CONNECTICUT.

TRACTION-MACHINE.

1,118,341. Specification of Letters Patent. Patented Nov. 24, 1914.

Application filed January 13, 1913. Serial No. 741,731.

To all whom it may concern:

Be it known that I, SIDNEY A. GRANT, a citizen of the United States of America, and resident of Thompsonville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Traction-Machines, of which the following is a full, clear, and exact description.

This invention relates to an improved tractor to serve as the drive or propulsion means for various implements, machines, appliances or vehicles, and to also be susceptible of serving directly or positively in the performance of certain kinds of work.

The invention is described in conjunction with the accompanying drawings and is set forth in the claims.

In the drawings:—Figure 1 is a side elevation of the tractor shown as serving for the draft of a plow. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a sectional elevation as seen on a plane of section centrally and vertically coincident with the axis of the tractor,—that is on line 3—3, Fig. 1. Fig. 4 is an elevation similar to Fig. 1, but showing the tractor employed for the draft of a carriage. Fig. 5 is a sectional view showing a detail of construction of the internal track wheel. Fig. 6 is a side elevation showing the removability of a circumferential portion of the track wheel whereby the engine supporting carriage may be either placed within or taken from the interior of the track wheel. Fig. 7 is a sectional view in detail on line 7—7, Fig. 2. Figs. 8 and 9 are sectional views showing clutch devices as examples of provisions which may be made use of in the present machine.

In the drawings, A represents the internal-track wheel adapted to roll in a forward direction along on the ground as impelled by the motor driven carriage therewithin. The track wheel comprises a circumferential portion a, radially inwardly extending flange portions a^2, a^2, tubular hub members b, and memebrs a^3 connecting said flanges and hub. The flange portions a^2 may practicably be integral parts of annular members of an L-shape or angular cross sectional contour, as represented in Figs. 5 and 7,—the rim portion being riveted to the members a^4.

The internally located heads of the rivets a^5, a^5, understood as extending circumferentially and entirely around the internal wall of the track-wheel rim being at uniform spacing, constitute inward projections with which coact recesses correspondingly spaced in the wheels of the motor driven carriage which is adapted for an advancing movement within the endless internal trackway which is constituted by the rim of the wheel A.

The carriage B has forward and rearward pairs of wheels C and C^2, united by axles D and D^2 on which the wheels are fast,—transverse regularly spaced recesses d in the rims of the said carriage wheels engaging with the aforementioned rivet heads a^5 or inward projections within the tractor wheel rim.

F represents an engine or motor which may be of explosive gasolene, or other, type, and is mounted on the carriage B,—G representing the engine shaft.

J represents a sprocket wheel loose on the engine shaft, around which runs a sprocket chain f which is also engaged around a sprocket wheel i on the forward axle of the carriage.

j represents a second sprocket wheel on the forward axle D,—j^2 representing a similar sprocket wheel on the rear axle D^2, and j^3 represents a sprocket chain by means of which the forward axle, driven, drives the rear axle.

K represents a clutch through the operation of which the sprocket wheel J, normally loose on the engine shaft, may be clutched or locked thereto and caused to rotate as one therewith. Appurtenant to this clutch is a slidable collar k which is the operating clutch member, this collar being in Fig. 8 represented as peripherally grooved and the sprocket wheel J is unitary therewith. The levers or dogs k^2 pivotally mounted on and revoluble with the engine shaft (as by being carried on the fly wheel) serve as interlocking means when the grooved collar is moved outwardly to cause an interlocking engagement with such collar, constraining the latter to turn with the shaft. A form of clutch such as represented in Fig. 9 might be employed. In this view, the sprocket wheel J, loose on the engine shaft, is constrained against endwise movement, and it has clutch teeth m on its hub. The sleeve k^2 splined on and slidable axially of the engine shaft is peripherally grooved and has clutch teeth m^2 in its end

toward the sprocket wheel hub, so that here also when the sleeve is slid in the proper direction, the clutch connects the sprocket wheel J with the engine shaft.

L represents a lever pivotally mounted at n on a bracket n^2 provided on the carriage so that such lever may swing in a vertical plane which is substantially coincident with the axis of the internal-track wheel; and the lower arm of this lever L which is of a fork or yoke shape, engages in the annular groove of the operating member k, (Fig. 8), or k^2 (Fig. 9) of the axially slidable clutch device. Through the tubular hubs of the internal track-wheel, a rod M is axially movable, the same having an appliance on an intermediate portion thereof within the track wheel providing an annular groove o within which the upper arm of the aforementioned intermediately pivoted lever L engages. As shown in Figs. 2 and 3, this annular groove or channel o is formed between the pair of collars o^2 fastened by set screws at suitable spacing on the rod.

N represents non-rotative sleeve-like members having supporting engagements on the outwardly projecting portions of the track wheel hubs b; and to rearwardly extending ear pieces p of these sleeve members, side bars or portions $q\ q$ comprised in a frame P are connected by transverse and axially horizontal pivots q^2 whereby the frame P may have a vertical swinging movement. This frame P is of bail or yoke form, and also comprises the transverse rear member q^3 which unites the side members Q. One of the aforementioned sleeve members N is provided with a horizontal rearwardly extending bracket s on which a bell crank or angular lever t is pivotally mounted; and the forwardly extending arm of this angular lever has as indicated at t^2 in Fig. 2, a stud and slot engagement with a portion of the aforementioned rod M which projects at one side outwardly beyond the hub of the track wheel A. To the rearwardly located and transversely disposed member of the angular lever t a thrust rod u is pivotally connected, the same ranging alongside one of the side members q of the frame P, and has a supporting and guiding engagement through an apertured lug q^4 provided at a rear portion of the frame.

Assuming that the carriage supported engine is started running,—by the means which it is understood to be provided with, for its starting and stopping,—and the thrust rod u is moved in the proper direction, the latter will, through the angular lever t, cause an axial movement of the rod M, and a swinging movement of the lever L, thereby placing the sprocket wheel J in clutch connection with the engine shaft and consequently causing from the rotations of such shaft the propulsion forwardly of the engine supporting carriage. Such carriage having a degree of movement forwardly and upwardly on the endless internal-track of the wheel A, will produce a rolling movement of such wheel along the ground for whatever useful purpose the same may be made to serve.

As represented in Figs. 1 and 2, the side members of the frame P are additionally joined by the transverse intermediate member q^5 to which the tongue or draft bar R^2 of a plow R is connected.

The handles of the plow may be extended through depending eye members at q^6 so that when the apparatus is utilized as a plowing machine, the person grasping the handles of the plow and controlling the action of the latter may, at the same time, effect the guidance of the internal track wheel in its proper course: This being practicable as any transverse force imparted to the plow handle, will, by reason of the engagement of the latter with the frame P, correspondingly affect such frame; and such frame being jointed to the sleeve member provided at the hub of the track wheel is directly effective for the guidance of the latter.

While the internal-track wheel is of such substantial width that it will not ordinarily be liable to fall over sidewise, there are occasions when means for the prevention of sidewise tipping are necessary, such, for instance as when employing the tractor on a side hill; and with reference to Figs. 1, 2 and 3, it will be perceived that the aforementioned sleeve members are constructed with socketed lugs $v\ v$ offset from the axial line of the sleeves in which depending members w are engaged and confined, which members are provided at their lower portions with rollers T, which are revoluble in planes parallel with the plane of revolution of the track-wheel and have rolling bearing on the ground. When it is not necessary or desirable to use these steadying wheels T T, the supporting members or hangers $w\ w$ may be moved upwardly through the socket lug, or they may be removed from their fixed engagements therein.

As an example of one other of the many utilizations which may be made of this tractor, I have represented it in Fig. 4 as a motive power for the drawing of a carriage W. Here the shafts x of the carriage are connected with the aforementioned sleeve members N N which are non-rotatively mounted on the hubs of the tractor wheel; and here for the guidance of the track wheel, a yoke frame P^2 has the side members thereof connected to the opposite extremities of the aforementioned rod M which is mounted for endwise play axially through the track wheel. The side members of this bail-shaped frame or yoke P^2 is pivotally connected to the ear lugs y, which may be de-

tachably fastened on the extremities of the rod M. Of course, when there is no occasion for the presence of the bail or yoke frame P^2, it may be readily disconnected from the tractor.

It is to be perceived that the carriage supported engine is not positively connected with any internal part or equipment of the internal-track-wheel; and that provision is made for its entrance into and removal from the track wheel as may be necessary or desirable.

The rim portion of the track wheel has a removable partial circumferential wall-forming portion or section U adapted to close a vacant place or opening in the rim proper of the wheel and to be confined by the bolts z which are passed through the said section U and through the extension lugs z^2 formed as part of or rigidly secured to the rim proper of the track wheel.

Various changes of minor character may be made in the construction of the tractor without departing from the present invention or sacrificing any of the advantages thereof.

I claim—

1. A rolling internal-track wheel, a wheeled carriage adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft, having a wheel loosely mounted thereon, a clutch device including a collar slidable on the engine-shaft for connecting said wheel to said shaft, means driven by said wheel for the propulsion of the carriage, a rod axially mounted and movable in the internal-track wheel having a device comprising an annular groove, a lever pivotally mounted on the engine carriage, one arm of which engages in the annular groove appurtenant to said slidable rod, while its other arm engages the slidable collar on the engine shaft, an angular lever pivotally mounted on a fixed support adjacent the hub portion of the track-wheel, having one of its arms connected to said rod, and a manually operable rod connected to the other arm of said angular lever

2. A rolling internal-track wheel, a carriage having wheels, and an axle, uniting a pair of such wheels, and provided with a sprocket wheel thereon, said carriage being adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft with a sprocket wheel loosely mounted thereon, a clutch device including a collar slidable on the engine-shaft for connecting said wheel to said shaft, a sprocket chain in running engagement around the engine shaft sprocket and the carriage axle sprocket, a rod axially mounted and movable in the internal-track wheel having an annular grooved member, and a lever pivotally mounted on the engine carriage, one arm of which engages in the annular groove appurtenant to said slidable rod, while its other arm engages the slidable collar on the engine shaft.

3. A rolling internal-track wheel, a carriage having pairs of wheels, and forward and rear axles uniting such pairs of wheels, one of said axles having a sprocket wheel thereon, and said carriage being adapted for an advancing movement of the internal track of the wheel, an engine mounted on the carriage having a shaft, with a sprocket wheel loosely mounted thereon, a clutch device including a collar slidable on the engine-shaft for connecting said wheel to said shaft, a sprocket chain in running engagement around the engine shaft sprocket and the carriage axle sprocket, chain and sprocket wheel connections whereby one axle is driven from the other, a rod axially mounted and movable in the internal-track wheel having a device comprising an annular groove, and a lever pivotally mounted on the engine carriage, one arm of which engages in the annular groove appurtenant to said slidable rod, while its other arm engages the slidable collar on the engine shaft.

4. A rolling internal-track wheel having outwardly projecting hubs, a wheeled carriage adapted for advancing movement on the internal track of the wheel, an engine on the carriage having a shaft, propulsion means for the carriage adapted for connection with, and disconnection from, the engine shaft, means operable externally of the track wheel, for connecting and disconnecting said propulsion means and engine shaft, non-rotative sleeve-like members having supporting engagements on said hubs, and a frame comprising opposite side members connected to said sleeve members.

5. A rolling internal-track wheel having outwardly projecting hubs, a wheeled carriage adapted for advancing movement on the internal-track of the wheel, an engine on the carriage having a shaft, propulsion means for the carriage adapted for connection with, and disconnection from, the engine shaft, means operable internally of the track wheel for connecting and disconnecting said propulsion means and engine shaft, non-rotative sleeve-like members having supporting engagements on said hubs, and a frame comprising opposite side members pivotally connected to said sleeve members and adapted for a vertical swinging movement.

6. A rolling internal-track wheel having outwardly projecting hubs, a wheeled carriage adapted for advancing movement on the internal track of the wheel, an engine on the carriage having a shaft, propulsion means for the carriage adapted for connection with, and disconnection from, the en-

gine shaft, means operable externally of the track wheel, for connecting and disconnecting said propulsion means and engine shaft, non-rotative sleeve-like members having supporting engagements on said hubs, and having vertical sockets offset from their axes, depending members having fixed engagements in said sockets, and provided at their lower portions with rollers revoluble in planes parallel with the plane of revolution of the track wheel, and a frame comprising opposite side members connected to said sleeve members.

7. A rolling internal-track wheel, having tubular hub members, a carriage having pairs of wheels, and forward and rear axles uniting such pairs of wheels, one of said axles having a sprocket wheel thereon, and said carriage being adapted for an advancing movement of the internal track of the wheel, an engine mounted on the carriage having a shaft, with a sprocket wheel loosely mounted thereon, a clutch device including a collar slidable on the engine-shaft for connecting said wheel to said shaft, a sprocket chain in running engagement around the engine shaft sprocket and the carriage axle sprocket, chain and sprocket wheel connections whereby one axle is driven from the other, a rod axially mounted in and movable through the tubular hubs of the internal-track wheel having a device comprising an annular groove, a lever pivotally mounted on the engine carriage, one arm of which engages in the annular groove appurtenant to said slidable rod, while its other arm engages the slidable collar on the engine shaft, sleeve members on the said tubular hubs, a frame comprising opposite side members connected to said sleeve members, an angular lever mounted on one of said sleeve members, having one arm thereof in connection with said rod, a thrust-rod connected to the other arm of such angular lever and extended to a rear part of said frame, and a member on the frame for supporting and guiding the thrust rod.

8. A rolling internal-track wheel, having a removable circumferential wall forming portion, and means for its confinement as a fixed portion of the wheel, a wheeled carriage adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft, propulsion means for the carriage adapted for connection with, and disconnection from the engine shaft, and means for connecting and disconnecting said propulsion means and engine shaft.

9. A rolling internal-track wheel comprising a circumferential portion, radially inwardly extending flange portions at opposite sides, hubs and members connecting said flanges and hubs, a wheeled carriage adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft, propulsion means for the carriage adapted for connection with, and disconnection from the engine shaft, and means for connecting and disconnecting said propulsion means and engine shaft.

10. A rolling internal-track wheel, having internally and circumferentially a plurality of spaced inwardly extending projections, a carriage having wheels, the rims of which have spaced recesses corresponding to said projections, and adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft, propulsion means for the carriage, adapted for connection with, and disconnection from the engine shaft, means operable from the exterior of the internal-track wheel for connecting and disconnecting said propulsion means and engine shaft, and means for guiding the course of rolling movement of the track wheel.

11. A rolling internal-track wheel, a wheeled carriage adapted for an advancing movement on the internal track of the wheel, an engine mounted on the carriage having a shaft, propulsion means for the carriage, adapted for connection with, and disconnection from the engine shaft, means operable from the exterior of the internal-track wheel for connecting and disconnecting said propulsion means and engine shaft, comprising a rearwardly longitudinally extending thrust rod, and a yoke or bail-shaped frame having the forward extremities of the side members thereof connected with hub portions of the internal-track wheel and having means at the rear portion thereof with which said thrust rod has a guiding engagement.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

SIDNEY A. GRANT.

Witnesses:
G. R. DRISCOLL,
JAMES D. LONG.