(No Model.)

H. C. REAGAN.

TRACTION WHEEL.

No. 339,012. Patented Mar. 30, 1886.

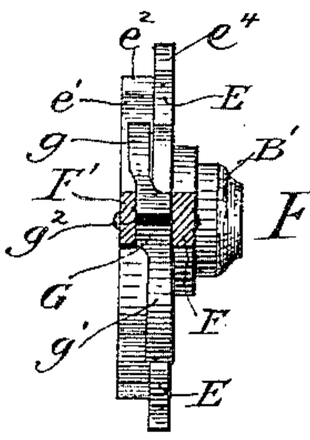


Fig. 6

Fig. 1

Fig. 2

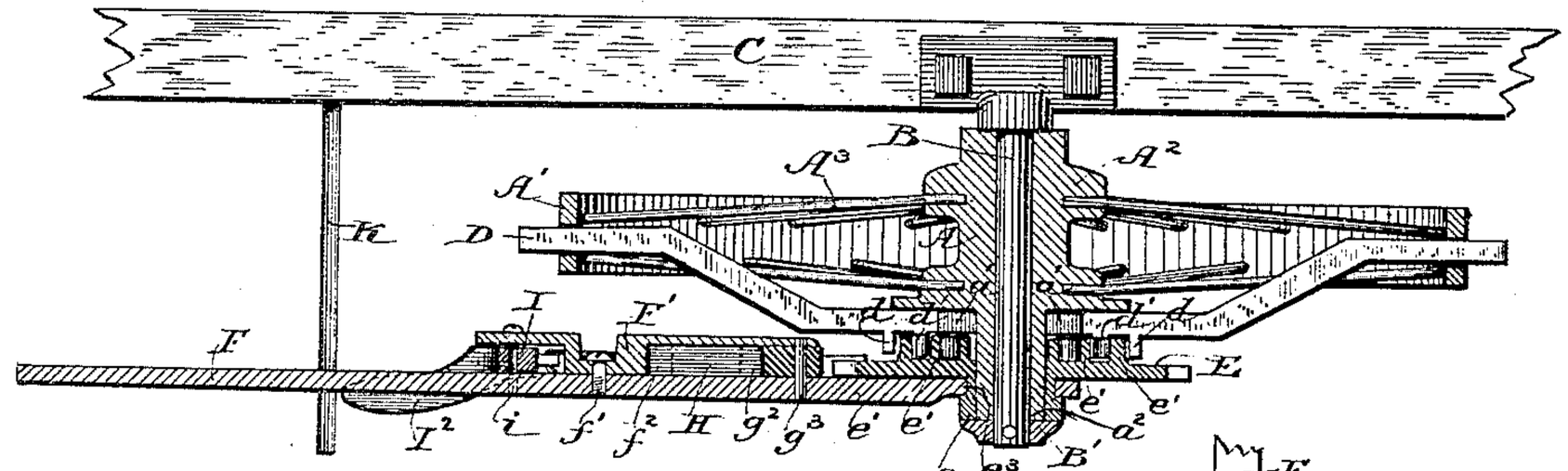


Fig. 3

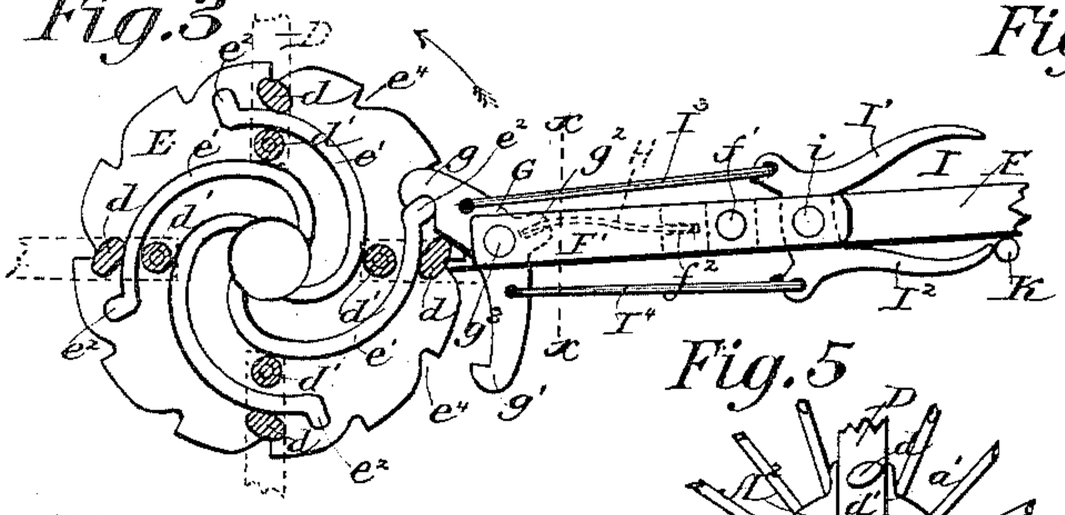


Fig. 5

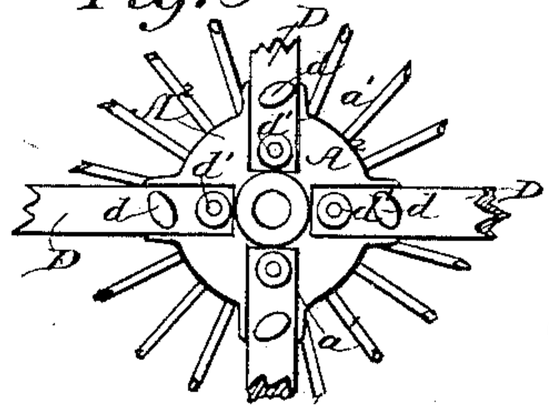
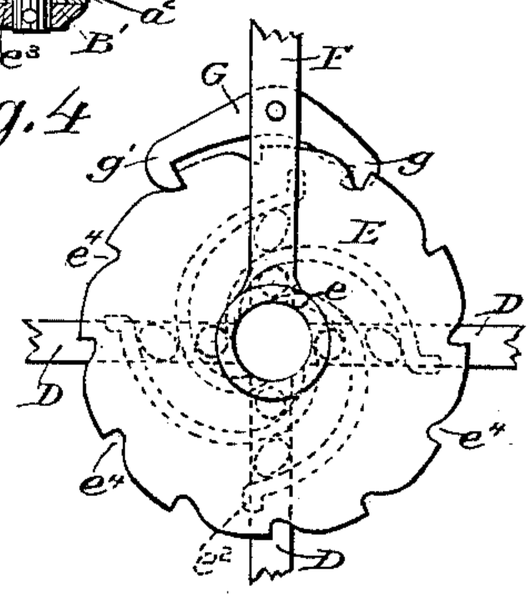


Fig. 4



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UNITED STATES PATENT OFFICE.

HENRY C. REAGAN, OF SALISBURY, MISSOURI.

TRACTION-WHEEL.

SPECIFICATION forming part of Letters Patent No. 339,012, dated March 30, 1886.

Application filed February 4, 1886. Serial No. 190,816. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. REAGAN, a citizen of the United States, residing at Salisbury, in the county of Chariton and State of Missouri, have invented certain new and useful Improvements in Traction-Wheels, of which the following is a specification.

Difficulty is experienced in the employment of traction-engines upon ordinary roads, from the fact that the road bed or surface becomes at times so soft and muddy that spurless wheels will slip without effecting a forward movement of the engine, and at other times the road is hard and rough, and is best adapted to wheels without spurs or projections upon their rims, for the reason that the spurs block the rotation of the wheels, and are liable to be broken off when brought forcibly in contact with hard, rough, and uneven surfaces.

My invention relates to means under control of the attendant for operating the spurs or spur-arms of traction-wheels to force them out from the rim of the wheel when the traction-engine is moving on soft or muddy road, and for retracting them within said wheel-rim when the engine travels upon hard and solid road-bed, as will hereinafter appear.

In the accompanying drawings, Figure 1 is a side elevation of my improved traction-wheel and part of the frame, showing the spurs retracted by full lines, and by dotted lines the spurs and their operating devices in the positions occupied when said spurs are projected from the rim of the wheel; Fig. 2, a plan of the same, showing the hand-lever, wheel hub and rim, and the cam-track disk in section, and showing the spurs projecting from the rim of the wheel; Fig. 3, an elevation of the inner face of the cam-track disk and hand-lever, with fragments of the spur-arms shown by dotted lines, and the friction-rollers and lugs upon said spur-arms shown in section; Fig. 4, a detail, an elevation of the outer face of the cam-track disk, fragments of the spur-arms, and the cam grooves or flanges for operating them shown by dotted lines, and with the lever and pawl for withdrawing the spur-arms shown in their elevated position; Fig. 5, a detail, an elevation of the face of the wheel-hub, with the spurs broken away, and with fragmental parts of the inner ends of the spur-arms shown in their retracted positions and in the recesses in the face of the wheel-hub; Fig. 6, a sectional elevation in the line x x of Fig. 3, showing in detail the cam-track disk and pawl for controlling and operating it.

The wheel A is journaled upon an axle, B, securely bolted to a side beam, C, of the frame of a road-engine, the ends of said beam being broken away, as the form of frame employed is not material to my invention. The wheel is in this instance formed of a cast-metal rim, A′, and hub A^2, united by spokes A^3, arranged in two circles, dished in opposite directions to brace each other in a well-known manner, to provide a light, strong, and durable wheel; but other forms of wheels may be employed, if preferred. The rim A′ of the wheel is perforated and bossed or thickened at four points, a, equally distant from each other around the periphery of the wheel, to receive and support the outer ends of the spur-arms D, and permit said arms to slide endwise to be projected from or drawn within the rim of the wheel, as may be desired. The spur-arms D are bent or curved to the outer side of the wheel, to allow their inner ends to be supported in sockets a', formed in the outer face of the wheel-hub, and slide freely endwise in said sockets. The hub A^2 has a smaller end, a^2, extended outwardly from its outer face, to support the hub e of a cam-track disk, E, and provide a bearing upon which said disk may be rotated. A cap-ring, B′, is secured upon the end of the axle B, and serves to hold the disk E and traction-wheel upon the axle. The cam-track disk E may be rotated in either direction upon the hub A^2 of the traction-wheel, either when said wheel is at rest or when it is in rotation; or the disk may be held stationary while the traction-wheel is revolved in either direction by means of a hand-lever, F, and pawl G, as will hereinafter appear. The cam-track disk E is formed with involute or eccentrically-arranged cam tracks or ribs e' projecting from its inner face, to provide double-walled grooves or channels between said ribs e', and the disk E is located with reference to the outer face of the wheel-hub in such manner that the lugs d and anti-friction rollers d', which are secured to and project from the inner ends of the spur-arms D, extend into the channels or grooves between the ribs e'. The lug and friction-

roller on each spur-arm are located upon opposite sides of a rib, e', and are adapted to follow said tracks or ribs when the disk is held stationary, while the wheel revolves, or when the disk is rotated in one direction independently of the wheel to force the spur-arms outwardly to project beyond the rim of the wheel, or when rotated in an opposite direction to draw them within said rim. The outward movement of the spur-arms is limited by stops e^2, formed upon the outer extremities of the ribs e', with which stops the lugs d upon the spur-arms come in contact, and the inward movement of said spur-arms is limited by the abutment of the inner ends of said arms against the bottom of the sockets a' of the wheel-hub. The stops e^2 upon the extremities of the track-ribs also prevent the lug d and roller d' from leaving the rib-track upon which they move, in which event the lugs would pass on from one rib to the other independently of and uncontrolled by the cam-track plate. The friction-roller d' will roll upon the outer face of the track-ribs when the spur-arms are forced outwardly, and will roll upon the inner face of the adjacent rib when the spur-arms are drawn within the periphery of the drive-wheel. When not otherwise acted upon, the cam-track disk E will revolve with the wheel A and hold the spur-arms D in whatever position they may be placed by the hand-lever F and pawl G. The hand-lever F is journaled in a groove, e^3, formed upon the hub e of the cam-track disk, and is thus freely fulcrumed thereon. The pawl G is pivotally secured at g^3 to the lever F, and is formed with double jaws g g', hooked in opposite directions, to operate, respectively, the one upon the inner face of the track-disk and the other against the periphery thereof, as shown at Fig. 6, and engage, respectively, with the stop e^2 of the track-disk E and notches e^4, formed upon the periphery of said disk. When the pawl G is not in use, it is held out of contact with the notches and stops of the hub-disk by means of a plate-spring, H, held upon the hand-lever F by means of a butt-plate, F', secured at f' to the side of said hand-lever. The pawl G is pivoted to and between the plate F' and lever F, and is slotted at g^2, to receive the forward end of the plate-spring H, and the rear end of said plate-spring is seated in a similar slot, f^2, in the plate F'. The spring H will thus permit the pawl to be moved in either direction and hold it normally inoperative. The pawl G is moved in either direction to engage one or the other of the jaws g g' with the cam-track plate by means of a double-armed thumb-lever, I, pivoted at i between the plate F' and lever F, with one of its arms, I', above and the other arm, I^2, below the lever F. The plate F' is thus held against the side of the lever F by the screw f' and pivot-pins i and g^3, and serves to hold the pawl G, spring H, and thumb-lever I securely thereon in a simple and effective manner. Rods I^3 I^4 connect, respectively, the upper and lower arms of the thumb-lever with the corresponding jaws of the pawl G, and permit the pawl to be freely operated by the thumb-lever I at the same time that the lever F is raised and lowered. The operator, with the lever F in his hand, can move the thumb-lever I in an evident manner to engage the pawl-arm g with the stops e^2, as shown at Figs. 1 and 3, or to engage the pawl-arm g' with the notches e^4, as shown at Fig. 4. When the pawl G is engaged with a stop, e^2, and the wheel A is moving forward in the direction shown by the arrow at Figs. 1 and 3, the disk E will be arrested and held, while the wheel revolves and carries with it the spur-arms D, which latter will be forced outwardly by the track-ribs e', acting on the rollers d', until one of the trip-lugs d strikes the arm g, as shown at Fig. 3, and trips or lifts the arm or pawl g, and releases the disk. All of said lugs d then push against the stops e^2, and rotate the wheel and disk together, and thus hold the end of the spur-arms D out to their full extent beyond the rim of the wheel. When the pawl g' is engaged with the notches e^4 upon the periphery of the cam-track disk E, the said disk may be rotated by the upward movement of the hand-lever F from the horizontal position of the lever shown in Fig. 3 to or toward its vertical position shown in Fig. 4, by which means the rollers d' will be forced backward by the ribs e', and thereby retract the outer extremities of the spur-arms within the rim of the wheel. When the engine is moved backward, the pawl-jaw g' is engaged with the notches e^4 to retract the spur-arms, and the pawl-jaw g is moved forward or upward by the hand-lever to engage with one of the stops e^2, and is then drawn back to revolve the hub-disk E and force the spurs outwardly. When the lever F is not in use, it may rest upon a bar, K, or upon any fixed portion of the frame.

My invention may be applied to traction-wheels of various constructions, and can be quickly and easily operated without stopping the engine, although I prefer stopping it to rotate the disk E in retracting the spur-arms. When the engine is driven over soft or muddy places in the road and the wheels slip or do not properly take hold, the spur-arms can be projected beyond the periphery of the wheel by using the lever F, as hereinbefore described, and when the engine is moving on good road and the spurs are no longer needed, they can be retracted, as hereinbefore described. Thus the operator can, whenever desired, readily, easily, and quickly thrust the spurs outward from the rim of the wheel and retract them as readily to pass over extended or very short portions of muddy road alternating with dry or hard portions.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in a traction-wheel, with the peripheral rim, spokes, and hub, of radial endwise-moving spur-arms supported

at their outer ends in the peripheral rim and at their inner ends in radial sockets upon the wheel-hub, and a cam-track disk having involute cam-tracks which coact with lateral lugs projecting from the spur-arms, substantially as and for the purpose specified.

2. In a traction-wheel, the combination, with the wheel hub, spokes, and rim, of spur-arms supported upon said hub and rim to move endwise therein, provided with lugs *d*, projecting laterally from their inner ends, a disk formed with track-ribs arranged eccentrically upon its face, and stops e^2, formed upon the outer extremities of the track-ribs, substantially as and for the purpose described.

3. The combination, in a traction-wheel, of the wheel hub, spokes, and rim, with spur-arms supported thereon, trip-lugs *d*, cam-track disk E, track-ribs *e'*, stops e^2, and a pawl, G, adapted to engage with and be disengaged from the stops e^2, substantially as and for the purpose described.

4. The combination, in a traction-engine, of the frame and axle with a traction-wheel, endwise-moving spur-arms, the cam-track disk engaged with the spur-arms by means of lugs which project laterally from each spur-arm, and a hand-lever fulcrumed upon the axle and provided with a pawl to engage with the cam-track disk, substantially as and for the purpose described.

5. In a traction-engine, the combination, with the hub, rim, and spokes, of endwise-moving spur-arms, a disk formed with track and stop ribs projecting from its face, and with notches e^4 upon its periphery and a double-hooked pawl, G, supported upon a lever and adapted to engage either with the notches or stop-ribs, substantially as and for the purpose described.

6. The combination, with the axle, of a cam-track disk adapted to engage with and actuate spur-arms, provided with projections upon its face and notches upon its periphery, a hand-lever fulcrumed upon the axis of the disk, a double pawl, G, adapted to engage either with the said projections or notches upon the disk, and a spring, H, secured to the hand-lever and pawl, substantially as and for the purpose described.

7. The combination, with the ratchet-notched cam-track disk E, of the hand-lever F and pawl G, provided, respectively, with slots f^2 and g^2, and plate-spring H, engaged and supported at its ends within said slots, substantially as and for the purpose described.

8. In a traction-wheel, the combination, with the cam-track disk E, of the hand-lever F, double pawl G, spring H, double thumb-lever I, and rods I^3 I^4, substantially as and for the purpose described.

9. The combination, with the disk E, of the hand-lever F, double pawl G, double thumb-lever I, spring H, and a butt-plate, F', secured upon said hand-lever, to hold the thumb-lever, spring, and pawl thereon, substantially as described.

10. In a traction-wheel, in combination, a wheel, a disk having eccentric cams, with stops e^2 and notched periphery, a hand-lever provided with a double-armed pawl, G, and a thumb-lever, I, connected therewith, for actuating said pawl, and spur-arms provided with lugs *d* and *d'*, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. REAGAN.

Witnesses:
WILL CLARK,
S. R. STOCKWELL.