

(No Model.)

4 Sheets—Sheet 1.

G. T. GLOVER.

TRACTOR FOR MAKING ICE ROADS AND HAULING LOGS.

No. 463,679.

Patented Nov. 24, 1891.

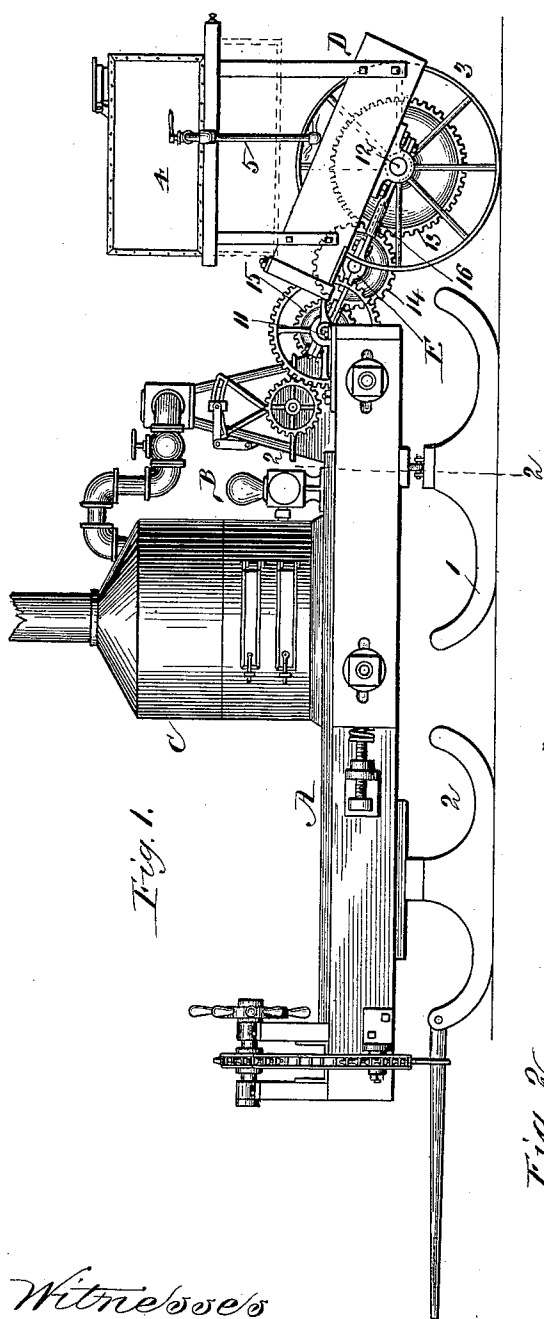


Fig. 1.

Fig. 2.

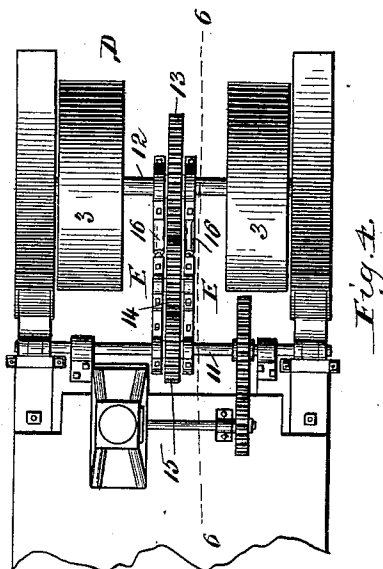
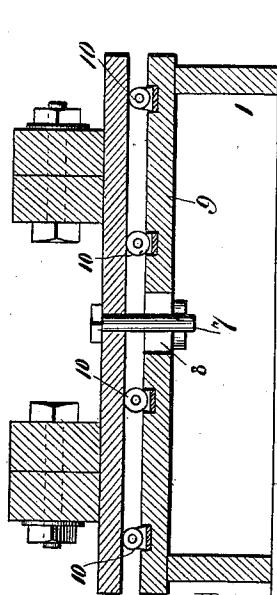


Fig. 3.

Fig. 4.

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Fig. 6.

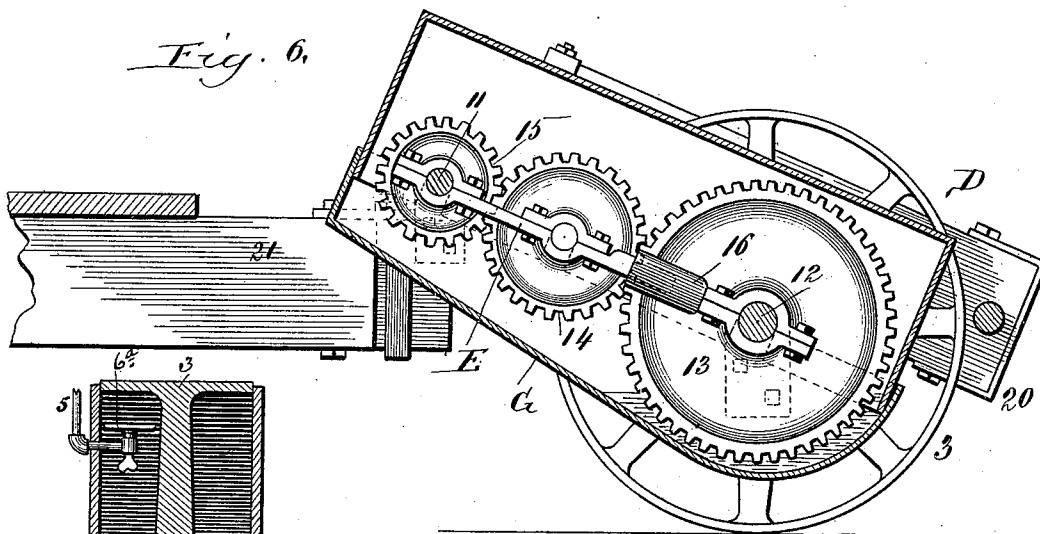


Fig. 5.

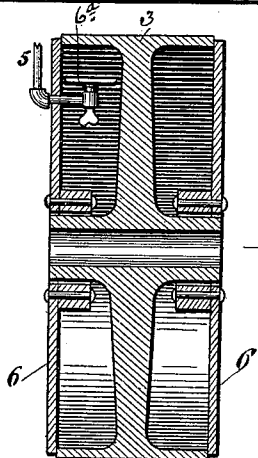
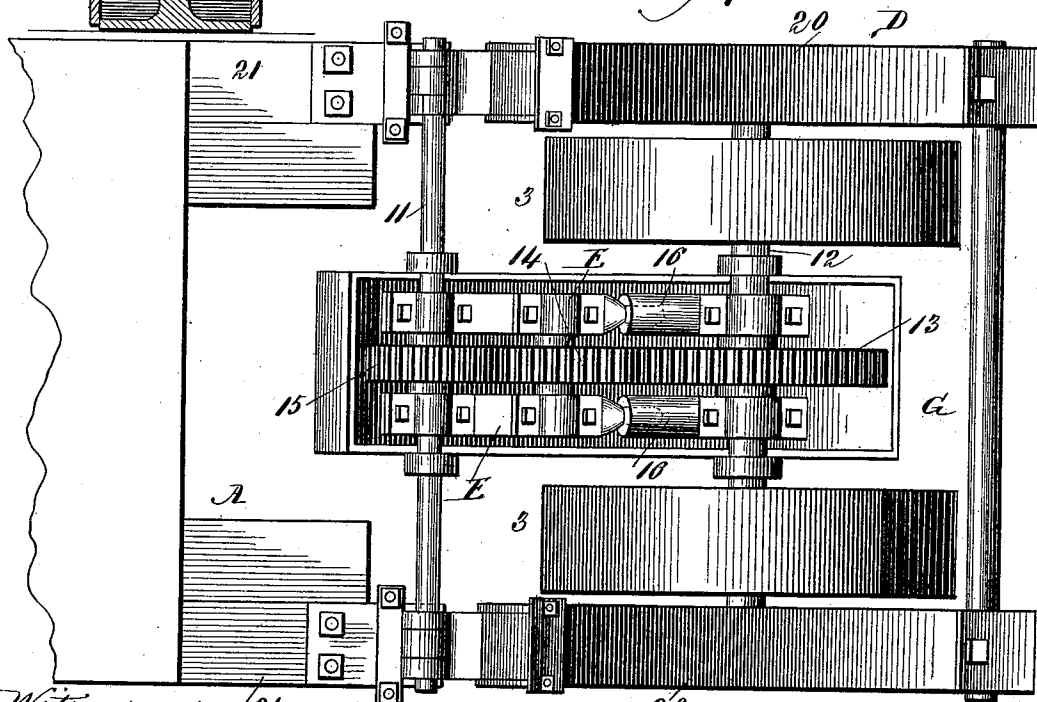


Fig. 7.



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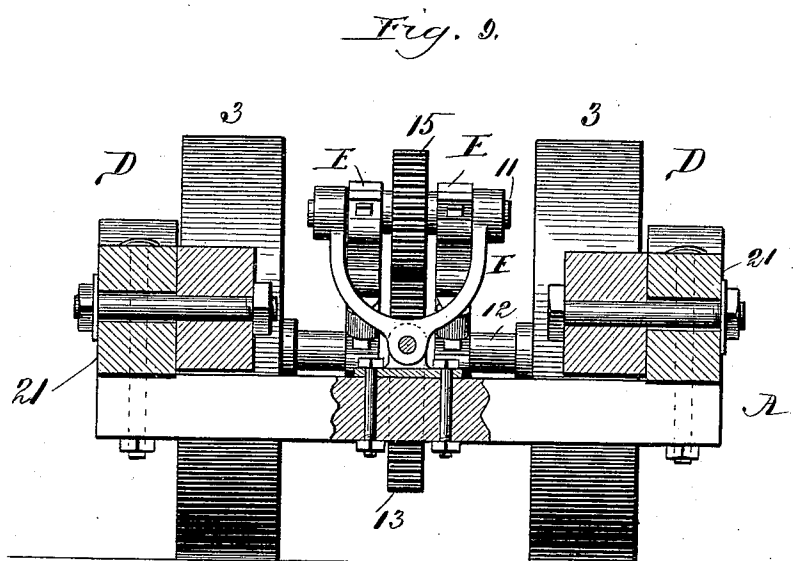
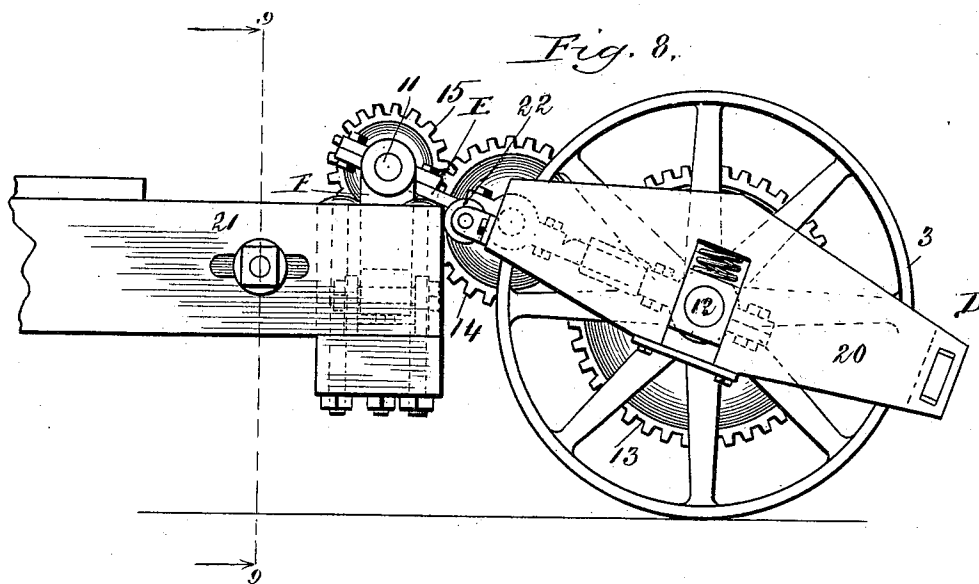
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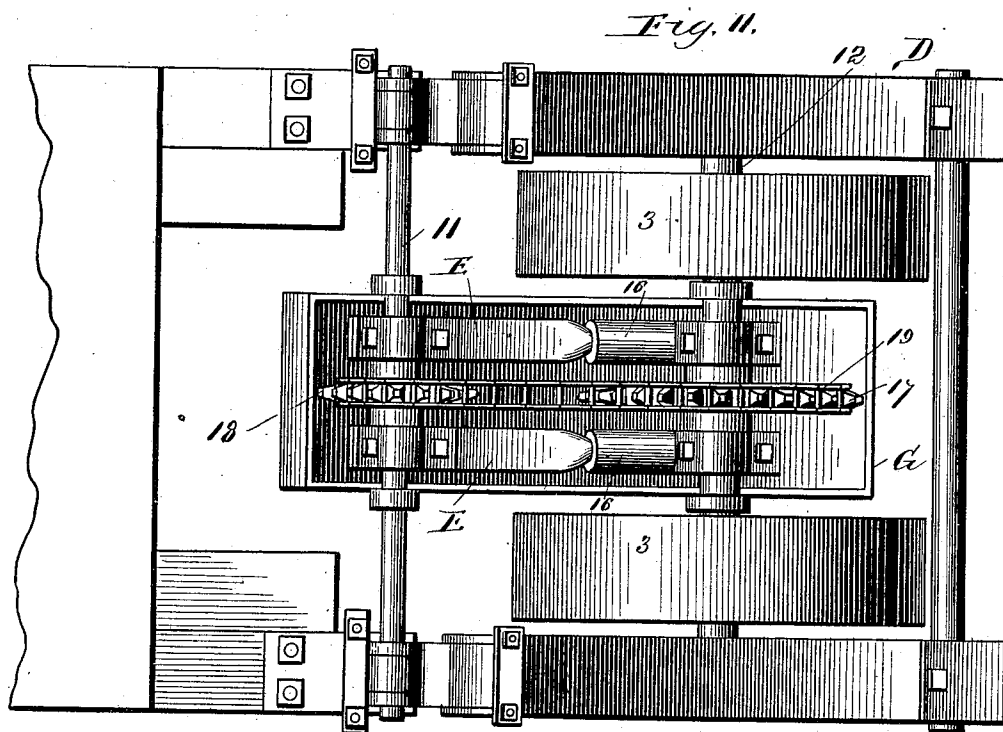
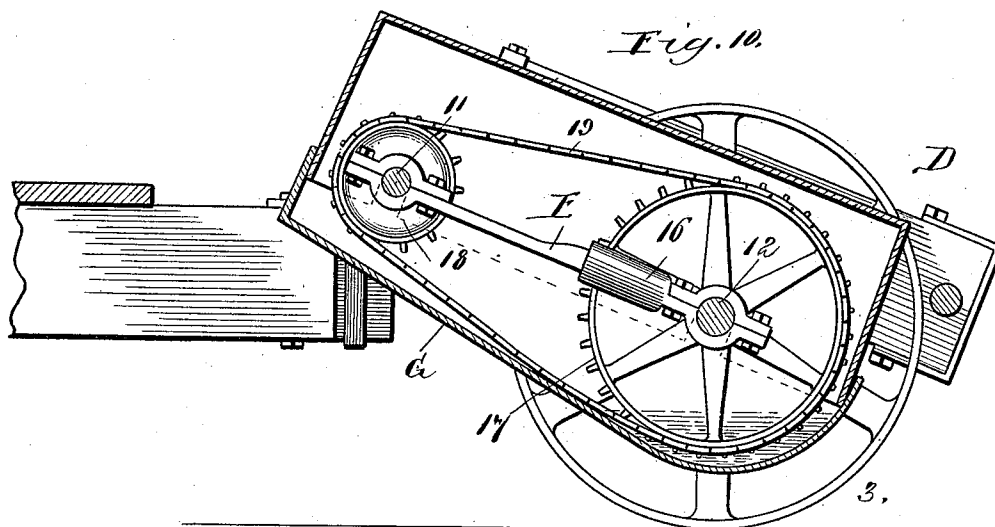
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UNITED STATES PATENT OFFICE.

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TRACTOR FOR MAKING ICE ROADS AND HAULING LOGS.

SPECIFICATION forming part of Letters Patent No. 463,679, dated November 24, 1891.

Application filed November 26, 1889. Serial No. 331,702. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. GLOVER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Tractors for Making Ice Roads and Hauling Logs, of which the following is a specification.

My invention relates more particularly to tractors for converting snow-roads into ice roads and hauling logs over the same.

In Letters Patent of the United States No. 426,006, heretofore granted to me, I have provided means for steam-heating the traction-wheels in order to cause the formation of an ice road for the wheels to run upon, it being understood that the snow is melted by heat from the wheels and that owing to the extreme cold in the lumber regions the melted snow will be almost instantly converted into ice.

A feature of my present improvement consists in dispensing with the use of steam as a heating agent and employing in place thereof a burner for any suitable burning fluid, in which way the flame from the burning fluid can be used instead of steam. By thus heating the wheels the exhaust-steam can be used for other purposes—such, for example, as creating a draft—or in place of injecting a portion of the exhaust into the wheels and a portion into the hood which forms a chamber in which the wheels are arranged the entire exhaust can be injected into such chamber.

A further feature of my invention consists in providing a shifting or sliding connection between the engine-truck frame and runners, so that in rounding curves the runners will remain in the track.

A further feature of my invention consists in means for permitting the traction-wheels (or wheel, should one be employed) to rock or tilt laterally independently of the engine-truck and to permit the truck to rock or tilt laterally independently of the traction-wheels; also, to provide between the traction propelling attachment and the truck a connection serving to allow the rear end of the truck and the forward end of the traction propelling attachment to rise and fall independently of each other, so as to accommodate the parts to any unevenness in the road.

A further feature consists in means for lubricating the power-transmitting device employed for driving the traction wheel or wheels from the engine.

Further features consist in details of construction, all as hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents in side elevation a tractor embodying certain features of my invention. Fig. 2 represents a transverse section on line 2 2 in Fig. 1 with parts removed. Fig. 3 is a section through one construction of traction-wheel which can be employed. Fig. 4 is a top plan of the rear portion of the machine of Fig. 1 with the tank 4 omitted. Fig. 5 is a section through another construction of traction-wheel. Fig. 6 represents on a larger scale a vertical section taken on line 6 6 through the traction propelling attachment of Fig. 4 with the gearing received within an oil-box. Fig. 7 is a top plan of Fig. 6 with the cover or upper half of the oil-box removed, the sides 20 of the traction propelling attachment being in this figure connected with the draw-bars 21 by hinge-joints. Fig. 8 represents the traction propelling attachment and rear portion of the engine-truck in side elevation and mainly serves to illustrate a working bearing F on the engine-truck and a sliding connection between the frame or body of the traction propelling attachment and the rear end of the engine-truck. Fig. 9 is a section on line 9 9 in Fig. 8, looking in the direction of the arrows therein shown, with cover removed. Fig. 10 is a view similar to Fig. 6, but shows the gears 17 and 18 connected by a chain or link belt. Fig. 11 is a top plan of Fig. 10 with the cover or upper portion of the oil-box removed.

The tractor represented in Fig. 1 is generally similar to that shown in my said patents and need not, therefore, be herein particularly described, it being sufficient to here note that the engine-truck frame A, which carries the engine B and boiler-furnace C, is supported upon runners 1 and 2, and that the engine-truck as a whole is advanced by the traction propelling attachment D, having a couple of traction-wheels 3, which are driven from the engine through the medium of a power-transmitting connection.

The reservoir for the burning fluid (which may be gasoline, oil, or any other flammable fluid) can be supported in any suitable way and upon any suitable portion of the tractor external to the hollow traction-wheel, and while I have herein shown a reservoir 4, supported from and over the frame of the traction propelling attachment, it is understood that said reservoir can be supported upon the engine-truck frame, if so desired.

In Figs. 1 and 5 I have illustrated a pipe 5 leading from the reservoir and provided at its lower end with a burner 6^a, which is arranged to enter one of the traction-wheels, it being understood that a pipe and burner can be thus allotted to each wheel. The traction-wheel shown in Figs. 1 and 3 is an open wheel; but in Fig. 5 I have shown a traction-wheel similar to that embodied in my application for Letters Patent of the United States filed December 17, 1888, and serially numbered 293,892. The wheel 3 in Fig. 5 is as in said application chambered by reason of the stationary end plates 6 and in connection with the burner constitutes a preferred arrangement. The frame or platform of the engine-truck has a sliding connection with the rear runners 1, so that in rounding curves the rear portion of the truck frame or platform can shift laterally either way, according to circumstances.

In Fig. 2 I have shown the king-bolt 7 secured to the truck-frame and passing through a slot 8 in the cross-beam 9 for the rear runners, and in order to permit the truck-frame to shift with ease I provide between the truck-frame and the cross-bar 9, which may be considered as a part of the runners, two or more rollers 10. The rollers 10 can be journaled in bearings upon either the truck-frame or the runners, and the king-bolt or pivot can, if desired, be secured to the cross-bar 9 and extended up through a slot in the truck-frame. By such arrangement in rounding a curve the runners will remain in the track, while the rear portion of the truck-frame will shift to one side or the other, according to the direction of the curve.

In certain of the figures the shaft 11, which is supported upon the engine-truck frame and driven from the engine, is gear-connected with the axis 12 of the traction-wheels. I have herein (except in Figs. 10 and 11) provided for this purpose the three gear-wheels 13, 14, and 15. The gear-wheel 14 is an intermediate gear-wheel which serves as a connection between the gear 13 on the traction-wheel axle and the gear 15 on the shaft 11. The journals of the intermediate gear-wheel 14 are mounted in bearings E, which are supported upon the shaft 11 and the axle 12. To prevent breakage and to adapt said bearings to such lateral rocking action as the traction propelling attachment may have during operation, I provide each bearing with a swiveled joint 16, in which way the bearings, while supporting the intermediate gear, will

readily adapt themselves to any side tilt or twisting movement which the traction propelling attachment may have during its advancement. The bearings E, having swivel-joints 16, can also be used in machines in which a sprocket 17 on the traction-wheel axle is connected with and driven from a sprocket 18 on the shaft 11 by a chain 19, as in Figs. 10 and 11, it being observed, however, that in such case the bearings E become the connections or braces between the shaft and axle, for the reason that the gear 14 being absent they are of course not needed as bearings or supports therefor.

As a further feature of improvement, serving to permit the lateral rock of the traction propelling attachment, I have in Figs. 8 and 9 shortened the shaft 11 and mounted it in a rocking bearing F, which is arranged upon the engine-truck. Said bearing is arranged to rock laterally to the length of the machine and is conveniently made yoke-shaped, although it may be of other suitable or desired form. With such arrangement the gear 15 can be driven from the engine by suitable power-transmitting connection. In said Figs. 8 and 9 the shafts or sides 20 of the propelling attachment, in place of being jointed to the draw-bars 21, as in my patent, No. 426,006, are arranged so that their forward ends shall abut against the rear end of the draw-bars, and as a preferred arrangement I provide their ends with anti-friction rollers 22, which bear against the ends of the bars; or, if desired, the rollers could be on the draw-bars, the result in either case being practically the abutting of the forward end of the traction propelling attachment against the rear end of the engine-truck, so as to provide between the same a sliding connection which will in no wise prevent the rocking action of the engine-truck independently of the traction-wheels or the tilt of the traction-wheels independently of the engine-truck.

In certain of the figures I have shown an oil-box G, arranged to contain a lubricant for the power-transmitting connection between the shaft on the engine-truck and the axle of the traction wheel or wheels. The oil-box can be hung at one end upon shaft 11 and at its opposite end hung upon the axle of the traction-wheels, and, if desired, it can be employed in connection with gearing between the shaft and axle, as in Figs. 6 and 7. The oil-box is, however, more important in machines in which the traction-wheels are driven by the chain or link belt 19, as in Figs. 10 and 11. In said figures the box is hung upon shaft 11 and axle 12, and serves to inclose the gears 17 and 18 and the link belt which serves to connect them. By such arrangement the power-transmitting device can be kept well lubricated and also will be protected by the casing or box G. By reason of the inclined position of the oil-box the lubricant may fill a certain portion of the lower end of the chamber within the box. It may also be noted that

the lower leaf of the link belt will sag somewhat, as in Fig. 10, whereby with a comparatively small quantity of oil in the box the link belt can dip into the same.

5 What I claim as my invention is—

1. The combination, in a tractor for forming ice roads and hauling logs over the same, of a hollow traction-wheel arranged for forming the road-bed and adapted when heated to melt down the snow, so as to permit the conversion of the same into an ice road, and a fluid-burner connected with a suitable source of supply external to said wheel and arranged to apply its flame within the wheel as
15 a means for heating the same.

2. In a tractor for the purpose set forth, the combination, with the rear runners, of the engine-truck frame having a sliding connection therewith, for the purpose described.

20 3. In a tractor for the purpose set forth, the combination, with the traction-wheels and a rotary shaft driven from the engine, of the gears constituting a power-transmitting connection between said shaft and traction-
25 wheels, and the bearings E, supporting one of the gear-wheels and having swiveled joints, substantially as and for the purpose set forth.

4. In a tractor for converting snow roads into ice roads and drawing loads over the same, the combination, with the hollow wheel closed by stationary end plates G, of a burner
30 arranged within the wheel and connected with

a suitable source of supply, substantially as set forth.

5. The combination, substantially as here- 35 inbefore set forth, with an engine-truck, of a traction propelling attachment comprising one or more traction-wheels, suitable power-transmitting connection between the traction wheel or wheels in the traction propelling at- 40 tachment and a driving-shaft on the engine-truck, and a rocking bearing mounted upon the engine-truck and supporting said driving-shaft, for the purpose described.

6. The combination, with an engine-truck, 45 of a traction propelling attachment comprising one or more traction-wheels connected by suitable power-transmitting connection with driving-power on the engine-truck, and sides or shafts 20, abutting at their forward ends 50 against the engine-truck and having a sliding connection therewith, for the purpose described.

7. The combination, with a traction propelling attachment comprising one or more trac- 55 tion-wheels gear-connected to the power on the engine-truck, of an oblong inclined oil-box inclosing said gears, one of said gears being arranged to dip into the lubricant in the lower front end of said inclined oil-box.

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