Jan. 16, 1923. 1,442,570

P. E. HOLT.

DETACHABLE TRACTOR UNIT FOR GUN MOUNTS.

ORIGINAL FILED MAY 22, 1918. 3 SHEETS-SHEET 1

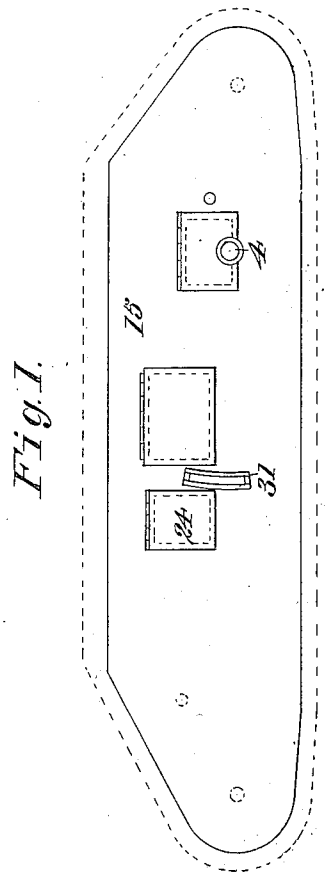


Fig. 1.

Fig. 2.

Inventor Pliny E. Holt

By Strong & Townsend Attys

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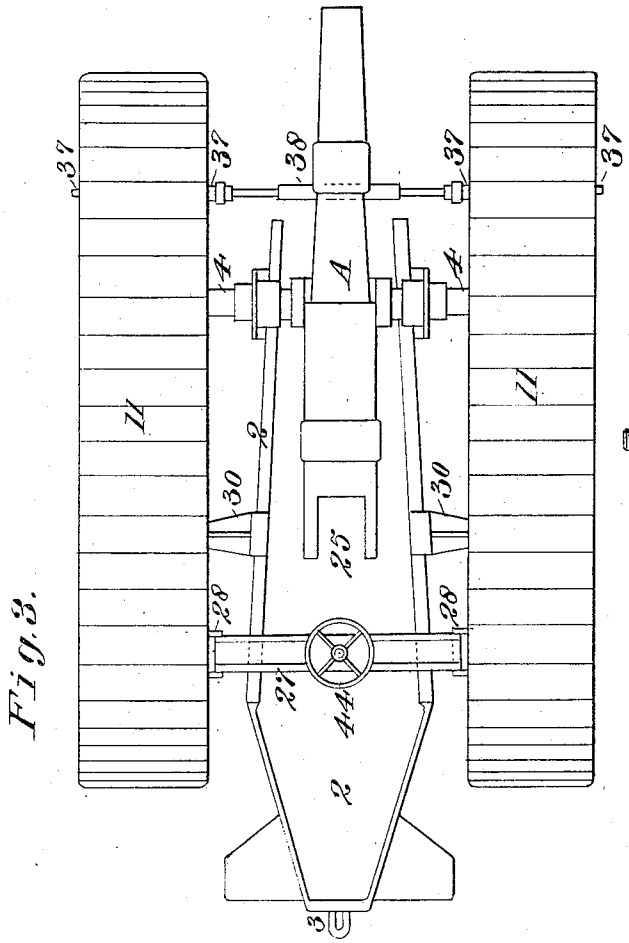


Fig. 3.

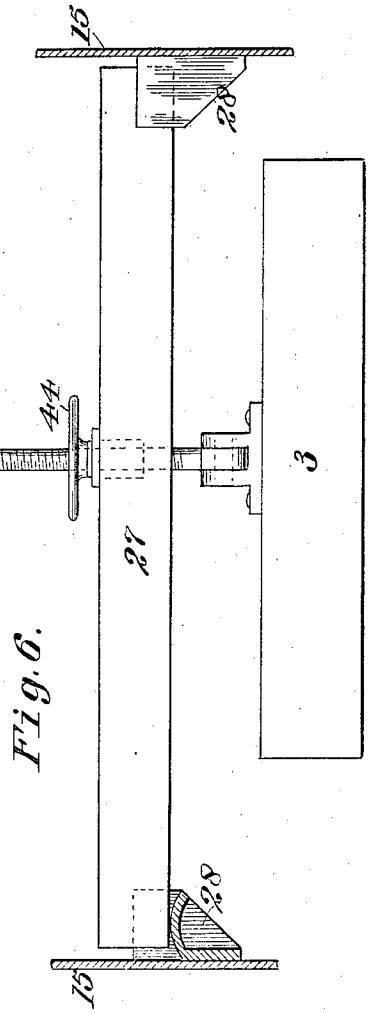


Fig. 6.

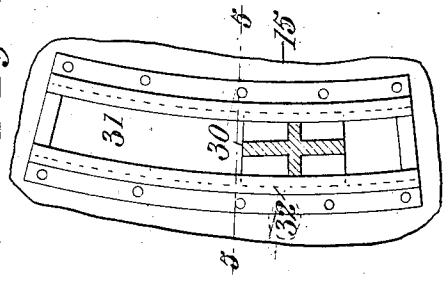


Fig. 4.

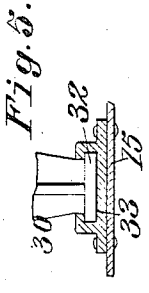


Fig. 5.

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DETACHABLE TRACTOR UNIT FOR GUN MOUNTS.

ORIGINAL FILED MAY 22, 1918. 3 SHEETS-SHEET 3

Fig. 7.

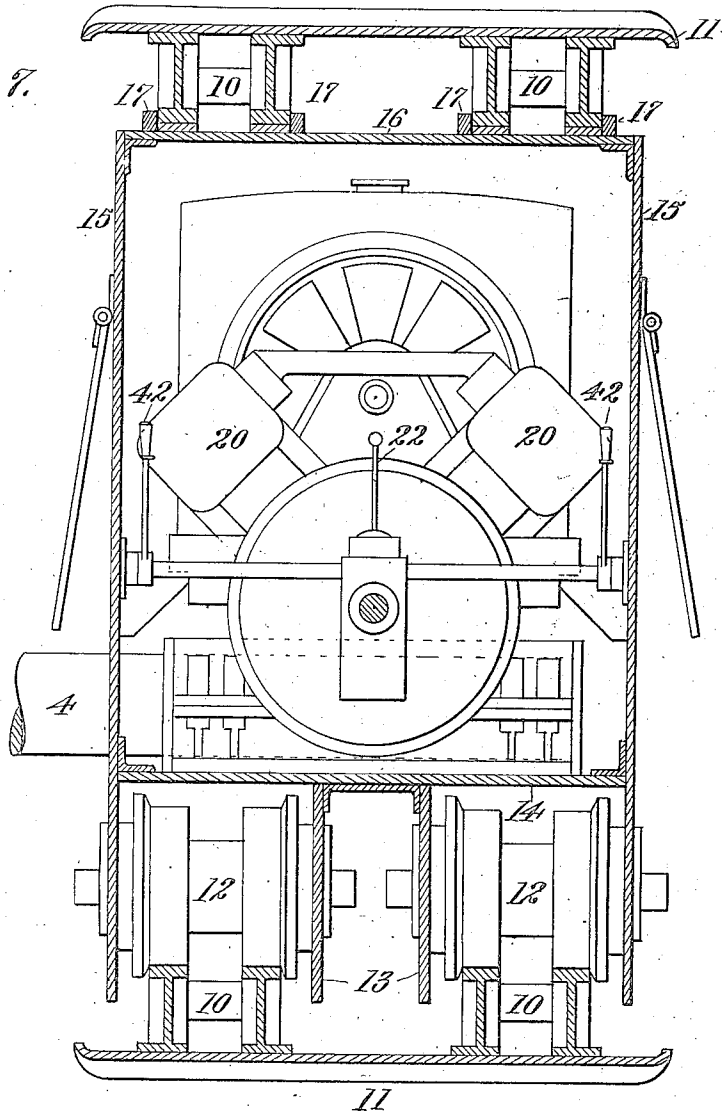
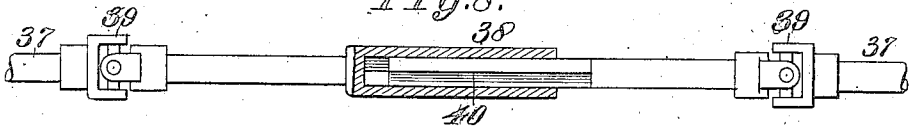


Fig. 8.



INVENTOR.

Pliny E. Holt

BY

Strong & Townsend

ATTORNEYS

Patented Jan. 16, 1923. 1,442,570

UNITED STATES PATENT OFFICE.

PLINY E. HOLT, OF STOCKTON, CALIFORNIA, ASSIGNOR TO THE HOLT MANUFACTURING COMPANY, OF STOCKTON, CALIFORNIA, A CORPORATION OF CALIFORNIA.

DETACHABLE TRACTOR UNIT FOR GUN MOUNTS.

Application filed May 22, 1918, Serial No. 235,964. Renewed July 2, 1921. Serial No. 482,192.

To all whom it may concern:

Be it known that I, PLINY E. HOLT, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented new and useful Improvements in Detachable Tractor Units for Gun Mounts, of which the following is a specification.

This invention relates to an independent detachable tractor unit for a gun mount to be used in place of the regular round wheels on each side of the gun carriage; the idea being to develop a self-propelled gun unit out of the regular equipment now in use.

A particular object is to construct a self-propelled gun mount that will travel in a forward direction, so that when traveling normally on the road, the gun will be pointed forwardly, instead of rearwardly as in general practice, which will materially reduce the time required normally to move the gun from one firing position to another and thereby facilitate the handling of the equipment.

Briefly, each unit consists of an endless chain track of special design and an elongated truck frame, with the motor, transmission and control units, and features, such as radiators, tanks, etc., mounted inside of the tractor belt, each one of the units to be interchangeable with each other. In other words, all the control levers and mountings are to be in duplicate on each side of each tractor unit, so that either one of the two units, comprising the complete machine, may be used on either side of the gun carriage.

The two motors have a counter shaft extending from the front of the motor to a bevel gear set connected to a short cross shaft, which cross shaft will be connected by a shaft connecting the two units, comprising two universals with slip joints between the two universals, so that the two motors will be coupled together and act in unison. The steering of the tractor is controlled by the main steering friction between the motor and the gear box.

The motor equipment, as shown in the drawings, consists of a "Cadillac" 8-cylinder motor and transmission set, though any self-contained motor unit may be used in place of this set.

The front end of the gun carriage is mounted on a straight axle which is substituted for the crank axle used on a regular gun carriage. The rear end of the gun carriage is mounted on an equalizing bar resting on brackets on each side of the tractor unit and supported by a hanging screw and hand-wheel which will lift the rear end of the gun carriage off of the ground when traveling.

Having reference to the accompanying drawings:

Fig. 1 is a diagrammatic view, showing the contour of the tractor unit.

Fig. 2 is a view with the side plate removed, showing the power unit.

Fig. 3 is a plan view of two tractor units with the gun mounted between same.

Fig. 4 is a detail view of the quadrant and outrigger on the gun carriage.

Fig. 5 is a horizontal section on line 5—5 of Fig. 4.

Fig. 6 is an elevation of the cross bar support for the rear end of the gun carriage.

Fig. 7 is a vertical, transverse section through the tractor.

Fig. 8 is a detail view of the motor connecting shaft.

The gun to be transported is indicated at A, this gun being trunnioned in the usual fashion on its carriage 2 which terminates in the rear in the usual tail-piece 3. 4 is the carriage axle which is supported at its ends on self-propelled chain track units, one of which units is disposed at each side of the gun. Each unit includes an endless chain track, consisting of a double parallel series of conjoined links 10, mounted on overlapping track shoes 11 and having rail heads for the pairs of rollers 12 to run on. In short, owing to the fact that the weight is so great, these tracks are of considerable width and require a double set of rail members for the corresponding double set of rollers 12; the rollers 12, as before stated, being arranged in pairs side by side and suitably journaled on the underside of a correspondingly broad and substantial elongated truck frame 13.

This truck frame 13 is of special construction and is built up of heavy structural shapes with a floor portion 14, reinforced side walls of sheet metal 15, and a top plate 16. On the top of the top plate 16 are provided

suitable guides 17 for the return overhead run portions of the tracks 10. Double drive sprockets are suitably journaled at the rear ends of the trucks for the chain track to pass over; there being corresponding front idlers 19 for the chain track at the forward end of the truck. The space within each truck forms a housing and support for the motor 20, transmission 21, control lever 22, and drive connections, generally indicated at 23, to the rear sprocket. The control or shift lever 22 and all other levers are accessible from either side of the truck frame through an opening 24, at each side thereof; the opening 24 in the truck frame being opposite to each other so that the units comprising the complete machine may be used on either side of the gun carriage and the controls readily accessible from the operator's platform 25 on the gun carriage.

The gun carriage axle 4 is journaled directly on the lower girders of the truck frame, so that the gun carriage may be tilted in a vertical plane to allow the tailpiece 3 to be elevated, when traveling, and suitably supported on a cross timber 27 fitting in suitable brackets 28 on the sides of the truck housings when the mount is being moved; the pivotal action of the axle 4 on the trucks also allowing the tailpiece to be dropped and suitably anchored in the ground when in firing position. Likewise, the trucks are free to oscillate or move in vertical planes within necessary limits with respect to the gun carriage, the trucks having the axle 4 as their axis of oscillation. The trucks are guided in their vertical movement and maintained in parallelism and suitably spaced from each other and from the gun carriage by means of the outriggers 30, which project into segmental slots or quadrants 31 in the sides of the truck frame housings. These outriggers, which are fixed to the carriage, have cross heads 32 working in suitable slides 33 on the inside of the truck housings.

The two motors of the two chain track units are suitably coupled together to act in unison by means of a countershaft 35 which extends forwardly to the front of each motor to a bevel gear set 36, which in turn is connected to a short cross shaft 37. This cross shaft is connected by an intermediate shaft 38 which connects the two units by means of two universals 39 having slip joints 40 between the universals, so as to allow for the natural up and down movements of the two units in their travel over the train.

The cross shaft 37, on each tractor unit, projects slightly beyond the side of the tractor unit and has a complementary end for readily coupling with a universal 39. This is for the purpose of allowing a unit to be used on either side of the gun carriage. Likewise, it is understood that the axle 4 is insertible is into its bearings on the truck frame from either side of the latter.

The steering of each tractor unit is controlled from the lever 42 by the main steering friction clutch 43 disposed between the motor and the gear box. The raising and lowering of the rear end of the gun carriage is effected by a suitable screw and hand-wheel mechanism indicated at 44.

From the foregoing it will be seen that each chain track unit comprises a self-contained traction engine, each with its own power plant and operating mechanism, but the two tractors are so harnessed together and controlled by a single operator positioned between them that they operate in unison. By this construction and arrangement the gun and the gun mount will always move in a forward direction instead of the gun always pointing to the rear as where it is pulled by a traction engine. If the gun is to be advanced it advances pointing in the direction in which it is to shoot and if a retirement is necessary it can be easily backed out of the difficulties.

It is obvious that various changes may be made in the details of construction and in the form and proportions of the parts without in any wise departing from the spirit of the invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A detachable tractor unit for gun mounts, consisting in the combination with a gun and its carriage, of a pair of independent, detachable, self-laying track tractor units, one arranged at each side of the gun carriage and supporting the same, a self-contained power plant for each tractor unit and means by which either unit may be applied to either side of the gun carriage.

2. A detachable tractor unit for gun mounts, consisting in the combination with a gun and its carriage, of a pair of independent, detachable, self-laying track tractor units, one arranged at each side of the gun carriage and supporting the same, means by which either unit may be applied to either side of the gun carriage, a driving motor for each unit and means by which the motors of the two units may be coupled together to act in unison.

3. A detachable tractor unit for gun mounts comprising, in combination with a gun and its carriage, a pair of detachable chain tractor units, one unit at each side of the gun carriage and on which the carriage is mounted, each unit embodying a self-contained power plant and driving means, and means by which the power plant of the two units may be coupled together to act in unison.

4. A detachable tractor unit for gun

mounts comprising, in combination with a gun and its carriage, a pair of detachable chain track tractor units, one unit at each side of the gun carriage and on which the carriage is mounted, each unit embodying a self-contained power plant and driving means, means by which the power plant of the two units may be coupled together to act in unison, and means by which one operator may control both units.

5. A detachable tractor unit for gun mounts comprising, in combination with a gun and its carriage, a pair of detachable chain track tractor units, one unit at each side of the gun carriage and on which the carriage is mounted, each unit embodying a self-contained power plant and driving means, means by which the power plant of the two units may be coupled together to act in unison and individual control means for each unit accessible from the gun carriage.

6. A detachable tractor unit for gun mounts comprising, in combination with a gun and its carriage, a pair of detachable chain track tractor units, one unit at each side of the gun carriage and on which the carriage is mounted, each unit embodying a self-contained power plant and driving means, and means by which the two units may be coupled together to act in unison, the gun carriage mounted for pivotal motion in a vertical plane with means on the gun carriage cooperating with the tractor units for maintaining the latter in parallelism.

7. A tractor mount for guns comprising, in combination with a gun and its carriage, a pair of detachable self-laying track tractor units on which the gun is mounted and by which it is propelled, each unit having a self-contained power plant, and control means, said units and gun carriage constructed and arranged whereby a single operator may control both units, the control means for each unit being accessible from a position on the carriage.

8. In a gun mount, the combination with a gun and its carriage, of a pair of chain track tractor units, one arranged at each side of the carriage and on which the latter is mounted for pivotal movement in a vertical plane, and means on the carriage engaging with the tractor units to form guides to maintain the units in parallelism.

9. In a gun mount, the combination with a gun and its carriage, of a pair of chain track tractor units, one arranged at each side of the carriage and on which the latter is mounted for pivotal movement in a vertical plane, means on the carriage engaging with the tractor units to form guides to maintain the units in parallelism, and means carried by the tractor units for sustaining the tail-piece of the gun carriage when the gun is traveling.

10. In a tractor unit for gun mounts, the combination of a truck frame forming a housing for a power plant and transmission set, in combination with an endless chain track having a double set of rail members, the underside of the truck being provided with a corresponding double set of truck rollers running on the double rail members, corresponding rear sprockets and front idlers for the track, with the track returning over the top of the truck, a similar and corresponding tractor and traction unit, a gun supported between the two units, and connections between the units to cause them to operate in unison at the same time permitting each unit to rock in a vertical plane.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PLINY E. HOLT.

Witnesses:
JOHN H. HERRING.
W. W. HEALEY.