

Nov. 3, 1925.

1,559,880

P. D. IONIDES

CRANE

Filed Jan. 2, 1923

2 Sheets-Sheet 1

FIG. 1.

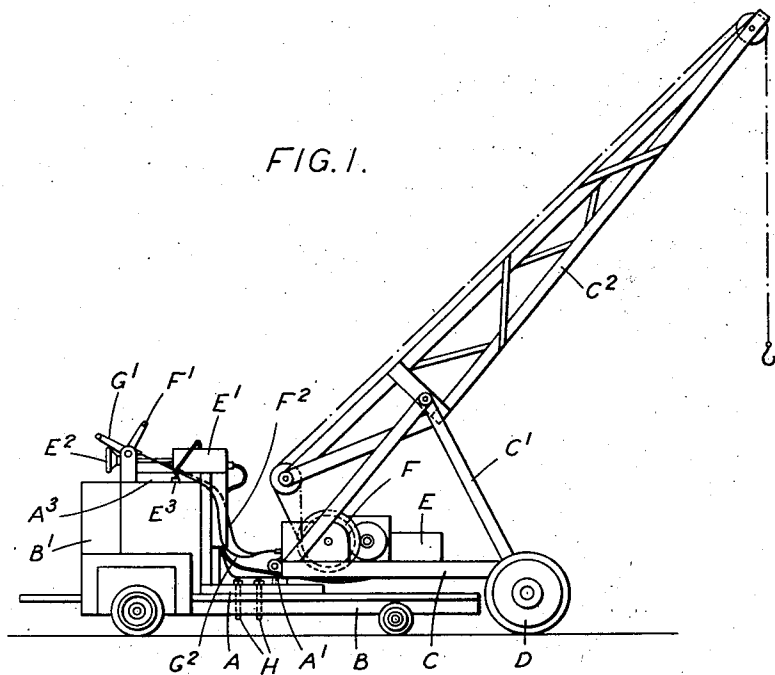


FIG. 3.

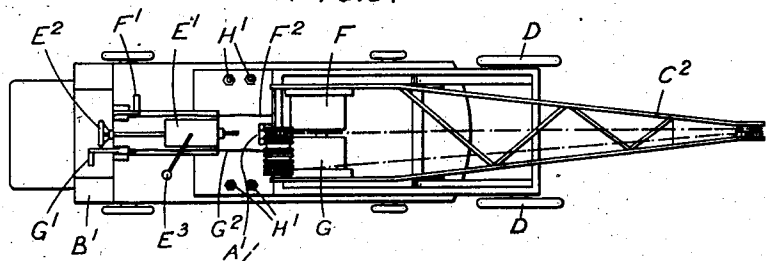
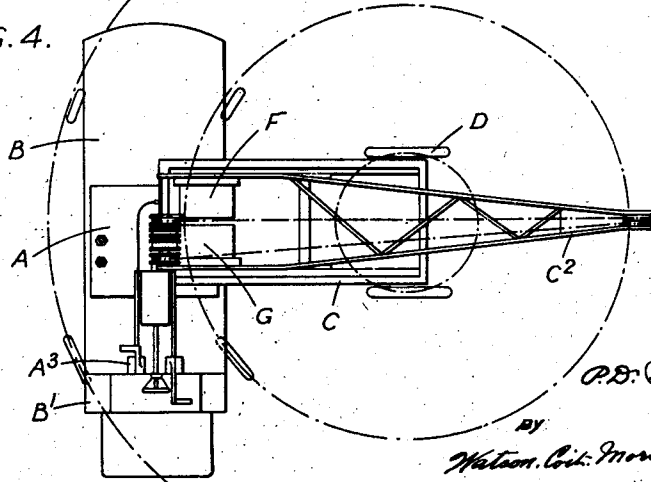


FIG. 4.



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2 Sheets-Sheet 2

FIG. 2.

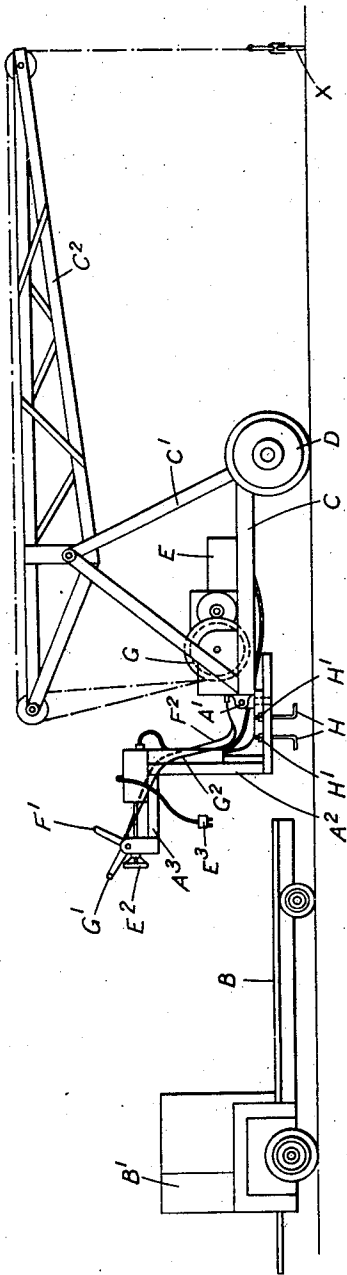


FIG. 6.

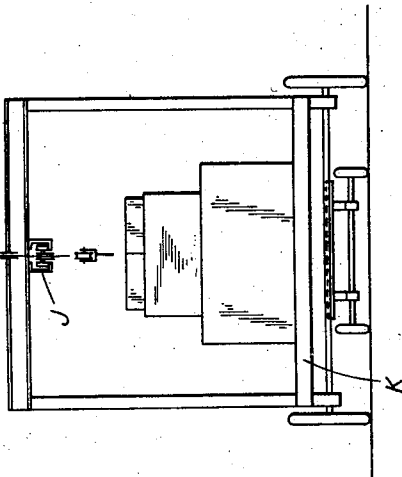
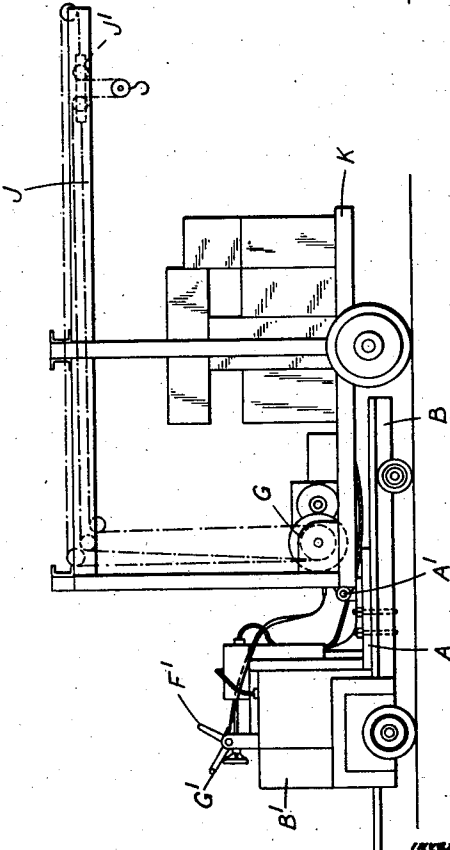


FIG. 5.



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UNITED STATES PATENT OFFICE.

PHILIP DENIS IONIDES, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO RAN-
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CRANE.

Application filed January 2, 1923. Serial No. 610,355.

To all whom it may concern:

Be it known that I, PHILIP DENIS IONIDES, a subject of the King of England, and residing at London, in England, have invented certain new and useful Improvements in Cranes, of which the following is a specification.

This invention relates to cranes and in particular to relatively small cranes suitable for general use in warehouses and workshops or on quays where space is limited and the crane has to be manoeuvred to avoid obstacles when travelling.

A locomotive crane may travel upon roads or rails the crane itself being adapted to rotate relatively to the truck or platform upon which it is mounted. It has already been proposed to mount a crane in a permanent manner upon an electrically propelled truck or vehicle of special design and to manoeuvre the truck as a whole when slewing the crane instead of rotating the crane upon its platform or truck as in the usual locomotive type of crane.

The object of this invention as distinct from the above types is to provide a crane for lifting purposes only or for lifting and carrying purposes which can be disconnected from its truck when not in use thus leaving the truck free for employment as such, the crane when detached being so arranged as to be readily connected again to the truck when it is required for use.

To this end, according to this invention, a crane unit is provided which can be readily connected to and supported by the truck thus forming a locomotive crane deriving its motive power from the truck. Preferably the crane is mounted upon two wheels and can be coupled to the truck by a single pivotal connection in such a manner that it is provided with a three-point support, the frame or platform of the crane on which the hoisting and luffing mechanism is mounted or upon which goods may be carried conveniently overlapping the truck which thus supports its weight. The pivotal connection is preferably in the form of a ball and socket joint and the construction of the joint or of its supporting members is such that the crane unit can be attached to the truck or

removed therefrom without necessitating any alteration in the design of the truck.

The invention is primarily intended for use in connection with the known type of electrically propelled trucks which can be readily manoeuvred in restricted places and are provided with means for simultaneously steering both front and rear wheels. When therefore a two-wheeled crane in accordance with this invention is coupled to the truck the latter can be employed either to push or pull the crane or the truck can be turned at right angles to the crane jib which can then be slewed if the truck is made to travel in a circular path.

Not only is the crane manoeuvred in the manner described by the truck but further where, as is preferred, the hoisting and luffing mechanism of the crane is provided with an electric motor, this motor derives its energy from the storage batteries by means of which the truck is propelled. Flexible conductors or other means are therefore provided by which, after the crane unit has been connected to the truck, the crane motor can be coupled to the truck cells, means for controlling the winding and luffing mechanism being also provided which can be connected to the truck simultaneously with the crane. Alternatively the controller by which the truck propelling motion is operated may be arranged also to control the motion of the crane by suitable connections.

When it is desired to disconnect the crane from the truck, for example when the truck is to be used as such without the crane, the tail of the crane can be readily lifted clear of the truck and maintained in such a raised position by connecting the hoisting hook to a ring bolt or the like secured to the floor and then winding up the hoist, if necessary after scotching the wheels of the crane. The truck can then be moved clear of the crane, or if it is to be reconnected, back thereunder without difficulty or the provision of any special lifting gear or jacks.

Two constructions of crane in accordance with this invention are shown somewhat diagrammatically in the accompanying drawings in which—

Figure 1 is a side elevation showing a

two-wheeled crane having a cantilever jib connected to an electrically propelled run-about truck.

Figure 2 is a side elevation showing the crane detached from the truck which is free for use as such while the crane remains ready for future use with the truck.

Figure 3 is a plan showing the position of the crane and truck for travelling either forwards or backwards.

Figure 4 is a plan showing the turning circle of the combined truck and crane when the latter is to be slewed.

Figure 5 is a side elevation of a modified construction in which the jib comprises a horizontal runaway having a travelling jenny thereon, and

Figure 6 is a rear end view of the crane shown in Figure 5.

In both constructions the crane is provided with a base plate or bed A adapted to be connected in a detachable manner to the chassis or platform B of the truck.

In the arrangement shown in Figures 1-4 the crane comprises a frame C the outer end of which is supported upon a pair of wheels D while at or near its inner end the frame is connected to the bed plate A by means of a pivotal joint A' of the universal type. The frame C carries standards C' which support a cantilever jib C².

The mechanisms for hoisting the load and derricking the jib in themselves form no part of the present invention but preferably a single motor E is mounted on the frame C near the pivot A' adapted to drive either the hoisting mechanism F or the derricking mechanism G or both these mechanisms together, in a preferred arrangement brakes being provided which automatically hold the inoperative mechanism against movement.

Mounted on the base plate A are vertical standards A² carrying a table A³ adapted to overlap the battery casing B' of the truck B. The table A³ carries a controller E' for the motor E and levers F' G' for actuating the hoisting and derricking mechanisms respectively, Bowden wires F² G² or like flexible power transmission mechanisms being provided between the levers and the members they respectively operate. The controller E' has an actuating wheel E² and this wheel and the levers F' and G' are all conveniently placed for the driver of the truck as they are adjacent to the ordinary truck steering and control mechanism.

Any convenient means may be used to connect the bed plate A of the crane to the frame or chassis of the truck but in the particular instance shown L-shaped bolts H are provided at the sides of the bed plate which can be made to engage the under-surfaces of the truck side frames and thus firmly clamp it and the bed plate together when nuts H' at the upper ends of these

bolts are tightened. A flexible conductor E³ connected to the motor E has then only to be coupled with the truck cells and the crane is ready for use.

The alternative construction illustrated in Figures 5 and 6 differs only from that above described in that a horizontal runaway J is used instead of a cantilever jib and a platform K takes the place of the frame C. The general arrangement of the hoisting and derricking mechanism together with their driving motor is similar to that already described and this mechanism is controlled from the table A³, the control lever F' as before actuating the hoist and the lever G' actuating the mechanism for causing the jenny J' to travel along the runaway J. With such an arrangement packages lifted by means of the hoist can be transferred on to the platform K.

If it is desired to disconnect the truck from the crane so that the truck may be used as such the crane hook is attached to a ring bolt or some other anchor as indicated at X in Figure 2 and the hoist is actuated until the crane and its bed (which has previously been released by disengaging the L-shaped bolts from the truck B) rises a short distance above the platform of the truck. It is then only necessary to break the electrical connection between the crane motor and the truck cells and the truck can be moved away leaving the crane in the position shown in Figure 2 ready for use and reconnection to the truck directly occasion arises. It is not even necessary to scotch the wheels of the crane while it remains in the position shown in Figure 2. In Figures 3 and 4 the motor and certain parts of the winding mechanism or its casing are omitted to render the general arrangement of the crane and truck less confused.

The crane can be either pushed or drawn by the truck and it will be seen from Figure 4 that the crane can be turned in a relatively small circle more especially where the truck is of the type in which all four wheels are adapted to steer.

The crane in accordance with this invention though primarily provided with two wheels in the manner described in certain cases may, if desired, be provided with some collapsible form of leg or pivot the arrangement being such that this leg can be folded up and the crane supported wholly by the truck platform when travelling, the leg or pivot being folded down to engage the ground if and when the jib is to be slewed. Alternatively the axle of the crane wheels can be pivotally connected to the crane platform and means provided whereby the axle can either rotate about this pivot or be locked to the crane platform in accordance with requirements. With such an arrangement it would be possible when the crane was

detached from the truck and installed upon some stationary supporting platform to make limited use of the crane by drawing current from some source other than the truck.

Although the truck described in the particular example above given is of the known four wheel type having a flat rearwardly extending platform, it is, however, to be understood that a crane unit of suitable shape and dimensions can be connected to any other form of self-propelled vehicle truck, for example, a lorry or a truck having only three wheels and that the particular form of attachment and other details of construction can be considerably varied without departing from this invention.

What I claim as my invention and desire to secure by Letters Patent is:

1. A detachable crane unit adapted for use with a self-propelled vehicle, comprising in combination, a frame, two wheels supporting one end of said frame, a jib mounted on the frame, hoisting and luffing mechanism car-

ried by the frame, a bed plate for the frame, a universal pivotal connection between the bed plate and the end of the frame remote from the wheels, and readily detachable means for connecting the bed plate to the vehicle.

2. A detachable crane unit adapted for use with a self-propelled vehicle, comprising in combination, a frame, two wheels supporting one end of said frame, a jib mounted on the frame, hoisting and luffing mechanism carried by the frame, a bed plate for the frame, a universal pivotal connection between the bed plate and the end of the frame remote from the wheels, readily detachable means for connecting the bed plate to the vehicle, and a table rigidly connected to the bed plate adapted to support the controls for the hoisting and luffing mechanism on the frame.

In testimony whereof I have signed my name to this specification.

PHILIP DENIS IONIDES.