

July 22, 1930.

G. JORET

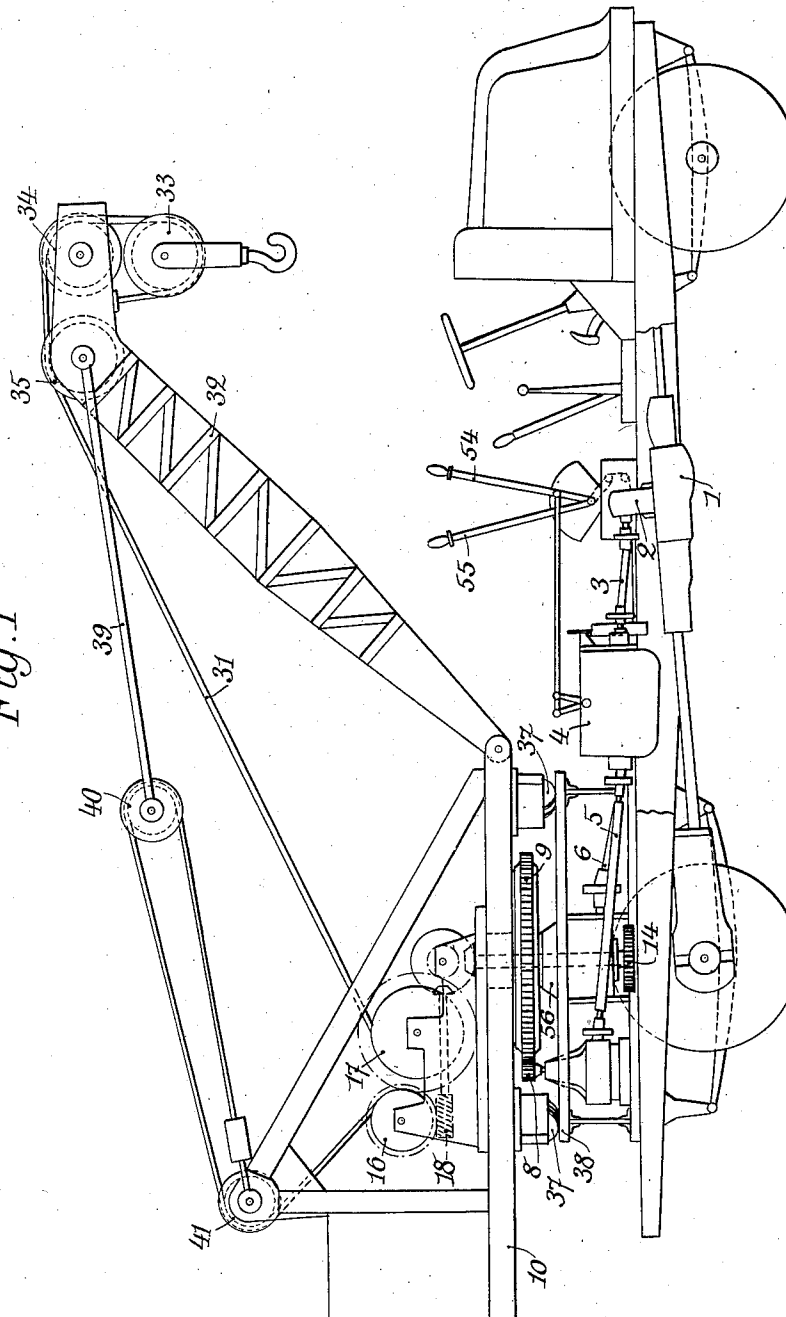
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CRANE FOR INSTALLATION ON MOTOR VEHICLES

Filed Jan. 7, 1928

2 Sheets-Sheet 1

Fig. 1



Inventor:
G. Joret.
By Langner, Perry, Hard & Langner
Attys.

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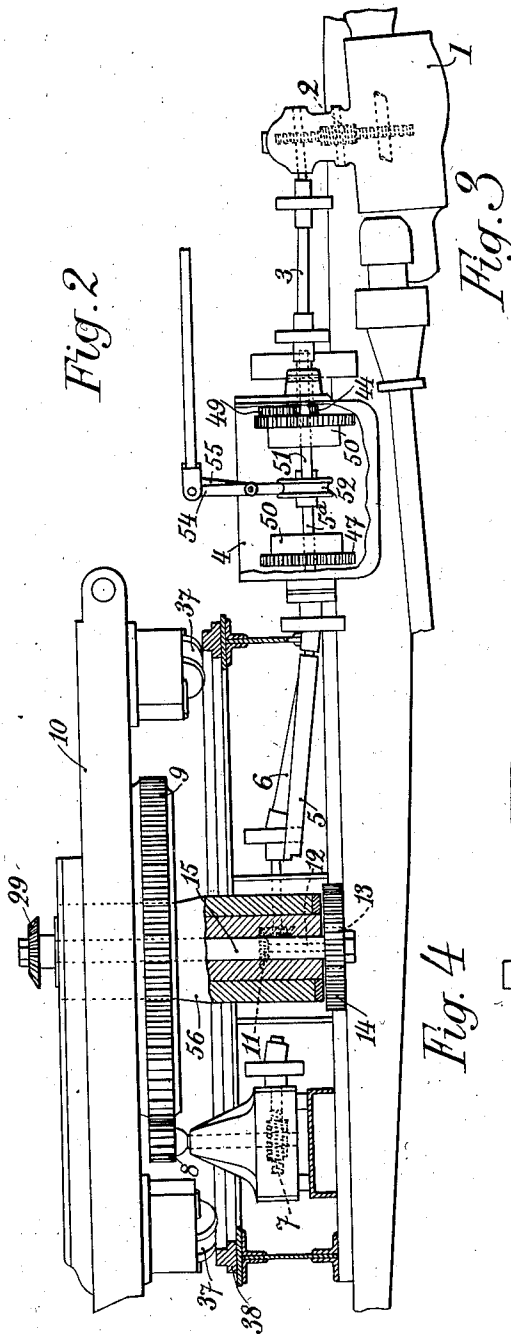
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UNITED STATES PATENT OFFICE

GUSTAVE JORET, OF PARIS, FRANCE

CRANE FOR INSTALLATION ON MOTOR VEHICLES

Application filed January 7, 1928, Serial No. 245,181, and in France January 31, 1927.

The present invention relates to a crane mounted upon a vehicle frame, in which the several mechanical parts are reduced to the simplest form, and are so constructed as to provide for inspection and upkeep in the most approved manner.

The operative parts of the said crane are controlled from the change-speed housing of the vehicle, with the interposition of a reversing mechanism from which extend two shafts rotatable in either direction at will. One of these shafts controls the rotation of the entire crane about its pivot, and the other shaft acts through suitable clutches to operate the winches for raising the jib or arm of the crane and for lifting the load.

The appended drawings show by way of example an embodiment of the invention.

Fig. 1 is a general view in side elevation of the apparatus.

Fig. 2 is a view in side elevation of the same on a larger scale, with parts in section.

Fig. 3 is a plan view of the reversing device.

Fig. 4 is a plan view of the winch gear.

The crane is installed upon a frame of heavy construction; the engine is placed at the front in the known manner, and the change speed gearing which is of the conventional type is arranged within a housing 1 and is provided with suitable gear 2 for the operation of the said crane.

A special device, not shown, serves to fasten the driving axles to the vehicle frame while the crane is in operation.

A shaft 3 transmits motion from the gear 2 by the interposition of Cardan joints, to reverse gear mechanism. The casing for the gearing is placed on the vehicle frame back of the driver's seat. From this casing extend two shafts 5 and 6 each of which can be rotated forward or back under the control of the driver.

The shaft 5 serves to turn the crane about, by means of worm gearing 7 which drives a pinion 8 coacting with a ring gear 9 secured to the revolving platform 10.

The shaft 6 acts through the medium of a pair of bevel gears 11 contained in a driving box upon a vertical shaft 12 which carries a

pinion 13 engaging a ring gear 14; said ring gear is keyed to the shaft 15 which traverses the pivot axle 56 of the crane and serves to drive the winches 16 and 17 by bevel and spur gearing, the said winches and gearing being mounted on the revolving platform.

The winch 16 for raising the crane arm of jib is connected by the worm gearing 18 with a shaft 19 carrying the bevel gear 20. This gear coacts with a pinion 21 which is loose on the shaft 22 but may be clutched for rotation with said shaft by a clutch sleeve 23.

The lifting winch 17 is connected by the spur gearing comprising the gear 24 and pinion 25 with a shaft 26 in line with the shaft 22.

The shafts 26 and 22 carry the respective bevel gears 27 and 28 which engage the pinion 29 keyed to the end of the shaft 15.

The lifting cable 31 is attached to the main beam 32 and is disposed upon the hook pulley 33 and upon two supporting pulleys 34 and 35.

The pivoting part of the crane comprises a rotating frame 10 of structural steel which is mounted on the rollers 37 which roll upon the fixed race or track 38 and which affords a great stability to the apparatus.

The main beam 32 of the crane is pivoted at its lower end to the frame 10 and is held in position by two stays 39 which are stiffened by a set of cables coacting with the supporting pulleys 40 and the pulleys 41. The reversing device comprises a driving shaft 42, carrying two spur gears 43 and 44, and two other parallel shafts 5^a and 6^a which are respectively connected with the shafts 5 and 6. Upon the shafts 6^a and 5^a are mounted the loose pinions 45 and 46, and 47 and 48.

The pinion 43 engages the pinions 45 and 47; while the pinion 44 engages the intermediate pinion 49 which engages the pinions 46 and 48 and turns them in the contrary direction to the pinions 45 and 47 respectively.

Each pinion 45 to 48 is secured to a respective drum 50 coacting with a clutch of the expanding type, not shown, which is placed in the said drum; and each clutch is controlled by a respective arm 51 forming a wedge and adapted to expand the friction

segments when it is inserted between their ends. The said arms 51 are mounted in pairs on the sleeves 52 and 53 slidable on keys upon the shafts 5 and 6, and under the control of the levers 54 and 55.

5 According as the sleeve 53 is connected with one of the pinions 45 or 46, the shaft 6 is turned in one or the other direction to raise or lower the load or—by means of the clutch 23—to raise or lower the main arm or jib of the crane.

10 The brake 57 mounted on the shaft 6^a and controlled by a pedal, not shown, serves to hold the load at any desired height. By connecting the sleeve 52 with one of the pinions 47 or 48, the shaft 5 can be turned in either direction so as to effect rotation of the support 10 and turn the arm or jib of the crane to the right or left.

20 Without departing from the invention, I may add to the gear for raising the load, a suitable clutch which is disposed for instance in such manner as to couple the shaft 26 with the pinion 27, so that the winch 17 can be disconnected and the winch 16 be operated alone. 25 I may further employ a brake which acts upon the control of the winch 16.

To conclude, my said apparatus according to the invention is advantageous not only as concerns the convenience of the operations effected from the driver's seat, but also as concerns the facility of access to the different parts of the mechanism which require inspection and upkeep. To this end the driving gear 2 is placed above the change speed box and the box 4 containing the reversing gear is easy of access at the top and sides. The different gears and clutches mounted on the pivoted platform are well in view on both sides and are easy of upkeep.

40 Having thus described my apparatus, what I claim as new therein, and my own invention, is:

In a device adapted for use on a crane and motor vehicle combination for transmitting the rotary motion of the motor vehicle engine to the movable members of a crane mounted upon the said vehicle, the combination of the transmitting and reversing mechanism of the usual changespeed box of the motor vehicle and of a transmitting and reversing mechanism adapted to control the lifting and orienting motions of the crane, the said mechanism comprising a primary shaft driven from the said change-speed box of the motor vehicle, two driving pinions on said primary shaft, two secondary shafts disposed parallel to the said primary shaft, two loose pinions mounted respectively on the said two secondary shafts and constantly in mesh with one of the said pinions of the primary shaft, two other loose pinions mounted respectively on the said secondary shafts, a supporting pinion meshing with the two last cited pinions and with the second pinion of

the primary shaft, and clutching devices adapted to individually couple the said pinions loosely mounted on the secondary shafts with the said shafts themselves, substantially as described.

In testimony whereof I have hereunto affixed my signature.

GUSTAVE JORET.

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