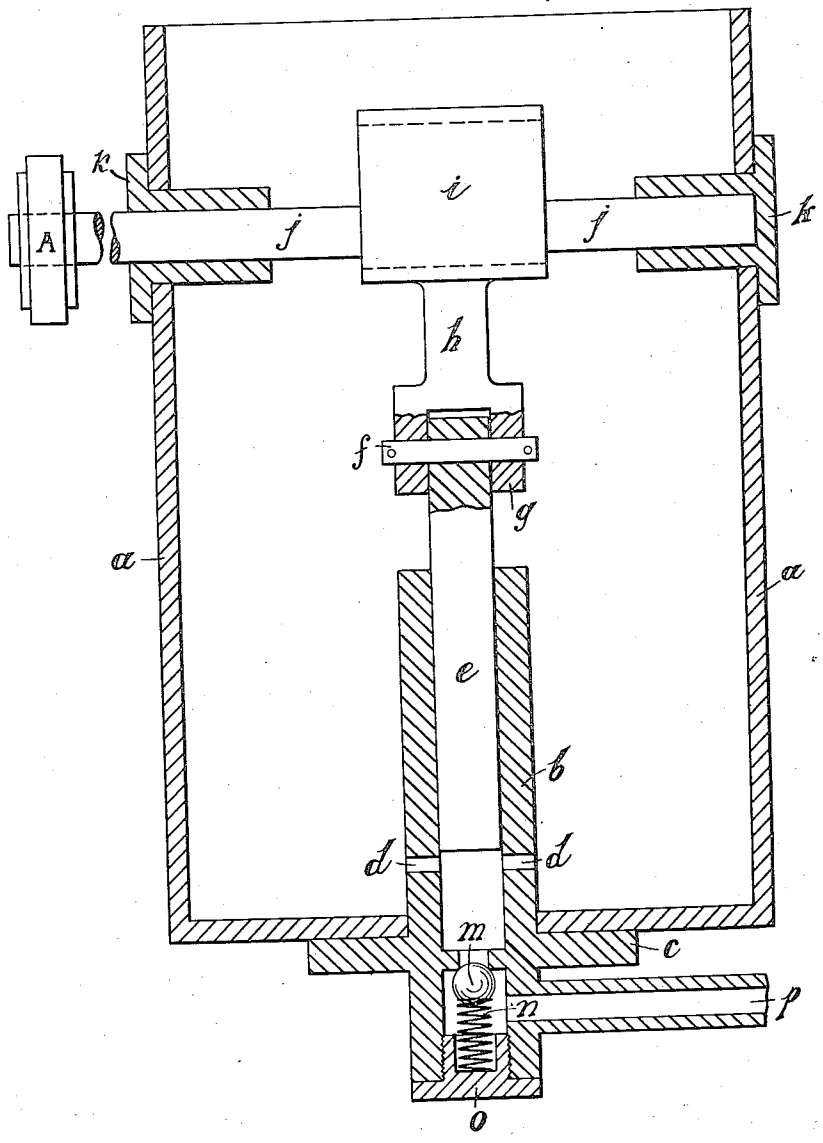
June 24, 1924. 1,499,007

M. EDWARDS

PUMPING MECHANISM FOR HYDRAULIC TIPPING GEAR FOR VEHICLES

Filed May 24, 1921 2 Sheets-Sheet 1

Fig. 1.



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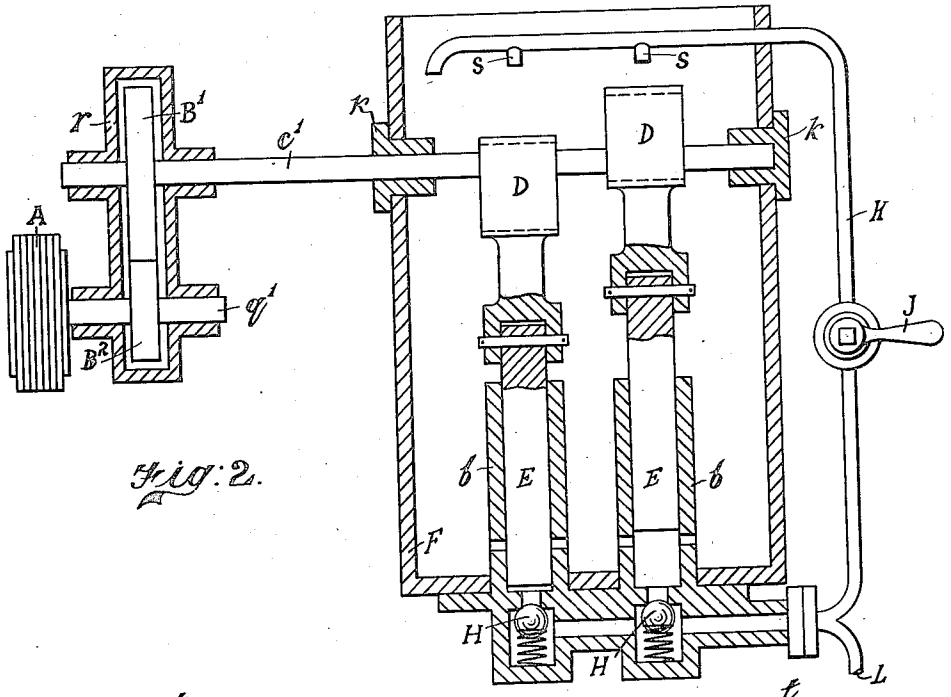


Fig: 2.

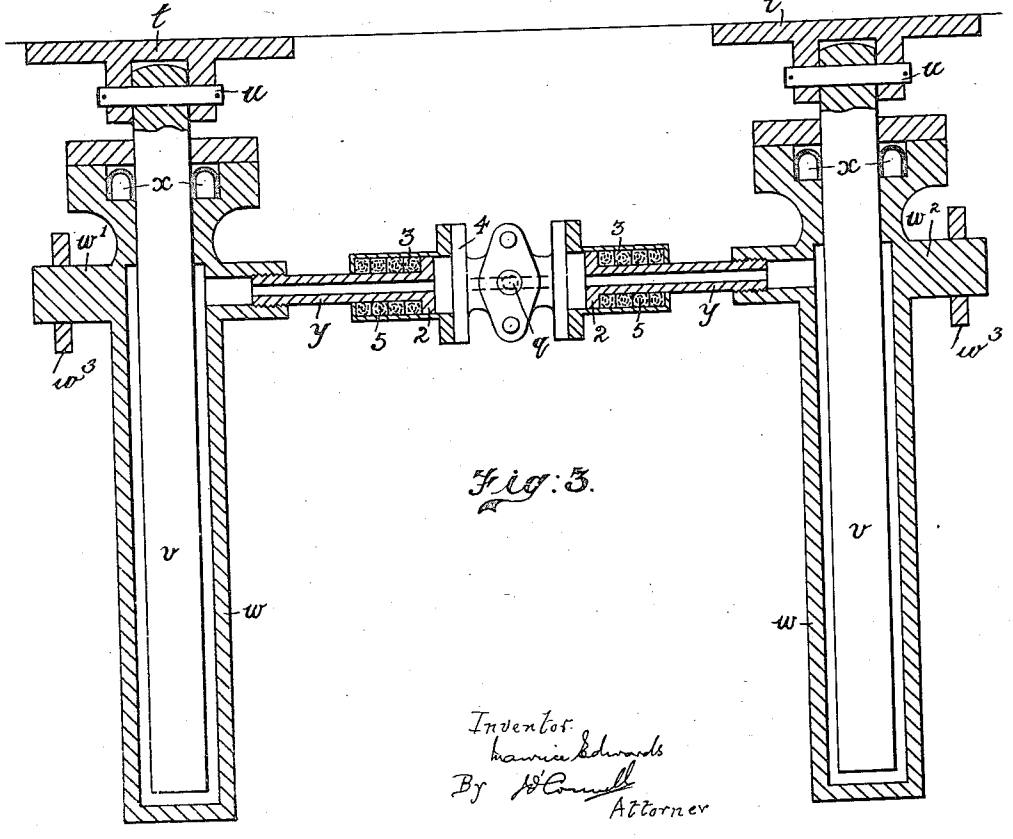


Fig: 3.

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UNITED STATES PATENT OFFICE.

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PUMPING MECHANISM FOR HYDRAULIC TIPPING GEAR FOR VEHICLES.

Application filed May 24, 1921. Serial No. 472,301.

To all whom it may concern:

Be it known that I, MAURICE EDWARDS, subject of the King of Great Britain and Ireland, and resident of Bolton, in the county of Lancaster, England, have invented certain Improvements in Pumping Mechanism for Hydraulic Tipping Gear for Vehicles, of which the following is a specification.

This invention relates to improvements in tipping gear of the hydraulic type of motor road vehicles fitted with bodies adapted to be lifted up about their pivotal points from a horizontal to an inclined position for the purpose of discharging the load and for lowering the body back again to the horizontal position, the object in the first place being to provide a self contained pump and enclosing chamber, means for driving the pump from the motor mechanism, means for returning the liquid to be pumped back again to the enclosing chamber to enable it to be used over again, means for lubricating the eccentrics operating the pump plungers, and an improvement on that already proposed type of apparatus wherein fixed pipes feed the liquid used to the lifting jack cylinders, the latter oscillating about fixed points into which the pipes enter to accommodate itself and its plunger to the varying angle of the tipped body as the body to which the plunger is attached is raised around its pivots.

My invention will be fully described with reference to the accompanying drawings in which—

Fig. 1, is a sectional elevation of a single plunger pump and its enclosing casing,

Fig. 2, similar view of a double pump arrangement and means for returning the liquid back to the enclosing chamber and for lubricating the eccentric mechanism, and

Fig. 3, sectional elevation of the tipping or lifting jack arrangement in connection with the body and chassis of the vehicle.

With the aforesaid objects in view and referring to the aforesaid drawings *a* indicates a chamber for containing the liquid to be pumped in operating the tipping mechanism, the liquid employed being usually oil, which is run into the chamber to about half its depth. At the lower end of the chamber I fix a pump barrel *b* which may be secured to it by a flange *c* bolted or otherwise secured to the chamber so that it may be readily removed when required. Near the lower end of the pump barrel is formed one or more ports *d* through which oil can pass from the chamber into the pump barrel. Working within the latter is a plunger *e* secured by a pin *f* to a forked arm *g* forming part of an eccentric strap *h* embracing an eccentric *i* fixed upon a shaft *j* mounted in bearings *k* secured to the chamber *a*, the shaft passing forward at one end in the direction of the fly wheel of the engine of the motor vehicle. This latter end of the shaft is fitted with a friction disc A which is merely shown diagrammatically and which may be brought into or removed from, contact with the fly wheel of the vehicle engine or a part attached to or driven by the said fly wheel in any convenient or known manner. In an extension of the pump barrel *b* is located a valve *m* normally pressed towards its seat by a spring *n* the valve and spring being easily removable by unscrewing the cap *o*. A pipe *p* is connected to the chamber of the valve *m* and delivers the oil to the cylinders or barrels of the hydraulic jacks used for tipping the body of the vehicle.

The action of the device shown in Fig. 1, is that on the upward stroke of the plunger *e* a slight vacuum is created in the cylinder *b* so as to cause the oil to flow from the surrounding chamber *a* into the pump barrel the valve being meanwhile close against its seat. On the descent of the plunger below the inlet ports *d* the oil in the bottom of the barrel is forced past the valve *m* and through the pipe *p* to a T-shaped pipe fitting or connecting piece, shown in Fig. 3, and hereinafter described.

In Fig. 2, I have shown an arrangement of duplex pumps arranged in the oil chamber F, *b* being the pump barrels, E the plungers, D the eccentric straps, and H the spring controlled valves. C^1 is the main shaft which in this case is fitted with a spur wheel B^1 gearing into a pinion B^2 mounted upon a short shaft q^1 which carries the friction disc A. The two shafts c^1 and q^1 are supported in a housing *r* which can be turned about the shaft c^1 to put the friction disc A in contact with the engine fly wheel or to remove it therefrom. Oil passes by way of pipe L to the connecting piece *q* shown in Fig. 3.

Both in connection with the arrangement of pump shown in Fig. 1, as well as the duplex pump arrangement shown in Fig. 2, I provide means for returning the oil back to

the chamber *a* or F from the cylinders or barrels of the jacks shown in Fig. 3, such arrangement comprising a pipe K in connection with pipe *p* or pipe L. Pipe K extends into the chamber *a* or F so as to discharge the oil. During the return of the latter some of it passes by way of open branches *s* on to the eccentrics for driving the pumps so lubricating them. J is a valve for controlling the pipe K.

In Fig. 3, I have shown an improved arrangement of hydraulic jack connected with the tipping body and chassis of the vehicle. The arrangement consists of brackets *t* secured to the tipping body, such brackets having pivoted to them by means of pins *u* plungers *v* passing into barrels *w* provided with the usual packing rings *x* between themselves and the plungers. Each of the jack barrels *w* is provided with an extension pipe *y* on its inner side firmly fixed to it at its outer end, such pipe in each case having a flanged head 2 within an enclosing chamber or stuffing box 3 fixed to one of the flanges 4 of the connecting piece being a fixture on the chassis of the vehicle. 5 indicates the packing within the stuffing boxes 3. The arrangement is such that as the tipping body is raised and lowered the plungers *v* and barrels *w* shown in Fig. 3 can move respectively about the pins *u*, extension pipes *y* and trunnions w^1 w^2 to accommodate themselves to the angular position of the vehicle body.

The trunnions w^1 w^2 of each barrel *w* may rotate within any suitable bearings w^3 supported by or from the chassis of the vehicle or from a wheel axle.

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

1. In actuating means for tipping mechanism of motor road vehicles the combination of a liquid-containing chamber open at the top, a pump barrel secured to the base of the chamber and projecting upwardly through said base, into the liquid within the chamber, holes near the base of the pump barrel communicating with the liquid chamber, a piston within the pump barrel, a rotatable shaft mounted in bearings in the liquid chamber, an eccentric on the shaft, an eccentric strap coupling the eccentric to the piston rods, an opening at the base of the pump barrel, a spring-controlled valve located in a chamber for controlling said opening and a pipe connected to said chamber and communicating with a lifting jack.

2. In actuating means for tipping mechanism of motor road vehicles the combination of a liquid-containing chamber open at the top, pump barrels secured to the base of the chamber and projecting upwardly through said base into the liquid within the chamber, holes near the base of the pump barrels communicating with the liquid chamber, pistons within the pump barrels, a rotatable shaft mounted in bearings in the liquid chamber, eccentrics on the shaft, eccentric straps coupling the eccentrics to the piston rods, openings at the base of the pump barrels, spring-controlled valves located in chambers for controlling said openings and a pipe connected to said chambers and communicating with a lifting jack.

3. In actuating means for tipping mechanism of motor road vehicles the combination of a liquid-containing chamber open at the top, a pump barrel secured to the base of the chamber and projecting upwardly through said base into the liquid within the chamber, holes near the base of the pump barrel communicating with the liquid chamber, a piston within the pump barrel, a rotatable shaft mounted in bearings in the liquid chamber, an eccentric on the shaft; an eccentric strap coupling the eccentric to the piston rod, an opening at the base of the pump barrel, a spring-controlled valve located in a chamber for controlling said opening a pipe connected to said chamber and communicating with a lifting jack, plungers pivoted to the tipping body, barrels into which the plungers project having trunnions mounted in bearings in the frame of the vehicle, pipes communicating with the barrels, a stationary connecting piece secured to the said pipe, and stuffing-boxes which couple the said connecting piece to the said pipes communicating with the barrels.

4. In actuating means for tipping mechanism of motor road vehicles the combination of a liquid-containing chamber open at the top, pump barrels secured to the base of the chamber and projecting upwardly through said base into the liquid within the chamber, holes near the base of the pump barrels communicating with the liquid chamber, pistons within the pump barrels, a rotatable shaft mounted in bearing in the liquid chamber, eccentrics on the shaft, eccentric straps coupling the eccentrics to the piston rods, openings at the base of the pump barrels, spring-controlled valves located in chambers for controlling said openings, a pipe connected to said chambers and communicating with a lifting jack, plungers pivoted to the tipping body, barrels into which the plungers project having trunnions mounted in bearings in the frame of the vehicle, pipes communicating with the barrels, a stationary connecting piece secured to the said pipe, and stuffing-boxes which couple the said connecting piece to the said pipes communicating with the barrels.

5. In actuating means for tipping mechanism of motor road vehicles as claimed in claim 2, the combination with the liquid-containing chamber referred to in said claim and with the pipe communicating between

the hydraulic jacks and the said chamber, of a branch pipe coupled to the aforesaid pipe and having an outlet into the upper end of the liquid chamber and a valve on said pipe.

6. In actuating means for tipping mechanism of motor road vehicles, the combination with the eccentric-actuating shaft referred to in claim 2, of means for rotating said shaft from the fly wheel of the vehicle motor, comprising a friction disc mounted on a shaft, a pinion on said shaft gearing with a wheel on the eccentric shaft and an arm freely mounted on the eccentric shaft and carrying the pinion shaft.

In testimony whereof I have hereunto set my hand.

MAURICE EDWARDS.