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SELECTIVE GEAR FOR PORTABLE CRANES

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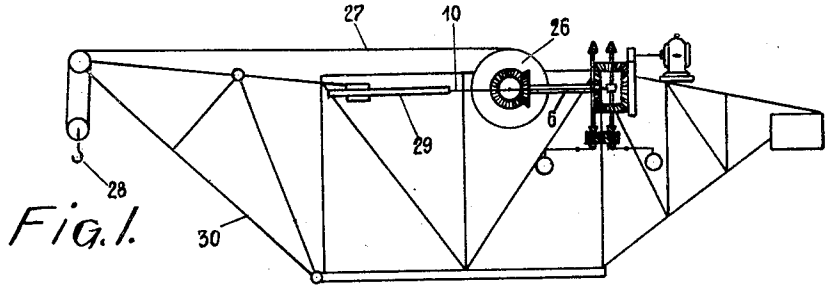

Fig. 1.

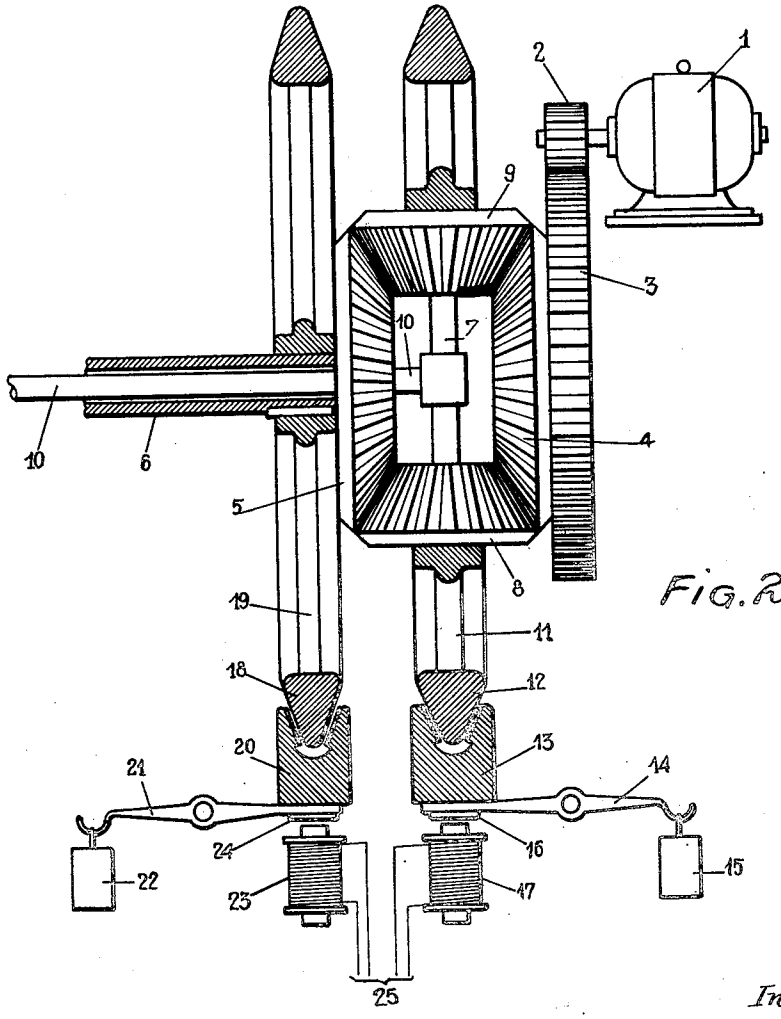

Fig. 2.

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SELECTIVE GEAR FOR PORTABLE CRANES

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Original application March 24, 1932, Serial No. 601,013. Divided and this application February 11, 1933, Serial No. 656,353. In Italy March 27, 1931

2 Claims. (Cl. 212—8)

This application is a division of the application filed by me on March 24th, 1932, and bearing Serial Number 601,013.

The invention relates generally to portable cranes, such as are used for emergency jobs, as for rescuing trains, motor cars, boats and the like, or for building roads, railways and other buildings for which it is not convenient to assemble a stationary crane, whilst one must hoist very heavy loads, as posts of telephonic or electric lines, feeders etc., and more particularly it relates to an improved selective gear, adapted to drive alternately two different parts of the crane from a single motor.

Selective gears for cranes are known embodying shifting gears or other types of gearings. The known selective gears are separated from the speed-reducing gears and from the clutches and brakes, so that it results in a very bulky and heavy mechanism, which is not very suitable for portable cranes, since the weight of a portable crane cannot rise above a given figure, and thus also the loading capacity of the crane is limited by its own weight per pound of load.

The object of the invention is a selective gear having a very low weight and small overall dimensions, so that it may be easily carried by the vehicle on which the crane is fitted. It is adapted to effect two different operations from one and the same motor, and embodies also the reduction gearing between said motor and the drive.

In carrying out the invention, a selective gear suitably comprises a complex gearing (e. g. an epicyclic gearing, or the like) connected with one element to the motor, with another element to an operated part and with a third element to another operated part, and brakes adapted to lock alternately the one or the other element of the said gearing, so that by braking or locking one of said elements, only the other and that part of crane connected thereto is driven by the motor. The complex gearing may suitably consist of a common bevel-wheel differential mechanism, which is connected with a sun to the engine, with another sun to an operated part and with the carrier to the other operated part. Thus the same toothed wheels forming the selective gear serve also as speed-reducing gear, so that in most cases it is sufficient to provide still a simple wheel-and-pinion gear after the engine.

The appended drawing illustrates diagrammatically a selective gear according to the invention used for luffing the jib and hoisting the load of a crane with one and the same motor, and there are:

Fig. 1 a lateral view of the crane, showing the position occupied by the selective gear,

Fig. 2 is a sectional view of an embodiment of the selective gear according to the invention.

According to the figures, a luffing and hoisting motor 1 drives through a reduction gearing 2, 3 a toothed bevel wheel 4. A coaxial bevel wheel 5 fixed on a hollow spindle 6 is faced thereto and planet wheels 8, 9 meshing therewith are loose on a carrier 7 fixed on a shaft 10 passing through the hollow shaft 6. The latter may, as an example, be connected to a drum 26 for the hoisting rope 27, whilst the shaft 10 may drive directly or indirectly a screw 29 for luffing the jib 30.

The carrier 7 is fixed to a braking crown 12 through spokes 11 and a block 13 carried by a beam 14 is maintained normally pressed against the crown 12 by a weight 15 or a spring. The beam 14 carries also an anchor 16 of an electromagnet 17 which, when energized, is able to withdraw the block 13 from the crown 12. The wheel 5 or the shaft 6 carry another crown 18 fixed thereto e. g. by means of spokes 19; a block 20 carried by a beam 21 is pressed against the crown by means of a weight 22 or by a spring, whilst an electromagnet 23 attracts, when energized, an anchor 24 carried by said beam and withdraws the block 20 from the crown 18.

The electric conductors 25 energizing the magnets 17, 23 enter at the other end, as well as the other electric conductors of the crane, in a differential controller, not shown (see reference 19 on Figs. 1, 2 of the co-pending application Ser. No. 601,013), and are interlocked such, that blocks 13, 20 will not be withdrawn from the respective crowns 12, 18, if the motor 1 has not first been switched in, thus avoiding shafts 6, 10 being trailed backwards by their driven parts.

The selective gear described and illustrated is intended to be indicated merely as an example and many modifications thereof are possible within the invention, in accordance with the appended claims. Thus the motor for luffing and hoisting may be of any kind, and it may be substituted by a however operated shaft; the differential selector could also be any epicyclic or hypocyclic gear or any other one, incorporating clutch and reduction gearing; the braking means of any parts of said gearing could also be of any kind and connected in any way; of course both driven shafts could be inverted or applied for driving any other parts of the crane operating alternately.

I am aware that prior to my invention portable cranes have been made with a single motor driv-

ing alternately many movable parts through reduction gears, selective gears and clutch mechanisms, therefore I do not claim such a combination broadly, but I claim:

1. In a jib crane having a hoisting drum and a luffing screw, a motor, a bevel wheel, a reduction gear operatively connecting said motor and said bevel wheel, another bevel wheel, operatively connected to said drum, a carrier, operatively connected to said screw, a plurality of bevel pinions, loose on said carrier and meshing with said bevel wheels, a braking crown connected with said second mentioned bevel wheel, another braking crown connected with said carrier, a pair of beams, a pair of blocks carried by said beams, and a pair of falling weights carried by said beams and adapted to press each of said blocks against one of said crowns.

2. In a jib crane having two driving parts and a motor for alternately driving the said parts, a bevel wheel operatively connected with said motor, another bevel wheel operatively connected with one of said driven parts, a carrier operatively connected with another of said driven parts, a plurality of bevel pinions, loose on said carrier and meshing with said bevel wheels, means adapted to brake said second mentioned bevel wheel, and means adapted to brake said carrier.

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