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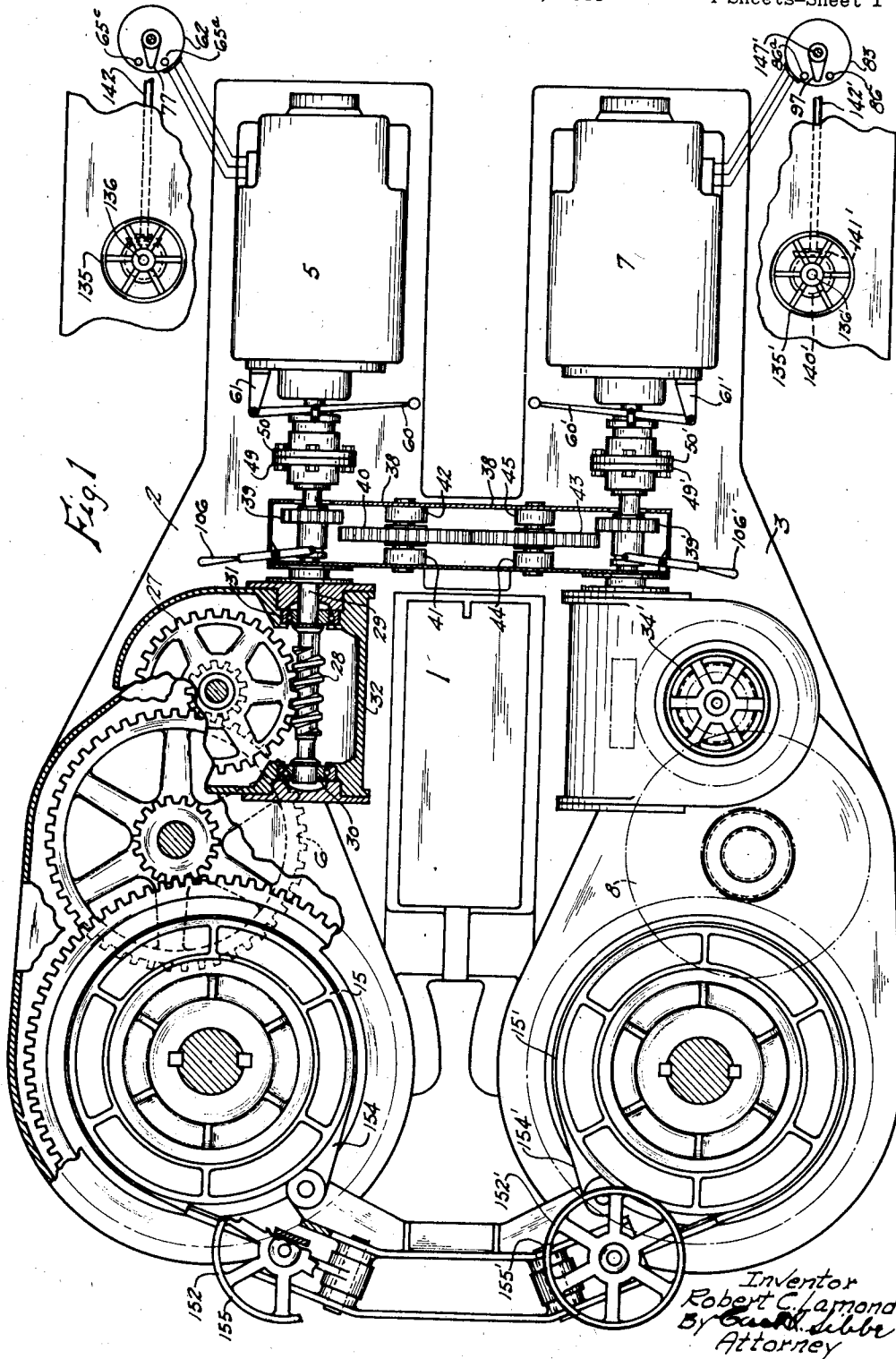
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2,280,652

WINCH

Filed June 29, 1939

4 Sheets-Sheet 1



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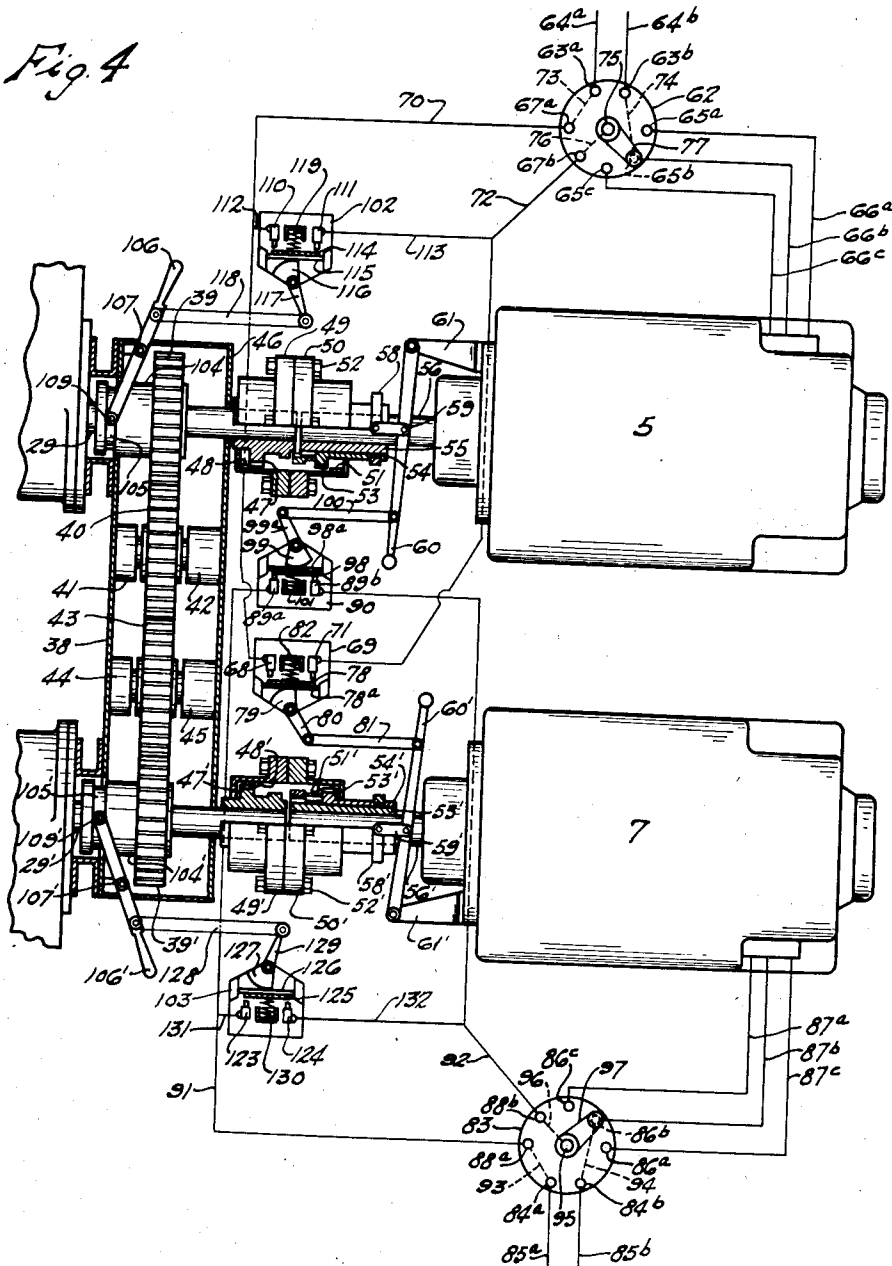
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Fig 4



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WINCH

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9 Claims. (Cl. 172-239)

This invention relates to winches, and more particularly to winches of the power-driven type. On board ship the winches employed, for example, to handle the anchor are usually arranged in pairs so that in the event one winch, for some reason, should become disabled the other may be brought into operation.

One object of the present invention is to provide a pair of winches, each having a motor for operating the same, and means for interconnecting the winches so that either of them may be operated by either of said motors.

A further object is to provide a novel control mechanism which prevents operation of each of said winches by both of said motors at the same time.

Other and further objects will become apparent as the description of the invention progresses.

Of the drawings:

Fig. 1 is a plan view partly in section of the assembled construction comprising the present invention, parts of which being removed to more clearly illustrate certain of the elements thereof.

Fig. 2 is a side elevational view partly in section, showing one of the winches and the operating mechanism therefor.

Fig. 3 is a plan view, diagrammatic in part, of the motors for operating the winches, the gearing which enables operation of either of the winches, and the electric control mechanism associated with the motors.

Fig. 4 is a similar view showing another position of the electric control elements, and of the gearing connecting the two units, and

Fig. 5 is a sectional view of the clutch mechanism and a portion of the gearing associated with one of the winches.

Referring to the drawings, the numeral 1 designates the entire construction consisting in the present instance of a pair of winch units 2 and 3. Unit 2 comprises a wildcat head 4 driven by an electric motor 5 through reduction gearing indicated generally at 6. Unit 3 is similar in construction, and also consists of a wildcat driven by a motor 7 through reduction gearing indicated at 8. Units 2 and 3 are identical in construction and operation, and accordingly a detailed description of one will suffice for both.

Referring more particularly to Figs. 1 and 2, it will be observed that wildcat 4 is secured in any suitable manner to the upper end of a vertical shaft 9. In the present construction shaft 9 extends through a suitable bearing 10 secured in any suitable manner to an upper deck 11. The lower end of shaft 9 is mounted in any suitable

bearing 12 secured to a lower deck 13. Mounted on the lower end of shaft 9 directly above bearing 12 is a large gear 14 which is secured in any suitable manner, to a brake drum 15, secured in any suitable manner to shaft 9, such as by keys 16. Gear 14 meshes with a smaller gear 17 secured intermediate the ends of a shaft 18. Shaft 18 is suitably journaled in bearings 19 and 20, and has secured to the reduced portion 21 thereof a relatively large gear 22, which meshes with a small pinion 23 secured to the lower end of a shaft 24. Shaft 24 is suitably journaled at the lower end thereof in a bearing 25, and extends upwardly through a sleeve 26 to which is secured a worm wheel 27 which meshes with a worm gear 28 mounted on a shaft 29 journaled in bearings 30 and 31 provided in the end walls of casing bracket 32. The upper end of shaft 24 has keyed thereto a clutch element 33 forming one element of a clutch mechanism 34, the other element 26^a of which being provided at the upper end of sleeve 26. Clutch element 33 has secured to the upper end thereof a plate 35 to which the lower end of a screw shaft 36 is secured.

Screw shaft 36 makes threaded engagement with the central bore of a hand wheel 37. To disengage clutch elements 33 and 26^a, hand wheel 37 is operated, which causes a vertical movement of clutch element 33. When this occurs the driving connection between worm gear 28 and pinion 23 is broken. A similar clutch mechanism indicated generally at 34' is provided for unit 3.

Shaft 29 extends through a gear casing 38 and has slidably mounted thereon a gear 39 adapted to engage a gear 40 mounted in bearings 41 and 42 provided within the casing 38. Gear 40 is constantly in mesh with a second gear 43 mounted in bearings 44 and 45, also provided within the casing 38. Gear 43 is adapted to mesh with a gear 39', similar in construction to gear 39 mounted on a shaft 29' associated with unit 3. The outer end of shaft 29 extends through the wall 46 of casing 38, and has secured thereto a gear 47. Gear 47 meshes with the annular gear 48 provided in a coupling member 49, secured to a second coupling member 50, also having an annular gear 51 provided therein. Coupling members 49 and 50 are secured together for simultaneous movement by any suitable means, such as by bolts 52. Annular gear 51 meshes with a pinion 53 integral with a slidable sleeve element 54. Sleeve 54 is keyed, or otherwise slidably secured, to a second sleeve element 55 secured in any suitable manner to the shaft

56 of motor 5. When the parts are in the position shown in Fig. 3, it is seen that upon rotation of motor 5 rotary movement is imparted to gear 53 which in turn imparts a rotary movement to couplings 50, 49, which in turn drives shaft 29 through annular gear 49 and gear 47, thereby causing rotation of gear 39. However, when the parts are in the position shown in Fig. 4, whereby gear 53 is disengaged from annular gear 51, the rotary movement of motor shaft 56 cannot be imparted to coupling elements 49 and 50, and consequently shaft 29 remains stationary. Sleeve 54 has loosely mounted in an annular recess provided near one end thereof a ring 52 to which one end of a link 59 is pivotally attached. The other end of said link is pivotally attached intermediate the ends of a shifting lever 60 pivoted at the upper end thereof to a bracket 61 secured to and extending outwardly from the casing of motor 5. Thus gears 51 and 53 may be engaged or disengaged by simply swinging lever 60 about its pivot.

The parts disposed between shaft 29' and motor 7 are similar in construction to those just described. In this construction also the motor shaft 56' is in axial alignment with shaft 29', the shaft 29' being actuated by coupling members 49' and 50'. The outer end of shaft 29' has secured thereto a gear 47' which meshes with the internal gear 43' secured to coupling member 49'. Coupling members 49' and 50' are secured together in any suitable manner, such as by bolts 52'. Coupling member 50' has provided therein an internal gear 51' which meshes with a gear 53', secured to a slidable sleeve 54', slidably mounted upon a second sleeve 55', secured in any suitable manner to the motor shaft 56'. Sleeve 54' has loosely mounted near one end thereof a ring 52' to which is pivotally secured one end of a link 53'. The other end of link 53' is pivoted intermediate the ends of a shifting lever 60' which in turn is pivoted at the lower end thereof to a bracket 61', secured to and extending outwardly from a motor 7.

From the foregoing description it is seen that should it be desirable to operate wildcat 4 by motor 5, or the wildcat associated with unit 3 by motor 7, the clutch mechanisms 34 and 34' respectively, are engaged, as shown in Figs. 2 and 5. Now, upon operation of both of the motors 5 and 7, it is seen that a direct connection is established between the motor shafts thereof, and the train of gears terminating in the wildcat heads to be driven thereby. Now should it be desired to effect operation of wildcat 4 by motor 7, levers 60 and 60' are actuated to the position shown in Fig. 4. Gears 39 and 39' are also actuated into engagement with gears 40 and 43 respectively, by mechanism which will hereinafter be described in detail. The clutch mechanism 34' associated with unit 3 is disengaged to prevent operation of both units 2 and 3 simultaneously. Upon operation of motor 7 it is now seen that wildcat 4 will be operated through the coupling members 50', 49', gears 39, 43, 40, 39, worm gear 28, and the train of gearing leading therefrom to wildcat 4. It is also seen that to drive the wildcat associated with unit 3 by the motor 5, gears 39 and 39' are actuated to the position shown in Fig. 4. Lever 60, however, is actuated to effect engagement of gears 51 and 53, while lever 60' is actuated to effect disengagement of gears 51' and 53'. Clutch mechanism 34' is now engaged, while clutch mechanism 34 is disengaged to prevent simultaneous operation of both

units. Now upon operation of motor 5 the wildcat associated with unit 3 will be actuated.

The invention further contemplates a novel electrical control mechanism which prevents the operation of either one of the wildcats by both of the motors at the same time. This mechanism will now be described in detail.

As shown more particularly in Figs. 3 and 4, numerals 62 and 63 indicate generally control switches for the motors.

The poles 63^a and 63^b of switch 62 are connected to any suitable source of electric supply by conductors 64^a and 64^b, respectively. Poles 65^a, 65^b and 65^c of switch 62 are connected to electric motor 5 by conductors 66^a, 66^b and 66^c. A sixth pole 67^a of switch 62 is connected to a contact element 68 of a switch 69 by a conductor 70. The other contact element 71 of switch 69 is connected to a seventh pole 67^b of switch 62 by a conductor 72. As shown more particularly in Figs. 3 and 4, poles 63^a and 67^a are connected by a conductor 73, while poles 63^b and 65^b are connected by a conductor 74. Pole 67^b on the other hand is connected to the central pole 75 of switch 62 by a conductor 76. Pole 75 is provided with a contact arm 77 which is adapted to move from the central position shown in Figs. 3 and 4 into engagement with either of poles 65^a or 65^c, as desired. When arm 77 is moved into engagement with pole 65^a motor 5 rotates in one direction, and when moved into engagement with pole 65^c the motor is caused to operate in the reverse direction. When contact arm 77 is in the position shown in Figs. 3 and 4, the circuit to the motor is interrupted; the central pole 65^b being simply a connection for the return lead from the motor, and is always out of engagement with arm 77.

Contact elements 68 and 71 may be engaged by a contact plate 78 mounted on an insulated plate 78^a, adapted to be actuated by a cam 79, the arm 80 of which is connected by a link 81 to the shifting lever 60'. A spring 82 normally maintains contact plate 78 out of engagement with contact elements 68 and 71.

From the foregoing description it is seen that when lever 60' is in the position shown in Fig. 3, contact plate 77 is out of contact with contact elements 68 and 71, and consequently the circuit is interrupted and motor 5 is prevented from starting.

The poles 84^a and 84^b of switch 83 are connected to any suitable source of electric supply by conductors 85^a and 85^b. Poles 86^a, 86^b and 86^c of switch 83 are connected to motor 7 by conductors 87^a, 87^b and 87^c. A sixth pole 88^a of switch 83 is connected to a contact point 89^a of switch 90 by means of a conductor 91, while the other contact point 89^b of switch 83 is connected to the seventh pole 88^b of switch 83 by a conductor 92. Poles 84^a and 88^a of switch 83 are connected by a conductor 93, while poles 84^b and 86^b of said switch are connected by a conductor 94. Pole 86^c is connected to a central pole 95 by a conductor 96. Pole 95 has operatively connected thereto a contact arm 97, which is adapted to move from the central position shown in Figs. 3 and 4 into engagement with either of the poles 86^a or 86^c, as desired. When arm 97 is in engagement with pole 86^a motor 7 is caused to operate in one direction, and when said contact arm is moved into engagement with pole 86^c the said motor is caused to operate in the reverse direction. When contact arm 97 is in the position shown in Figs. 3 and 4 the circuit to the motor

7 is interrupted, the pole 86^b, like pole 65^b of switch 62 simply being a return connection from motor 7, and accordingly is always out of contact with arm 97.

Contact points 89^a and 89^b of switch 90 may be closed by a contact plate 98 secured in any suitable manner to an insulated plate 93^a. Contact plate 98 is adapted to be actuated into engagement with contact points 89^a and 89^b by a cam 99, the arm 99^a of which is pivotally connected by means of a link 100 to the shifting lever 60.

A spring 101 normally urges contact plate 98 out of engagement with contacts points 89^a and 89^b, when the cam 99 is in the position shown in Fig. 3.

From the foregoing description it is seen that when the shifting lever 60 is in the position shown in Fig. 3, plate 98 is out of engagement with contact points 89^a and 89^b, and consequently the circuit to switch 33 is interrupted and motor 7 under such conditions cannot be started up. The control system contemplates a pair of additional switches 102 and 103 for controlling the operation of motors 5 and 7 respectively.

As shown in Figs. 3 and 4, gear 39 has provided thereon an extended hub portion 104 having an annular groove 105 provided therein. A lever 106 pivoted intermediate its ends at 107 to the casing 38 has provided at the lower end thereof a stud 109 which enters into the annular recess 105. Accordingly, to shift gear 39 into or out of engagement with gear 40 lever 106 is simply swung on its pivot 107. Switch 102 is similar in construction to switches 69 and 90, and also comprises a pair of contact elements 110 and 111, the former of which is connected to conductor 70 by a conductor 112, while the latter is connected to conductor 72 by a conductor 113. A contact plate 114 is adapted to engage contact elements 110 and 111, which plate is seated upon an insulated plate 115, which in turn is engaged by a cam member 116. Cam member 116 has secured thereto an arm 117, the lower end of which is pivotally connected to lever 106 by a link 118. A spring 119 is provided to urge contact plate 114 out of engagement with contact elements 110 and 111, when lever 106 is in the position shown in Fig. 4. When the parts are in the position shown in Fig. 3 it is seen that contact plate 114 is in engagement with contact elements 110 and 111, and consequently the circuit to switch 62 is closed, and motor 5 may be started upon movement of arm 77 of switch 62 into engagement with pole 65^a or 65^c. Gear 39, it will be observed, is out of engagement with gear 40, and consequently motor 5 cannot operate the wildcat associated with unit 3, but is conditioned for driving the wildcat 4 associated with the unit 2 of which the motor 5 forms a part.

Gear 39' has also secured thereto an enlarged hub portion 104', having provided therein an annular groove 105'. A lever 106' pivoted intermediate its ends at 107' has provided at one end thereof an anti-friction stud 109' which operates in groove 105', and which is adapted upon operation of lever 106' to shift gear 39' into and out of mesh with gear 43.

Switch 103, like switch 102 just described, is also provided with a pair of contact elements 123 and 124 adapted to be engaged by a contact plate 125 secured to an insulated plate 126, which in turn is engaged by a cam element 127. A link 128 connects lever 106' with the arm 129 of cam element 127. A coil spring 130 actuates

the contact plate 125 out of engagement with contact elements 123 and 124 when cam element 127 is moved to the position of adjustment shown in Fig. 4. Contact elements 123 and 124 are connected to conductors 91 and 92 by conductors 131 and 132, respectively. When the parts are in the position shown in Fig. 3 it will be observed that contact plate 125 is in engagement with contact elements 123 and 124, and consequently the circuit to switch 82 is closed and motor 7 under such conditions may be started up. Gear 39', however, is out of mesh with gear 43, and therefore only the wildcat associated with unit 3 may be operated under these conditions by motor 7.

Referring more particularly to Figs. 1 and 2, the contact arms 77 and 97 of switches 62 and 82, respectively, may be actuated by mechanism which will now be described in detail. Contact arm 77 is operated by a hand wheel 135, secured to the upper end of a shaft 136 extending through a casing 137, secured to the deck 11. The lower end of shaft 136 is journaled in a bearing 138 provided at one side of a bracket 139, secured to and depending from the under side of deck 11. The lowermost end of shaft 136 has secured thereto a bevel gear 140, which meshes with a bevel gear 141, secured to a horizontally disposed shaft 142 mounted in bearings 143 and 144. The other end of shaft 142 has secured thereto a bevel gear 145, which meshes with a bevel gear 146 secured to the upper end of shaft 147 journaled at the upper end in a bearing 148. The lower end of shaft 147 extends through the standard 149 of switch 62, and to which is secured contact arm 77, which, as pointed out hereinbefore, is adapted for movement from the central position shown in Figs. 1, 3 and 4, into engagement with pole 65^a or 65^c.

The contact arm 97 of switch 82 is adapted for movement into engagement with contact elements 86^a or 86^c, as previously described, by manipulation of a hand wheel 135'. Hand wheel 135' is secured to the upper end of a shaft 136', to which is also secured a bevel gear 140', which meshes with a bevel gear 141' secured to a horizontally disposed shaft 142'. Shaft 142' is operatively connected by a bevel gear mechanism similar to that shown in Fig. 2, to the vertical shaft 147' to which the contact arm 97 of switch 82 is secured. It therefore is apparent that by manipulation of hand wheel 135' contact arm 97 may be actuated into engagement with contact points 86^a or 86^c to effect the desired operation of electric motor 7.

The usual hand braking mechanism indicated generally at 152 and 152' are provided for units 2 and 3 respectively. Braking mechanism 152 comprises the usual brake drum 15, and brake band 154, which may be tightened or loosened by manipulation of hand wheel 155 through any suitable interconnecting mechanism 156. Braking mechanism 152' is similar in construction, and also comprises a brake drum 15' having associated therewith the usual brake band 154' which may be manipulated by a hand wheel 155'.

From the foregoing description it is seen that the wildcats associated with units 2 or 3 may be operated through the train of gearing just described, by electric motors 5 or 7. By the provision of the electric interlocking mechanism just described, it is seen that the wildcats associated with either of the units 2 or 3 cannot be operated by both motors 5 and 7 at the same time. When the parts are in the position shown in Fig. 3 the wildcats associated with unit 2 may be operated

only by motor 5, while the wildcat associated with unit 3 may be operated only by motor 7. When the parts are in the position shown in Fig. 4, gears 51' and 53' associated with the coupling element 50' are engaged, while the gear elements 51 and 53 associated with coupling element 50 are disengaged. Consequently no motion from motor 5 is transmitted to shaft 29. Levers 106 and 106' have been so shifted as to engage gears 39 and 40, and 39' and 43. Consequently the wildcat associated with unit 2 may now be operated by motor 7 through shafts 56', 29', gears 39', 43, 40, 39, shaft 29, and the train of gearing between shaft 29 and wildcat head 4.

When the parts are in the position shown in Fig. 4, it will also be noted that switches 102 and 69 are opened, thereby interrupting the circuit to motor 5, and consequently said motor cannot be started. On the other hand switch 90, one of the switches which controls the circuit to motor 7 is closed and consequently motor 7 may be started. Switch 103, the other switch which controls the starting operation of motor 7 is also opened when the parts are in the position shown in Fig. 4, but this is of no consequence inasmuch as the companion switch 93, which also controls the operation of motor 7, is closed. If lever 60 were actuated so as to cause engagement of gears 51 and 53, while the other parts shown in Fig. 4 remained in the same position of adjustment as therein shown, it is seen that switch 90 would be opened by movement of contact plate 93 out of engagement with contact elements 93^a and 93^b by spring 101. This would interrupt the circuit to motor 7 and consequently neither of the motors could then be started.

If it should be desired to operate the wildcat associated with unit 3 by motor 5, lever 60 would be shifted so as to cause the engagement of gears 51 and 53, while lever 60' would be actuated to effect the disengagement of gears 51' and 53'. Levers 106 and 106' would remain in the position shown in Fig. 4. Now it is seen that contact plate 70 associated with switch 69 would be moved into engagement with contact elements 68 and 71, thereby closing the circuit to motor 5 to enable the starting up of said motor. As pointed out before, when lever 60 is moved so as to cause the engagement of gears 51 and 53, spring 101 urges contact plate 93 of switch mechanism 90 out of engagement with contact elements 93^a and 93^b, thereby interrupting the circuit to motor 7.

From the foregoing description it is seen that a simplified, as well as highly useful mechanism has been provided which prevents driving of either of the wildcat units by both motors at the same time, thereby preventing damage to the parts by overloading.

While the embodiment herein shown is admirably adapted to fulfill the objects primarily stated, it is to be understood that the invention is not to be limited thereto, since it may be embodied in other forms, all coming within the scope of the claims which follow.

What is claimed is:

1. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors, a drive shaft for each of said motors, a driven shaft in axial alignment with each of said drive shafts, a driven member operatively connected to one of said driven shafts, a second driven member operatively connected to the other of said driven shafts a coupling member associated with each of said drive and driven shafts for connecting or discon-

necting the same, independent operating means for each of said coupling members, a switch in one of said circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with said second motor for opening and closing said switch, a switch in the other of said circuits for controlling said second motor, means operated by the coupling operating means associated with said first motor for opening or closing said last mentioned switch, gearing disposed between said driven shafts whereby either of said driven members may be operated by either of said motors, means for preventing operation of either of said driven members by both of said motors, said last mentioned means comprising a pair of switches, one of said last mentioned switches being provided in each of said circuits, a gear shifting means adjacent each of said driven shafts for connecting its associated driven shaft with, or disconnecting it from said gearing, means operated by one of said gear shifting means for actuating one of said pair of switches to open position when its associated driven shaft is connected to said gearing and for actuating said switch to closed position when said driven shaft is disconnected from said gearing, and means actuated by the other of said gear shifting means for actuating the other of said pair of switches to open position when its associated driven shaft is connected to said gearing and for actuating said last mentioned switch to closed position when said last mentioned driven shaft is disconnected from said gearing.

2. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors, a drive shaft for each of said motors, a driven shaft in axial alignment with each of said drive shafts, a driven member operatively connected to one of said driven shafts, a second driven member operatively connected to the other of said driven shafts a coupling member associated with each of said drive and driven shafts for connecting or disconnecting the same, independent operating means for each of said coupling members, a switch in one of said circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with said second motor for opening and closing said switch, a switch in the other of said circuits for controlling said second motor, means operated by the coupling operating means associated with said first motor for opening or closing said last mentioned switch, gearing disposed between said driven shafts whereby either of said driven members may be operated by either of said motors, means for preventing operation of either of said driven members by both of said motors, said last mentioned means comprising a pair of switches, one of said last mentioned switches being provided in each of said circuits, a gear shifting means adjacent each of said driven shafts for connecting its associated driven shaft with, or disconnecting it from said gearing, means operated by one of said gear shifting means for actuating one of said pair of switches to open position when its associated driven shaft is connected to said gearing and for actuating said switch to closed position when said driven shaft is disconnected from said gearing, means actuated by the other of said gear shifting means for actuating the other of said pair of switches to open position when its associated driven shaft is connected to said gearing and for actuating said last men-

tioned switch to closed position when said last mentioned driven shaft is disconnected from said gearing, and reversing switches provided in said circuits for controlling the direction of rotation of said motors.

3. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts for connecting or disconnecting the same, a switch in one of said circuits for controlling the operation of one of said motors, and means operated by the coupling operating means associated with the other of said motors for opening or closing said switch.

4. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts for connecting or disconnecting the same, a switch in one of said circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with the other of said motors for opening or closing said switch, means operated by the coupling operating means associated with the second motor for opening and closing said switch, a switch in the other of said circuits for controlling said second motor, and means operated by the coupling operating means associated with said first motor for opening or closing said last mentioned switch.

5. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts, operating means for each of said coupling members for connecting or disconnecting the said drive and driven shafts associated therewith, a switch in one of the circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with the other of said motors for opening or closing said switch, mechanism providing a driving connection between said driven shafts whereby both of said driven shafts may be operated by either of said motors, means for actuating said mechanism to connect or disconnect the driving connection between said driven shafts, and means actuated by said last mentioned means for preventing operation of either of said driven shafts by both of said motors at the same time.

6. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts, operating means for each of said coupling members for connecting or disconnecting the said drive and driven shafts associated therewith, a switch in one of the circuits for controlling the operation of one of said motors, means operated

by the coupling operating means associated with the other of said motors for opening or closing said switch, gearing disposed between said driven shafts enabling simultaneous operation thereof whereby both of said driven shafts may be actuated by either of said motors, means for shifting said gearing to connect and disconnect the driving connection between said driven shafts, and means actuated by said last mentioned means for preventing operation of either of said driven shafts by both of said motors at the same time.

7. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts, operating means for each of said coupling members for connecting or disconnecting the said drive and driven shafts associated therewith, a switch in one of the circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with the other of said motors for opening or closing said switch, a switch in the other of said circuits for controlling said second motor, means operated by the said coupling means associated with said first motor for opening or closing said last mentioned switch, mechanism providing a driving connection between said driven shafts whereby both of said driven shafts may be actuated by either of said motors, means for actuating said mechanism to connect and disconnect the driving connection between the said driven shafts, and means actuated by said last mentioned means for preventing operation of either of said driven shafts by both of said motors at the same time.

8. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts, operating means for each of said coupling members for connecting or disconnecting the said drive and driven shafts associated therewith, a switch in one of the circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with the other of said motors for opening or closing said switch, a switch in the other of said circuits for controlling said second motor, means operated by the said coupling means associated with said first motor for opening or closing said last mentioned switch, gearing disposed between said driven shafts enabling simultaneous operation thereof whereby both of said driven shafts may be actuated by either of said motors, means for shifting said gearing to connect and disconnect the driving connection between said driven shafts, and means actuated by said last mentioned means for preventing operation of either of said driven shafts by both of said motors at the same time.

9. In a device of the class described, the combination of a pair of electric motors, independent electric circuits for said motors whereby said motors may be operated simultaneously or independently of each other, a drive shaft for each

of said motors, a driven shaft adjacent each of said drive shafts, a coupling member associated with each of said drive and driven shafts, operating means for each of said coupling members for connecting or disconnecting the said drive and driven shafts associated therewith, a switch in one of the circuits for controlling the operation of one of said motors, means operated by the coupling operating means associated with the other of said motors for opening or closing said switch, a switch in the other of said circuits for controlling said second motor, means operated by the said coupling means associated

with said first motor for opening or closing said last mentioned switch, gearing disposed between said driven shafts enabling simultaneous operation thereof whereby both of said driven shafts may be actuated by either of said motors, means for shifting said gearing to connect and disconnect the driving connection between said driven shafts, and switch means actuated by said last mentioned means for preventing operation of either of said driven shafts by both of said motors at the same time.

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