

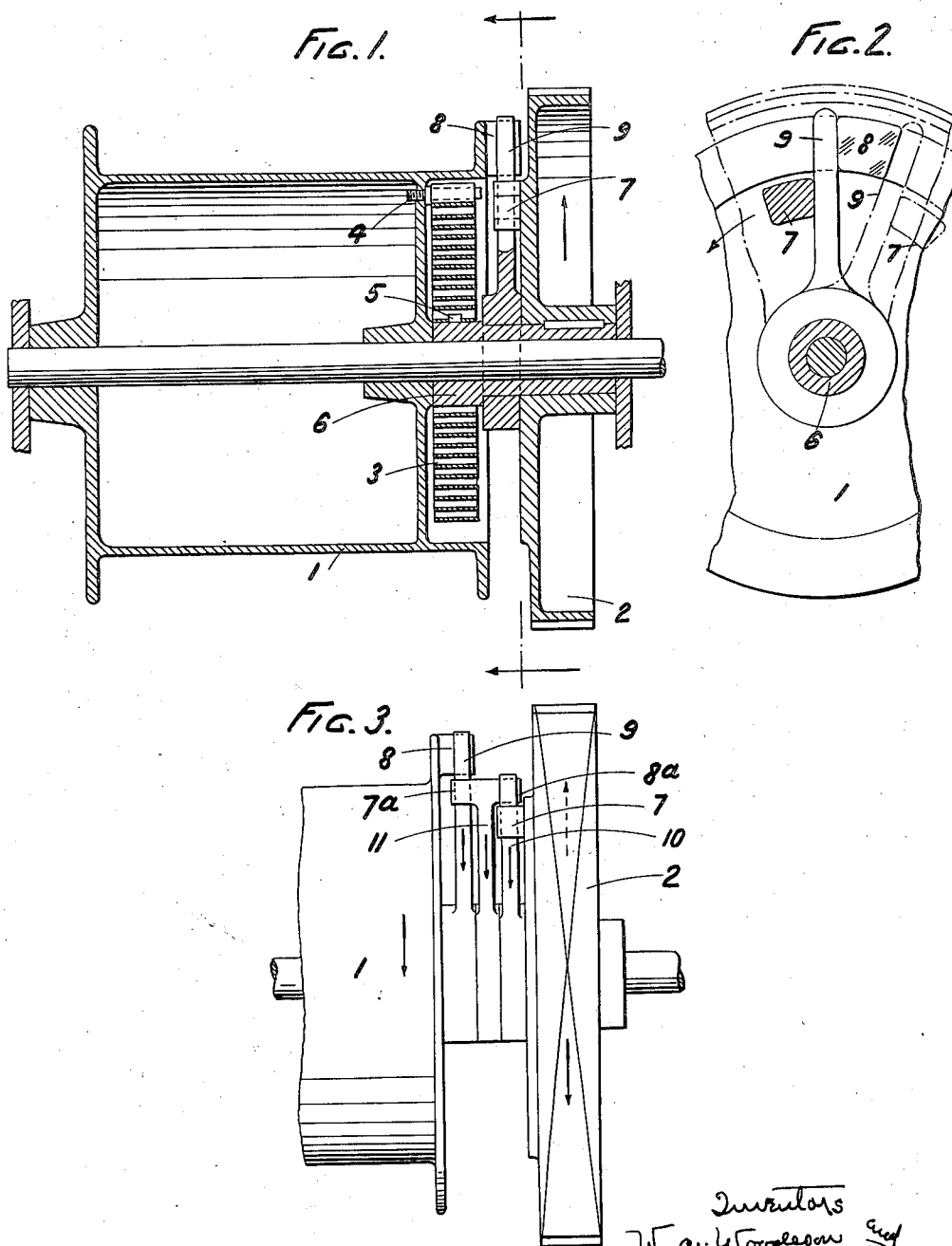
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W. A. WOODSON ET AL

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MEANS FOR DRIVING ROTARY MEMBERS

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Inventors
W. A. Woodson and
Walter Midgley
By *Patterson, Wright & Patterson*
attorneys

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MEANS FOR DRIVING ROTARY MEMBERS

William Armstrong Woodeson and Walter Midgley, Gateshead-on-Tyne, England, assignors to William Armstrong Woodeson, Gateshead-on-Tyne, England

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4 Claims. (Cl. 64—15)

This invention relates to means of the kind wherein one rotatable member is adapted to be driven from another rotatable member at one time first through a spring and thereafter directly, and it has for its object to enable the time at which the direct drive occurs to be longer delayed than has heretofore been possible.

The feature of prolonged delayed direct drive will be found advantageous in many services. For instance the feature will be particularly useful in raising seaplanes by cranes onto the deck of a vessel under way or while in rough water; it will also better allow for variation in traveling speed between the two craft.

To achieve the object in view, the invention consists in arranging parts so that the direct drive between the two desired rotary members is effected through intermediate means which enable a winding of a spring that connects the two rotary members to proceed during more than one revolution of one member in relation to the other.

In the accompanying drawing Fig. 1 is a side or longitudinal sectional elevation and Fig. 2 a part sectional endwise view, corresponding to the line 2—2 of Fig. 1, of a hoisting rope barrel and an associated driving wheel equipped with one form of means according to the invention. Fig. 3 is a side elevation of a modification.

Referring first to the embodiment illustrated in Figs. 1 and 2, where 1 represents the hoisting rope barrel and 2 the associated driving wheel coaxial therewith, a spring 3 of so-called clock or "main-spring" type is coiled inside or adjacently within the end section of the barrel 1, one end thereof being attached to the latter as by a pin 4 and the other end thereof being attached, as by a pin 5, to a sleeve 6 splined to or made otherwise movable with the driving wheel and extending partially into the barrel or its end section with said spring centered thereon. A laterally projecting lug or claw 7 is provided on the driving wheel 2 and a similar lug or claw 8 is provided on the barrel 1, the two being arranged or disposed so that they travel in paths clear of one another, although one is adapted to drive the other through an interposed contacting member. In the example under consideration the paths of the two lugs include a median plane common to both, the lug 7 on the driving wheel having an outside radius slightly less than the inside radius of the lug 8 on the barrel 1 and the drive from the former to the latter is effected through a contacting member in this instance comprising

swinging arm 9 which is mounted so as to have free rotation independently upon the aforementioned sleeve 6 between the driving wheel and barrel.

Starting from a position indicated in full lines at which the arm 9 is between and engaged by both the lugs 7 and 8, it will be appreciated that the driving wheel lug 7, when moved in a direction as indicated by the arrow, can recede from said arm until one revolution has been almost completed, whereupon it will be at the same side as the barrel lug 8. Continued rotation of the driving wheel lug 7 will then cause the arm 9 to recede from the barrel lug 8 until a second revolution has been practically completed, at which time the arm will have engaged the barrel lug and become located between the two lugs 7 and 8 again, in reversed relation, in effective direct driving condition as illustrated in dot-and-dash lines in Fig. 2. Meanwhile, the spring 3 is wound by the relative rotation of the two wheel parts. A resilient drive thus obtains or is provided during the unwinding of nearly two turns of rope on the barrel.

When necessary, the direct drive can be further delayed by employing more than one arrangement or arm of the kind referred to, one adapted to come into use following the other. This is more or less diagrammatically illustrated in Fig. 3, where there are interposed between the driving wheel 2 and arm 9, two other arms 10 and 11, the arm 10 being practically a duplicate of arm 9 and the arm 11 having a lug 7^a on one side equivalent to the driving wheel lug 7 and another lug 8^a on the other side equivalent to the lug 8 upon the barrel 1. The action of this will be self-evident when it is pointed out that practically two revolutions of the arm 11 must follow two almost complete revolutions of the arm 10 before the arm 9 is made to transmit direct drive to the barrel 1.

As will be understood, the invention is not limited in its application to the example outlined; another instance in which it may be very useful is in application to multiple rope grab cranes.

What we claim is:—

1. In a device of the character described, a supporting shaft, a drum and a sleeve freely rotatable on said shaft independent of one another, a drive member for rotating said sleeve, a coiled spring concentrically disposed in respect to said shaft and said sleeve adjacent the drum, one end of said spring being connected to said drum and the other end to said sleeve to pro-

vide a resilient drive connection between the sleeve and the drum, laterally extending claws oppositely carried by said drum and said drive member and disposed to travel in paths clear of one another within a common plane, and a swing arm mounted to rotate freely on said sleeve within said plane in the path of travel of said claws and adapted to be engaged thereby so as to provide a positive drive connection therethrough between the drive member and the drum after the drive member has been rotated with respect to the drum a predetermined extent greater than one full revolution.

2. In a device of the character described, a supporting shaft, a drum and a sleeve rotatable on said shaft independently of one another, a coiled spring concentrically disposed in respect to said shaft and said sleeve and positioned within a chamber formed in one end of said drum, one end of said spring having attachment with the drum and the other end of the spring having attachment with the sleeve, a drive member for rotating said sleeve, said drive member and said drum being provided with claws extending oppositely toward one another but movable in different paths clear of one another within a common plane between said drive member and drum, a ring member freely rotatable on said sleeve and disposed in said plane between the drum and the drive member, said ring member provided with a radially extended arm portion disposed in the path of travel of said claws so as to be engaged on opposite sides thereby, the said spring providing a resilient drive connection between the drive member and the drum and the arm portion of said ring member together with said claws providing a positive drive connection between the drive member and the drum after rotation of the former relative to the latter through more than one revolution, the parts co-acting as and for the purpose described.

3. In a rotary drive mechanism of the class described, a driving member and a driven member mounted side by side co-axially so as to be rotatable independently of each other, the driving member being provided with a hub portion extending axially into one end of the driven member and the driven member being formed with an annular surrounding space of a diameter substantially greater than the diameter of said hub portion, a convolutionally coiled spring mounted axially upon said hub portion within said annular space of the driven member, the said spring having one end secured to said member and the other end secured to said hub portion so as to provide a

resilient drive connection between the driving and driven members, a lateral projection on the driving member toward the driven member and a like projection on the driven member toward the driving member, the two projections being disposed to travel clear of each other in circular paths within a common plane between the two members, and a radially mounted swing arm rotatable independently in said plane between the driving and driven members upon the hub portion of the former so as to be engaged at opposite sides by said projections of each and to establish a direct drive between the said two members after rotation of the driving member with respect to the driven member in one direction through substantially two complete revolutions.

4. In a mechanism of the class described, a rotary driving member and a rotary driven member mounted side by side on a single shaft so as to be rotatable freely independently of each other, the driving member being provided with a hub portion extending axially into one end section of the driven member and the driven member being formed with an annular surrounding space in said end section of a diameter substantially greater than the diameter of said hub portion, a convolutionally coiled spring mounted axially upon said hub portion within said annular space of the driven member, the said spring having its outer end secured to said member and its inner end secured to said hub portion so as to provide a resilient drive connection between the driving and driven members through the effect of winding upon rotation of one with respect to the other, a lateral projection on the driving member toward the driven member and a like projection on the driven member toward the driving member, the two projections being disposed to travel clear of each other in different circular paths within a common plane between the two members, and a swing arm radially mounted to rotate independently in said plane between the driving and driven members upon the hub portion of the former so as to be engaged at opposite sides by the said projections of each and to establish a direct drive connection between the said two members when engaged between the projections of both after rotation of the driving member with relation to the driven member through substantially two revolutions in one direction, the aforesaid spring meanwhile being wound between its connections with the said parts.

WILLIAM ARMSTRONG WOODSON.
WALTER MIDGLEY.