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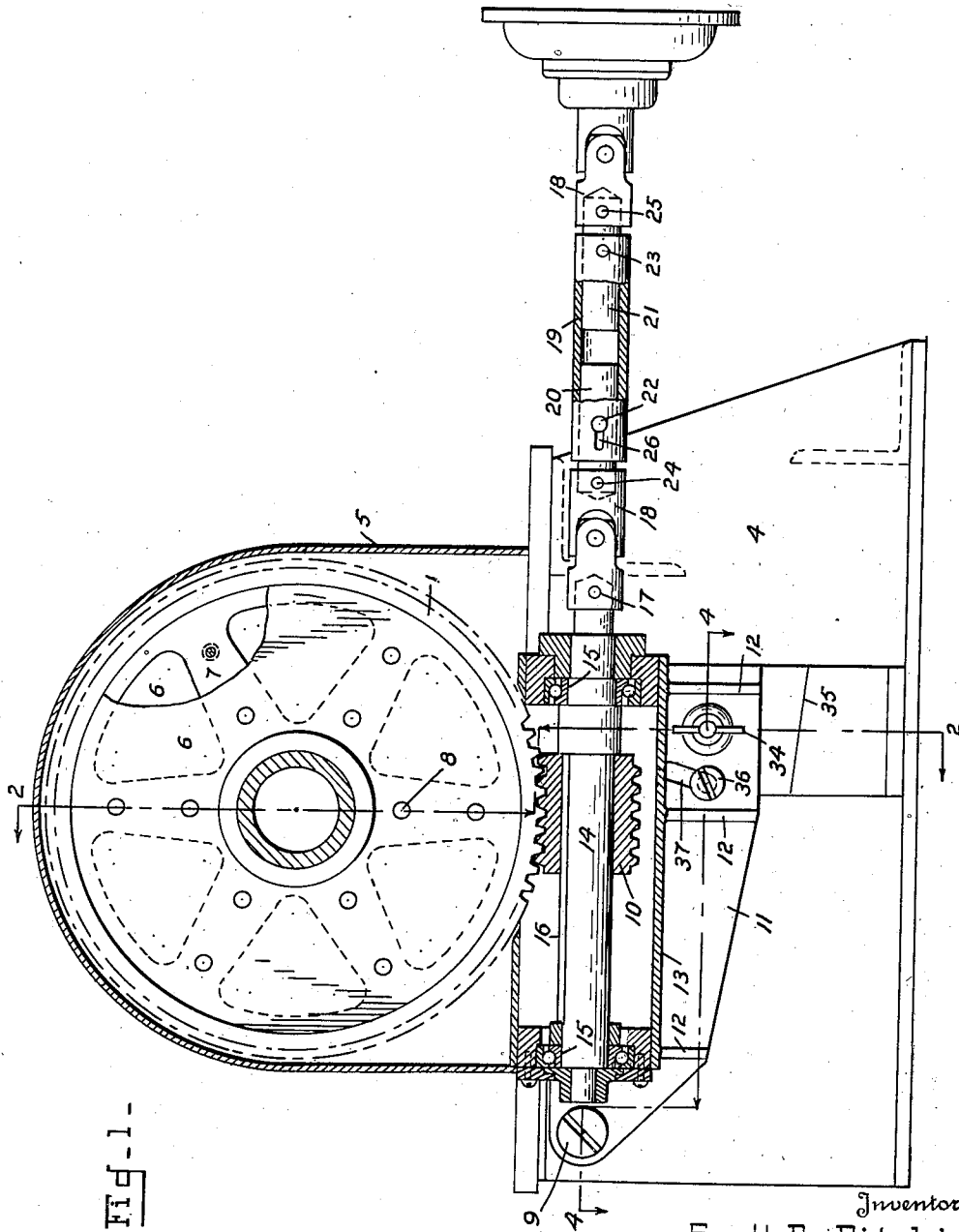
S. B. RITCHIE

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SLOW MOTION DRIVE FOR CENTRIFUGAL CASTING MACHINE

Filed July 23, 1941

2 Sheets-Sheet 1



By *G. J. Kessanich & H. Church*
Attorneys

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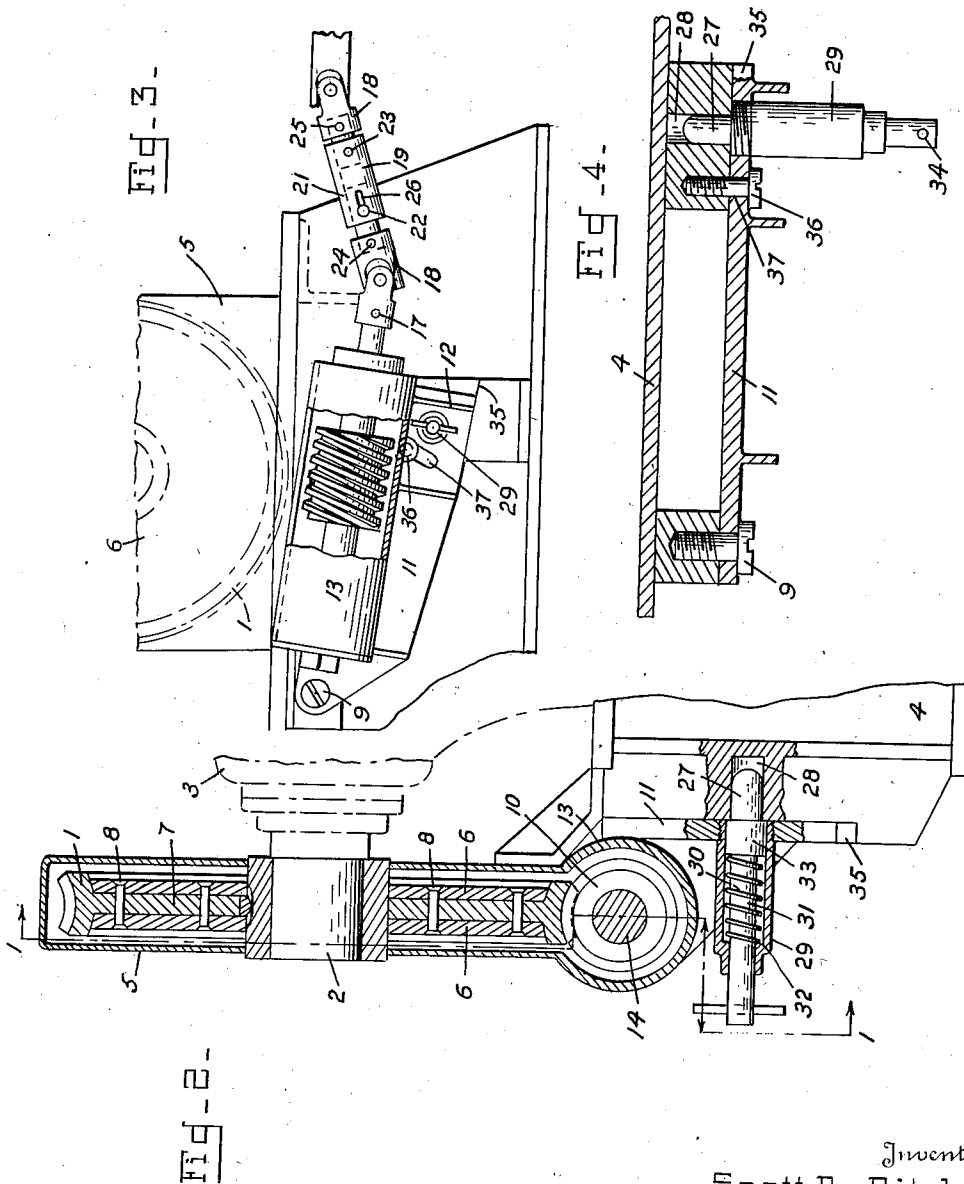
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Inventor
Scott B. Ritchie

By E. Kessnerich & J. H. Church

Attorneys

UNITED STATES PATENT OFFICE

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SLOW-MOTION DRIVE FOR CENTRIFUGAL
CASTING MACHINEScott B. Ritchie, United States Army,
Cootes Store, Va.

Application July 23, 1941, Serial No. 403,761

5 Claims. (Cl. 74—389)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to centrifugal casting machines, and in particular to an auxiliary drive therefor designed to impart slow motion thereto.

The device consists of a worm on a shaft connected to a power supply and universally mounted for dropping out of engagement with a worm gear on the casting mold rotor. In the case where the rotor exceeds the speed of the worm as where the main drive is started with the worm in mesh, the worm is slid out of engagement into an idling position.

Provision of the auxiliary drive permits rotation of the machine at slow speeds (10 R. P. M. for instance) between heats and after the day's run so that cooling of the mold and rotor will be uniform.

It is therefore an object of the invention to provide an auxiliary drive for the rotor of centrifugal casting machines to permit low speeds of rotation.

It is a further object of the invention to provide an auxiliary slow motion drive for the rotor of centrifugal casting machines with provisions for release of the same.

To these and other ends, the invention consists in the construction, arrangement and combination of elements described hereinafter and pointed out in the claims forming a part of this specification.

A practical embodiment of the invention is illustrated in the accompanying drawings wherein:

Figure 1 is a front view of the worm gear mounted on the main motor shaft and showing the worm appendage in axial section.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a view of the worm of Figure 1 in released position, and

Figure 4 is a detail in section taken along the line 4—4 of Figure 1.

Referring to the drawings by characters of reference, there is shown a worm gear 1 fixed to a shaft 2 of a main driving motor 3 seated on a base 4. Gear 1 is surrounded by a guard 5. Gear 1 is braced against lateral bending by means of plates 6 fixed to the webs 7 of the gear by means of pins 8.

Pivoted to the base 4 by means of a screw 9 is a mounting for the worm 10 comprising a back plate 11, webs 12 and cylindrical housing 13. A shaft 14 is supported for rotation in the hous-

ing by suitable bearings indicated generally at 15 and the shaft 14 carries the worm 10 through a key 16 on which the worm 10 is slidable longitudinally of the shaft 14.

Shaft 14 is pinned at 17 to a shaft extension comprising two universal joints 18. Between the universal joints is a separate shaft segment 19. Inner couplers 20, 21 are pinned to the segment 19 as at 22 and 23 and to the shaft ends as at 24 and 25. Pin 22 is engaged in an elongated slot 26 in the central segment to permit extension of the shaft.

When the worm 10 is engaged with its gear 1 it is held in position by means of a pin 27 received in a recess 28 in the base 4. The pin 27 is carried in a projecting cylindrical housing 29 on the back plate 11. A spring 30 surrounding the shank 31 of the pin 27 and engaging against a shoulder 32 in the housing 29 and an enlarged collar 33 on the pin 27 serves to hold the pin 27 in the bore 28. When the pin is withdrawn manually, for which purpose the cross pin 34 is provided, the entire worm assembly will swing down about pivot 9 until it rests on a shoulder 35 on the base 4. Meanwhile rotation may be continued through the universal couplings and the added length of the shaft is compensated for by the slot 26.

The worm assembly may be locked in any position of its swing by means of a screw 36 threaded into the base 4 and passing through a slot 37 in the back plate 11.

It will be seen that the device shown affords a ready and convenient means of rotating a centrifugal casting rotor at low speeds independent of the main driving force.

If the worm should be brought into engagement with the gear while the latter is being driven by the main driving force, or if the main driver should be started while the worm is in engagement the worm will simply be urged along the key 16 and out of engagement, thus affording a novel cooperation between a prime mover and an auxiliary driving system.

I claim:

1. In combination, a prime mover and shaft, a worm gear on said shaft, a second shaft mounted crosswise of said first shaft having a pivotal mounting at one end and a universal joint coupling at the other end, independent drive means connected to said second shaft at the universal joint coupling, and a worm on said shaft for engagement with said worm gear.

2. In combination, a prime mover and shaft, a worm gear on said shaft, a second shaft

mounted crosswise of said first shaft having a pivotal mounting at one end and a universal joint coupling at the other end, independent drive means connected to said second shaft at the universal joint coupling, a worm on said shaft for engagement with said worm gear, and locking means for said worm when in engagement with said worm gear.

3. The combination as in claim 1 wherein said worm is slidable on said second shaft whereby it is disengageable from the worm gear when urged by said worm gear.

4. In combination, a prime mover and shaft, a worm gear on the shaft, a second shaft, a worm on the second shaft adapted to engage the gear on the first shaft, a pivotal mounting for the second shaft at one end thereof, a flexible coupling at the other end of the second shaft, independent drive means for the second shaft, means

including a spring biased pin and cooperating recess for locking the second shaft into position for engagement of the worm and gear, and screw and slot means for locking the second shaft in any position between full engagement of the worm and gear and complete disengagement thereof.

5. In combination, a prime mover and shaft, a worm gear on the shaft, a second shaft having a worm engageable with the gear of the first shaft, a pivotal mounting for the second shaft at one end thereof, a flexible coupling at the other end of the second shaft, independent drive means for the second shaft, and a key on the second shaft to prevent relative rotation of the shaft and the worm, the worm having a keyway cooperating with the key and being slidable axially along the shaft.

SCOTT B. RITCHIE.