

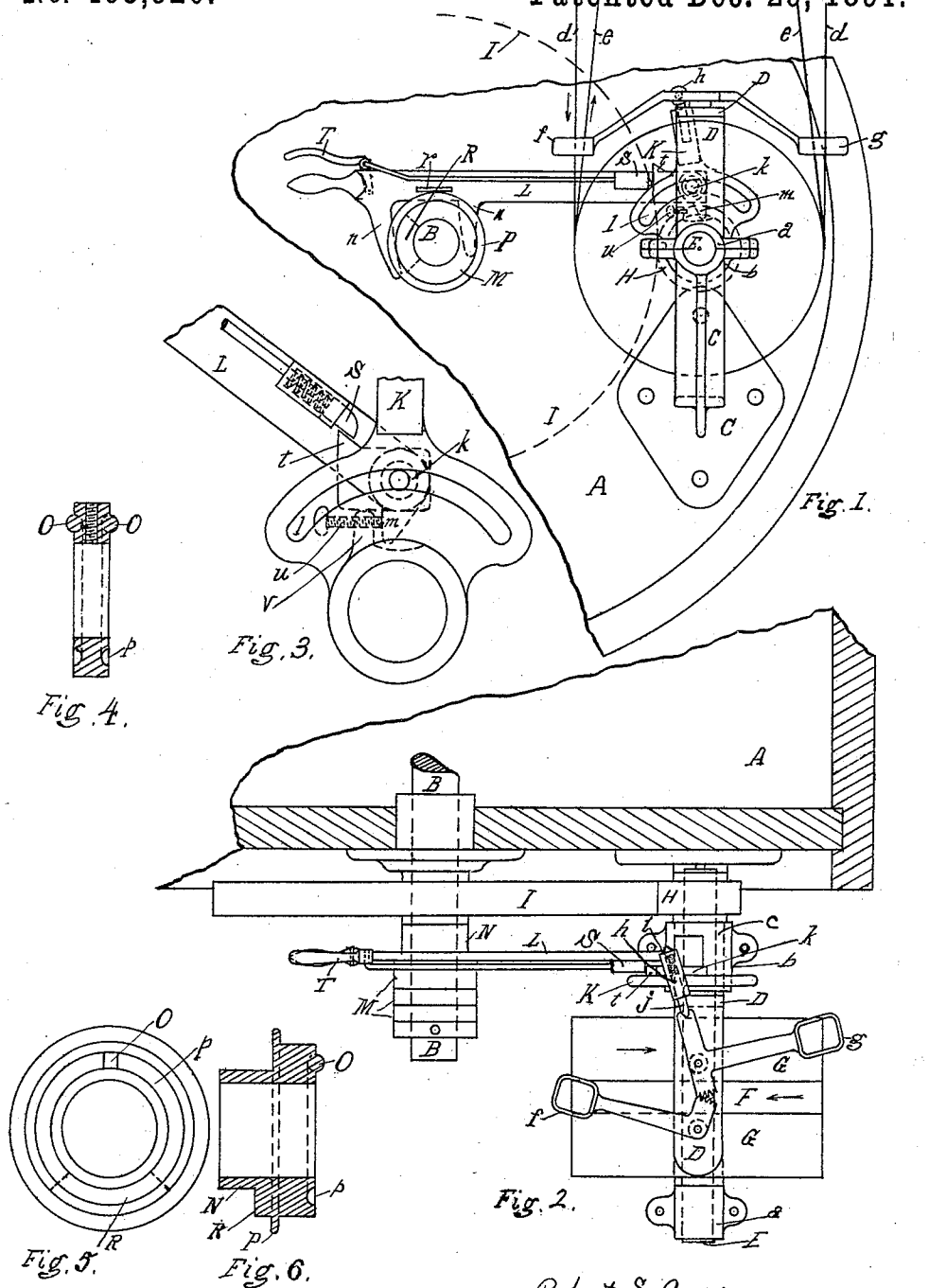
(No Model.)

3 Sheets—Sheet 1.

R. S. CARR & E. J. SCHRODER.  
REVERSING MECHANISM.

No. 465,920.

Patented Dec. 29, 1891.



WITNESSES.

Israel Williams  
C. K. Slomeyer

Robert S. Carr and  
Edwin J. Schroder  
INVENTORS.  
per Robert S. Carr  
ATTORNEY.

(No Model.)

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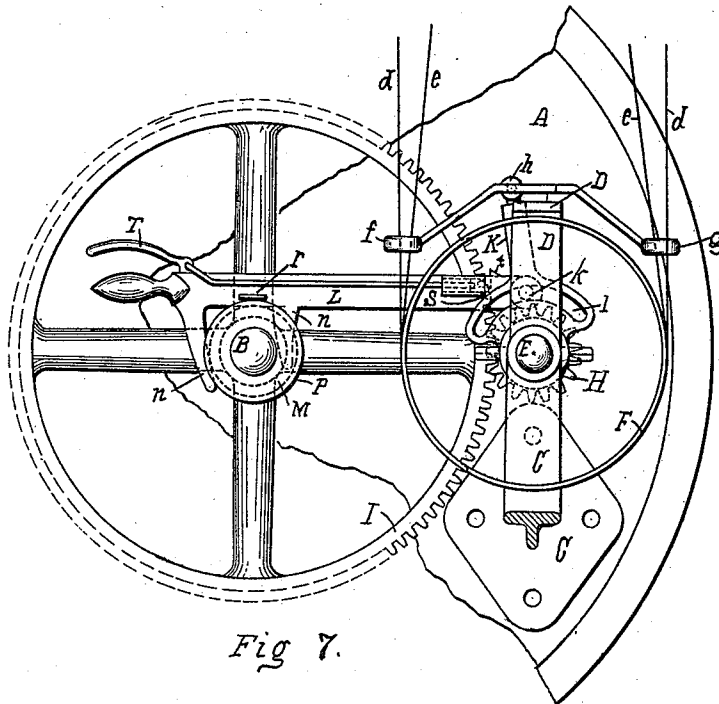


Fig 7.

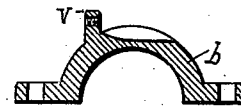


Fig 9.

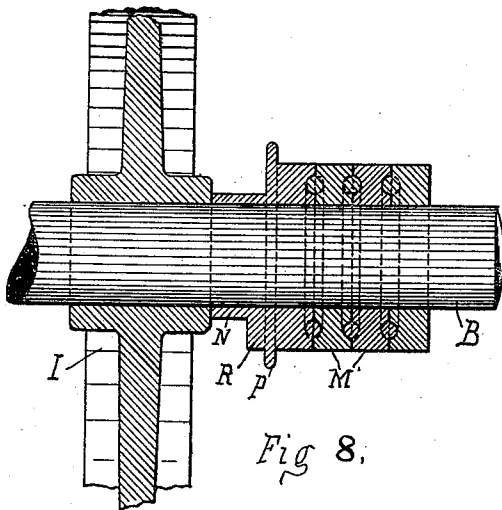


Fig 8.

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(No Model.)

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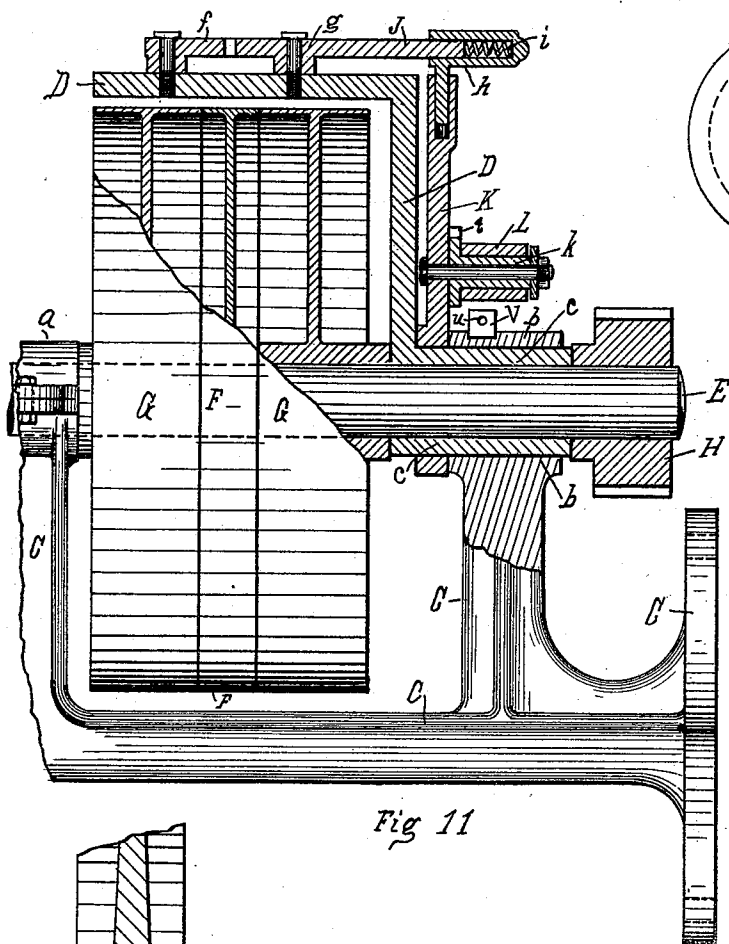


Fig 11

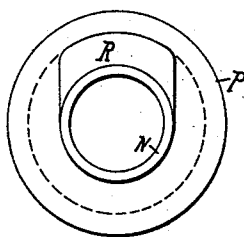


Fig 10

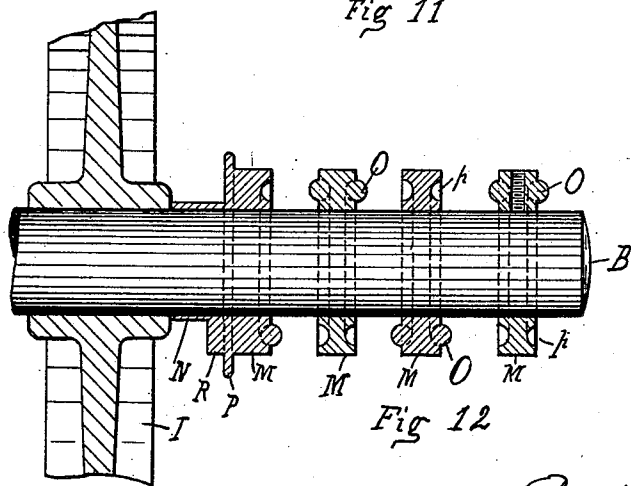


Fig 12

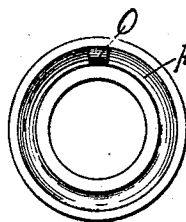


Fig 13.

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# UNITED STATES PATENT OFFICE.

ROBERT S. CARR AND EDWIN J. SCHRODER, OF HAMILTON, OHIO.

## REVERSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 465,920, dated December 29, 1891.

Application filed May 15, 1891. Serial No. 392,933. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT S. CARR and EDWIN J. SCHRODER, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Reversing Mechanism, of which the following is a specification.

This invention relates to improvements in a reversing mechanism of that class driven by belts traveling in opposite directions, being alternately shifted on and off a tight driving-pulley; and the objects of the improvements are to provide adjustments that may be regulated to cause the belts to be automatically shifted when the reversed shaft has described any desired number of revolutions, to retain the driving-belt full on the face of the driven pulley until shifted, and to cause the shifting of the belts to be done instantly. These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation of the mechanism attached to a portion of the end of a washing-machine; Fig. 2, a plan of the same, showing parts of the washing-machine in section; Fig. 3, portions of lever L and radial arm K latched together and enlarged; Fig. 4, a transverse diametrical section of an intermediate ring of the series M enlarged; Fig. 5, an enlarged elevation of the inner ring of series M, and Fig. 6 a transverse diametrical section of Fig. 5. Fig. 7 shows end elevation, with parts in section, of mechanism attached to portion of the end of a washing-machine; Fig. 8, a diametrical section of series of rings and portion of gear-wheel on shaft B; Fig. 9, a vertical section through lug *v* of the cap of journal-box; Fig. 10, end elevation of ring with cam; Fig. 11, enlarged side view of the mechanism, a portion being in section; Fig. 12, a diametrical section of portion of gear-wheel and of rings on shaft B, the rings being disengaged from each other; Fig. 13, an end elevation of one of the rings of series M.

A represents a portion of a cylindrical washing-machine; B, a shaft to be alternately reversed in its direction of rotation; C, a bracket bolted to said machine and constructed with journal-boxes *a* and *b*; D, an angle-plate with trunnion *c*, extending through box *b*, radially adjustable therein; E, a shaft journaled in box *a* and extending through said trunnion; F, a tight pulley, and G loose pulleys on said

shaft, driven by straight belt *d* and crossed belt *e*, that travel in opposite directions; H, a pinion keyed on the extended inner end of shaft E to gear in and drive wheel I, fastened on shaft B; and *f* and *g* shifters for belts *d* and *e*, respectively, pivoted to angle-plate D and geared together to shift said belts simultaneously in the same direction by motion imparted to arm *j* of shifter *g* by radial arm K through swivel *h* in the end thereof, in which arm *j* is transversely inserted against coil-spring *i* therein. Arm K is radially oscillated on trunnion *c* by lever L on hub *k*, fastened to said arm in slot *l* therein. Said lever carries stop *m* and has fingers *n* depending beyond shaft B through curves described from hub *k*. A series of rings M turn loosely on shaft B extended. The outer ring is fastened by a set-screw and turns with said shaft to consecutively gather or take up and turn the other rings of said series by the contact or engagement of lugs O, that travel in grooves *p* in the sides of adjoining rings. Collar N on the inner ring bears against the hub of gear-wheel I. Flange P on said inner ring supports lever L by lip *r*. A cam or lug R on the inner side of said inner ring operates between and alternately against the adjacent edges of fingers *n* to reciprocate lever L. S represents a spring-latch on the side of said lever, operated by thumb-piece T to engage catch *t*, integral with hub *k*, to fasten said lever when raised. The weight of said lever, when fastened, turns arm K until stop *m* rests on the end of thumb-screw *u*, which is adjustable through lug *v*, raised on the cap of box *b*, to stop said arm with the belts on their respective loose pulleys G.

In operation lever L is raised to shift belt *e* on pulley F, then unlatched from catch *t*, and lowered to its normal position. Each revolution of shaft B engages a ring of series M until cam R on the inner ring moves said lever outwardly by its action on finger *n*, which motion of lever L is communicated through arm K, swivel *h*, and arm *j* to the shifters to shift belt *d* on pulley F and belt *e* on its corresponding loose pulley G instantly and simultaneously. The direction of shaft B is consequently reversed and takes up the rings of series *m* in its reversed direction until cam R moves lever L back again by its ac-

tion on the other finger *n* to shift belt *e* on pulley F and belt *d* on its loose pulley G, thus automatically shifting belts *d* and *e* alternately on and off pulley F and reversing the direction of rotation of shaft B. Cam R remains against finger *n* to hold lever L until turned against the opposite finger *n* by the engagement of the rings of series M. Spring *i*, acting against the end of arm *j*, prevents the shifters being moved by the belts. Radial arm K, oscillated by lever L, may be adjusted on hub *k* to the extent of slot *l*, and angle-plate D may be correspondingly adjusted in box *b* to accommodate the shifters to belts having other than a vertical angle. Annular grooves *p* in the sides of the rings of series M terminate against lugs O, integral with said rings. A set-screw may be inserted in each ring to fasten same to shaft B to limit the number of intermediate rings to be engaged and correspondingly reduce the number of revolutions of shaft B until reversed. Any number of rings may be left to engagement by lugs O in series M to regulate the time of reversing shaft B, as desired.

We are aware that prior to our invention reverse mechanisms operated by alternately shifting belts that travel in opposite directions have been made and patented. We therefore do not claim such a combination, broadly; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. In combination, a rotative shaft, a series of rings adapted to engage with and rotate each other, the first of said rings being adapted to be rotated by said shaft, and mechanism for reversing the motion of the shaft and adapted to engage with one of the rings of the series.

2. In combination, a rotative shaft, a series of rings adapted to successively engage with and rotate each other, one of said rings being adapted to be rotated by said shaft, and mechanism for reversing the motion of said shaft and adapted to engage with another of said rings.

3. In combination, a rotative shaft, a series of rings adapted to engage with and rotate each other successively in time, the first ring of said series being adapted to be rotated by said shaft, and mechanism adapted to engage with the last ring of said series for reversing the motion of said shaft in time proportioned to the number of rings in said series.

4. In combination, a rotative shaft, a series of rings provided with lugs adapted to successively engage with each other and to rotate the rings of said series, respectively, the first ring of said series being adapted to be rotated by said shaft, and mechanism for reversing the motion of said shaft and adapted to engage with the last ring of said series.

5. In combination, a rotative shaft, a series of rings thereon adapted to engage with and rotate each other successively during corre-

sponding partial rotations of said shaft, the first of said rings being secured to said shaft, and mechanism for reversing the motion of the shaft, said mechanism being adapted to engage with the last of said rings.

6. In combination, a rotative shaft, a loose ring thereon, means engaging said shaft with said ring, a cam on said ring, and mechanism for reversing the motion of the shaft and adapted to engage with the cam.

7. In combination, a shaft journaled in bearings and extending outwardly, a ring adapted to turn thereon and being provided with a cam, means engaging with said shaft and adapted to engage with and rotate said ring after said shaft has described a number of partial rotations, and mechanism for reversing the motion of the shaft and being adapted to engage with said cam.

8. In combination, a rotative shaft, a plural number of rings thereon and adapted to engage with and turn each other, one of said rings being secured to said shaft, a cam secured to another of said rings, and a lever pivoted to mechanism for reversing the motion of said shaft and adapted to engage with said cam.

9. In combination, a rotative shaft extended beyond its bearings, a ring thereon provided with a cam, means engaging with said shaft and adapted to engage and turn said ring, a lever pivoted to mechanism for reversing the motion of said shaft, and fingers depending from said lever in curves described from the point where said lever is pivoted and adapted to engage with said cam.

10. In combination, a shaft provided with a tight pulley and capable of being rotated in either direction by the action of separate belts, respectively, on the pulley, mechanism for alternating the belts of the pulley, and a series of rings adapted to engage with each other and with said mechanism, means adapted to communicate the motion from said shaft to the first of said rings, said rings being adapted to impart motion to said mechanism after a number of partial rotations of said shaft, proportioned to the number of rings in engagement in said series.

11. In combination, a pulley capable of being driven in either direction by separate belts, respectively, a series of rings adapted to engage with and rotate each other successively, mechanism engaging with said pulley and with the first of said rings, a cam on the last of said rings, a lever adapted to engage with said cam, and mechanism engaging with said lever for alternating the belts on the pulley.

12. In a reversing mechanism, the combination of a radial arm pivoted in relation to the axis of a journal-box and adapted to oscillate in a plane vertical thereto, mechanism for alternating separate belts on a pulley, said mechanism being adapted to engage with said radial arm, a lever pivoted at one end to said radial arm and adapted to engage with a cam,

and means to fasten said lever in relation to said radial arm when disengaged from said cam.

13. A reversing mechanism having, in combination, a radial arm pivoted at one end in relation to the axis of a journal-box and adapted to oscillate in a plane vertical to said axis, a lever adapted to engage with a cam and being pivoted to said radial arm, a stop depending from said lever, means to fasten said lever in relation to said radial arm, a lug extending upwardly from said journal-box to intercept said stop, and means of adjustment between said lug and stop.

14. A reversing mechanism having, in combination, an angle-plate trunnioned in a journal-box and radially adjustable therein, belt-shifters connected to said angle-plate, a radial arm provided with an annular slot and adapted to oscillate on said trunnion, a swivel engaging said radial arm with said belt-shifters, and a lever adapted to engage with a cam and being adjustably connected to said radial arm in said slot.

15. A reversing mechanism having, in combination, a radial arm adapted to oscillate in a plane vertical to the axis of a journal-box and being provided with an annular slot, a pivot or hub being adjustably secured to said radial arm in said slot and being provided with a catch, a lever engaging with said pivot, and a latch on said lever adapted to engage with said catch to fasten said lever in relation to said radial arm.

16. A reversing mechanism having, in combination, a radial arm adapted to oscillate in a plane vertical to the axis of a journal-box, a lever adjustably pivoted by one end to said radial arm, mechanism adapted to fasten said lever in relation to said radial arm, and means to hold said radial arm at rest midway of its oscillation by the weight of said lever.

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