To all whom it may concern:

Be it known that we, CHARLES F. SCHMIDT, and CHARLES KLEINKNECHT, of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in a Combined Washing-Machine and Drier, of which the following is a specification.

This invention is an improvement in machines for washing and drying clothing and similar articles made of textile fabrics, and especially in that class of machines represented by our former patent, No. 707,867, dated August 26, 1902; and the present invention consists in certain novel construction and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 represents a plan view of the machine partly in section; Fig. 2, a side elevation and partial horizontal section; Fig. 3, a view of the cam mechanism and part of the clutch; Fig. 4 shows the combined clutch and gear sleeve; and Fig. 5 a view in front elevation of the treadle and catch.

I designate a cylindrical casing having at its lower end a tight-fitting or integral head 2, resting upon the legs 3. At its upper end is a cover a part of which, 4, is secured to the walls of the casing and the remaining, 5, hinged to the fixed part in such manner that the interior may be accessible. On the fixed cover are bearing-brackets 7 and 8, carrying a shaft 9, which has at its outer end the driving-pulley 10 and a fly-wheel 11. Inside the bracket 7 is a sleeve 12, keyed to turn with the shaft, but free to move lengthwise thereon. Integral with the sleeve are two gears 13 and 14, of different diameters, and a clutch 15 for moving the sleeve on the shaft. A lever 16, having a yoke 17 operatively connected to the sleeve 12, is fulcrumned at 18. Beyond the bracket 8 on the same shaft is secured a cam 19 and adjacent to it a miter-gear 20, which meshes with its mate, 21, which is secured on a shaft 22, placed at the same height, but at right angles to the shaft 9 and which has the bearing 23 at one end. A sleeve 24 runs freely on this shaft, having on it the spur-gear 26 and the friction-clutch 27. 28 is the other clutch member, the tubular shank of which is fitted to revolve in bearing 24 and contains the opposite end of shaft 22, adapted to revolve freely with it.

The end of the clutch-shank 28 extends slightly beyond the bearing 24, and in alinement with it is the short lever 29, fulcrummed on a shaft 30, maintained in the portion of the bracket 24 at right angles to the shaft 22 and at a short distance above it. On the other end of the shaft 30 is secured the lever 31, carrying an adjustable roll 32 and at its extreme end a helical spring 33, adapted to pull the lever downward, which action keeps the roll 33 against the periphery of the cam 19.

It is obvious that if the lever 31 be raised by the cam or otherwise it will cause the short lever 29 to impinge upon the extending end of the clutch member 28, cause it to slide forward into close contact with the other member, 27, and, if the machine be running, will transmit motion to the spur-gear 26. This action will be maintained until the lever 31 is lowered by being drawn down by the spring 33 as the roll works on the small radius of the cam 19, which may be so proportioned as to give any desired amount of revolution to the gear 26.

34 is a bracket having guideways for the vertical slide 35, which has teeth cut in its front edge to engage with the spur-gear 26. It is provided with a boss on one side for the clamping-screw 36, used to hold the sliding rack up out of engagement with the gear when desirable.

37 is a catch on the top of the guideway, adapted to hold the hinged cover 5 open when desired.

The lower end of the rack-slide 35 extends through an opening in the casing-cover 5 and has attached to it a circular beater 38, having a hinged leaf 39, a sliding bolt 40, and a pin 41 for fastening the bolt, so that the hinged part 39 shall not open when properly secured. The bottom side of 38 and 39 are corrugated,
and the whole is of considerable weight, so that these parts will act effectively as beaters.

From the foregoing it is evident that the instant that the clutch members 27 and 28 are separated the weight of the slide and its attached parts will cause the gear 26 and its sleeve to revolve freely until the downward motion of the slide is arrested. It is also evident that at whatever point it may stop the gear will pick it up upon application of the lever and carry it a predetermined amount vertically without reference to its initial position. Hence the blow of the beater is uniform whether the machine be filled fully or partially.

Within the casing 1 is a tub 42 open at the top and in which is loosely fitted the beater 38. This tub has corrugated sides to assist in cleaning the articles operated upon and has numerous perforations to allow for water circulation. At its bottom is a head 48, grooved underneath for a ball-raceway 44 and which normally rests on a circle of balls therein that in turn rest in the corresponding groove in the head 2 of the casing. Head 48 has also affixed at its center a downwardly-extending shaft 45, running through the plate 2, which forms a bearing for it, carrying bevel-gear 46, and is further guided in the bracket 47, which is attached to the lower side of the plate 2. The bracket 47 also forms a bearing for a horizontal shaft 48, carrying a bevel-pinion 49, meshing with 46 at one end and, passing through the bearing 47, has a sprocket-wheel 50 at the other. This wheel is connected by a chain 51 with a corresponding sprocket-wheel 52 on the shaft 53, which runs in bearing-brackets 54 and 23. On the shaft 53 are the fixed gears 55 and 56, adapted to mesh with the spur-gears 13 and 14, respectively, by action of the lever 16. The arrangement is such that the gears 55 and 13 work together and 56 and 14; but both pairs of gears cannot be in engagement at the same time. The proportion between the two pairs is such that when 55 and 13 are in engagement a comparatively slow motion is obtained and the tub 42 revolves slowly; but when the gears 56 and 14 are in engagement a much higher rate of speed is delivered to the tub 42, the said higher speed being desirable in the operation of drying, the centrifugal effect being to force the water outwardly through the openings in the tub to the space between it and the casing 1, from which it may be withdrawn by the faucet 57 or other convenient means.

In practice, however, it has been found that while the ball-bearing between the heads 2 and 43 is well adapted to the slow speed of washing and to take the constantly-occurring impact of the beater 38 better results are obtained by raising the shaft 45, and through it the plate and tub, free of the ball-bearing and sustaining their weight on the pivot-bearing 58, which is arranged on the end of the foot-lever 59.

60 is a catch attached to the floor to hold the lever 59 when depressed, and consequently sustaining the weight of the tub and its contents.

In operation, the machine being at rest, the hinged covers 2 and 39 are raised and the articles to be washed are placed within the revolving tub, the covers secured, and water, with cleansing agents, introduced by any convenient means, as direct piping, hose, or bucket, the foot-lever is released, so that the tub rests on the balls, the speed-changing lever moved to cause engagement of the slow-acting gears, the clamp-screw loosened, and the beater allowed to rest on top of the articles the tub is charged with. Upon applying power the tub revolves, causing the water to freely circulate through the charge, and at short regular intervals the beater falls, causing a churning, effectually forcing the fluids among the articles comprising the charge and through the interstices of the textile fabrics of which they are made. In addition it causes the articles to rub upon each other and against the corrugations of the tub sides until the cleansing operation is complete. Obviously the water may be withdrawn at will and the machine recharged with fresh or a constant circulation kept up without affecting these operations, so that a thorough rinsing is obtained.

The operation of drying is performed without disturbing the charge and is as follows: The machine being stopped momentarily, the beater raised to its highest point and there secured by the clamp-screw, the treadle or foot-lever is depressed and held down by the floor-catch, the speed-changing lever moved so that the pair of gears used in washing are disengaged and the other pair put into engagement, the water-drain opened, and the machine restarted. The high rate of speed obtainable rapidly drives out all particles of moisture after the manner of an ordinary "whizzer," and the articles can then be removed for final airing, as is usual.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a combined washing and drying machine, the combination of a revolving tub, a stationary casing, means for revolving said tub at different rates of speed, and a beater-head, having a uniform drop, irrespective of the quantity of charge, all substantially as shown and described.

2. In a combined washing and drying machine, the combination of a tub; a beater therein, having a rack-stem; a gear intermeshing with the rack; a friction-clutch member, integral with the gear; a sliding clutch member, and means for operatively connecting the said members, consisting of a lever, a cam and roll, all substantially as shown and described.
3. In a combined washing and drying machine, the combination of a revolving tub, within a stationary casing; the bottom of said tub normally resting upon a ball-bearing; means for raising the said tub out of engagement with the ball-bearing; means for supporting the said tub, when so raised, on a central pivot, and means of rotating said tub at different rates of speed independent of speed of driving-shaft, all substantially as shown and described.

4. In a combined washing and drying machine, the combination of a revolving tub within a fixed casing; a perpendicularly-acting beater therein, having a rack-stem; an intermittently-operated gear, engaging with said rack-stem; means for controlling the engagement between said rack and gear, and means of controlling speed of tub independent of speed of prime mover, all substantially as shown and described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

CHARLES F. SCHMIDT.
CHARLES KLEINKNECHT.

Witnesses:
Leonharetz Kohlmaas,
John M. Enburg.