

May 24, 1932.

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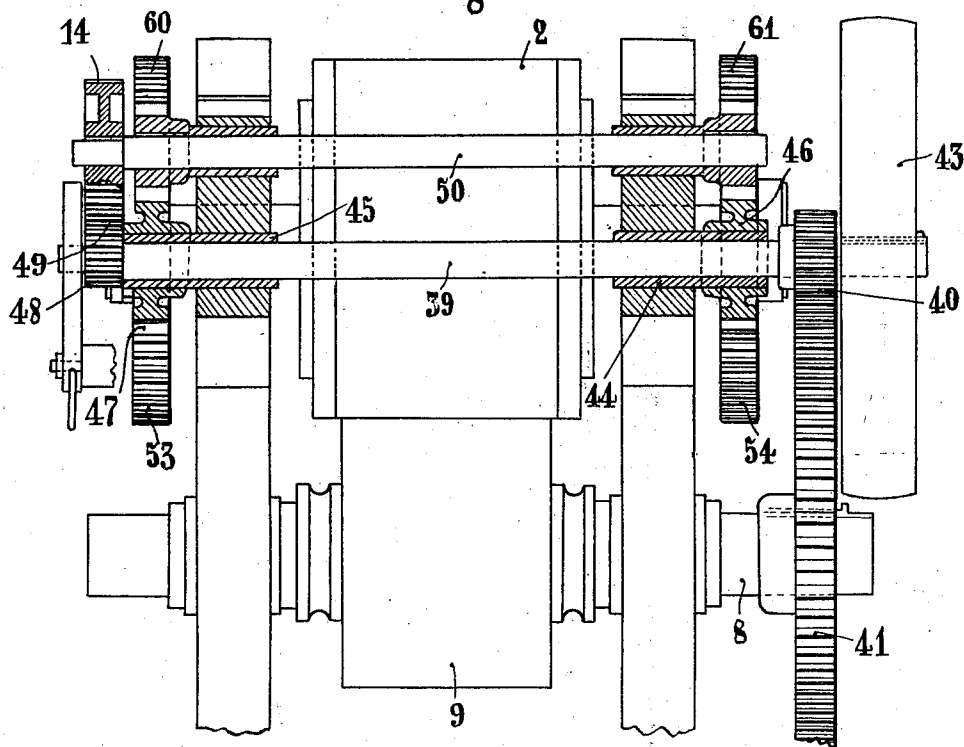
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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7 Sheets-Sheet 1

Fig. 1.



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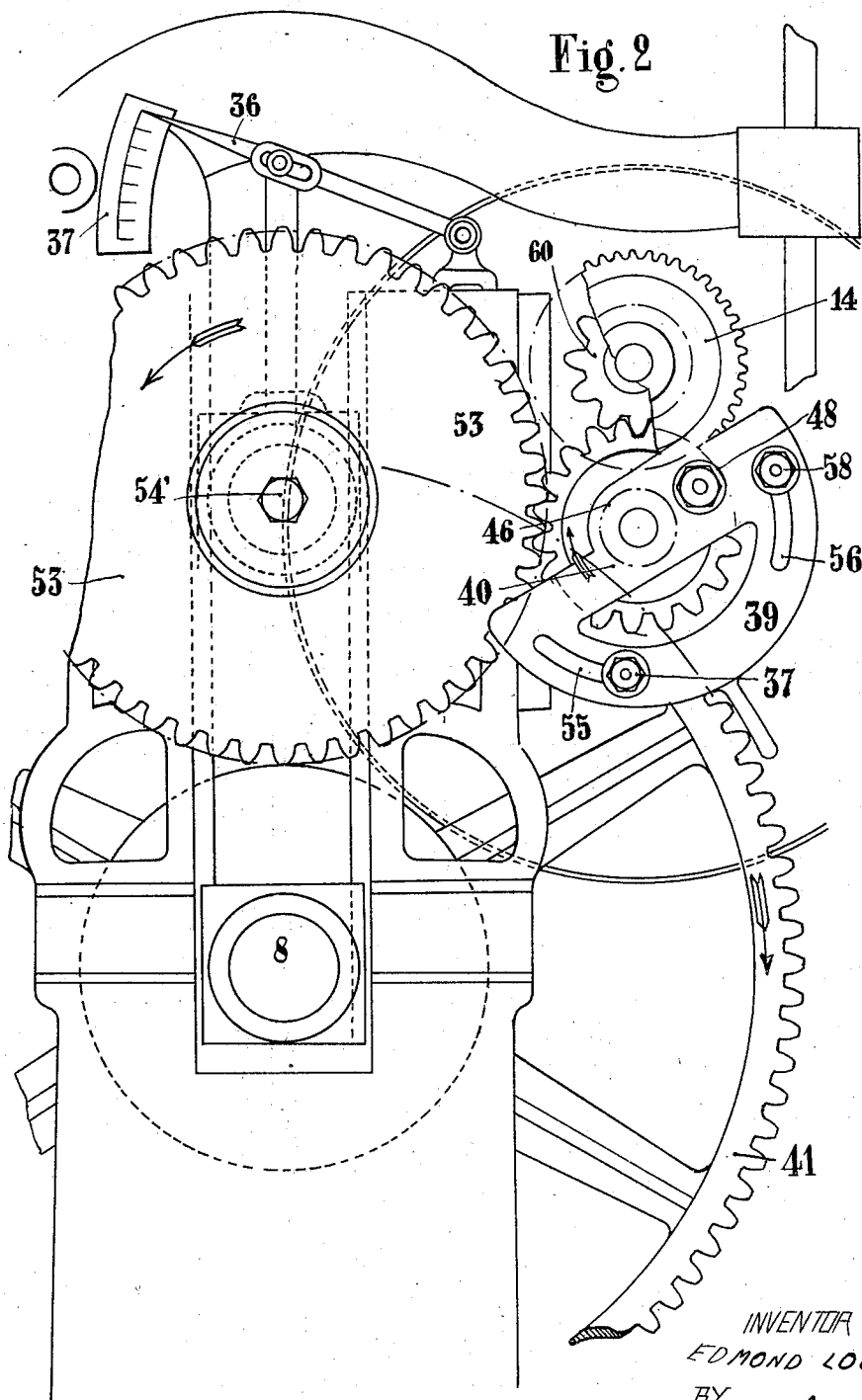
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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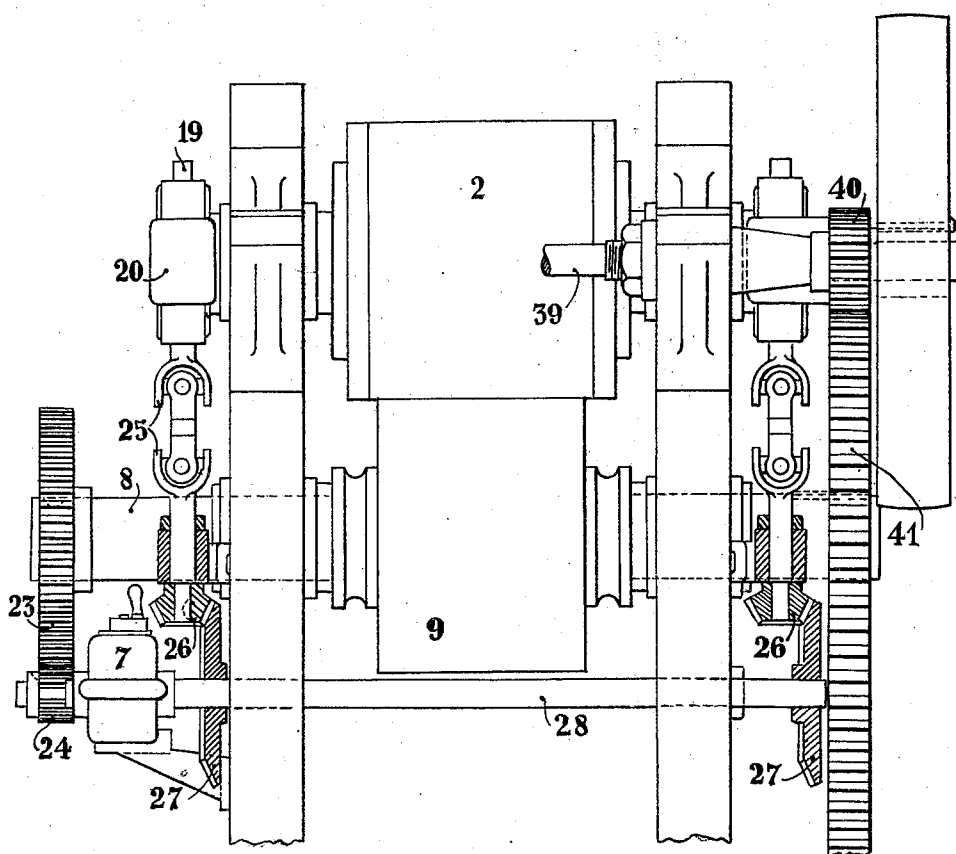
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Fig. 3



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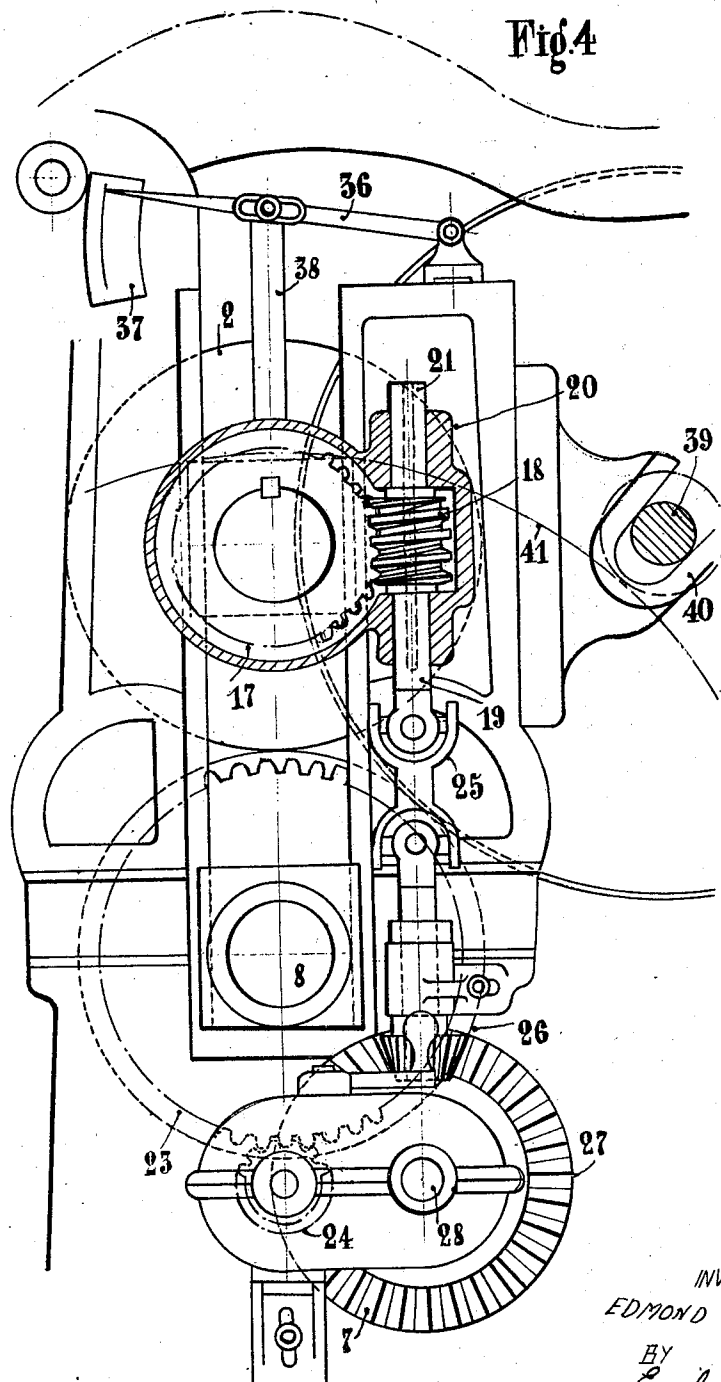
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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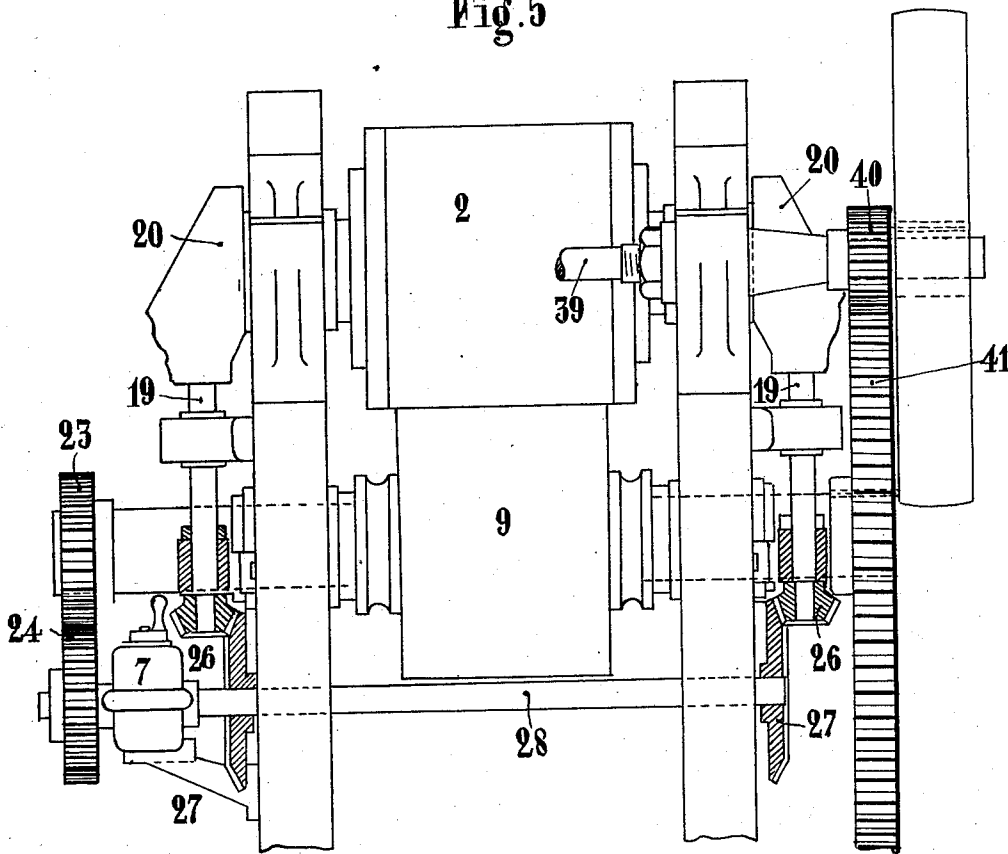
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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Fig. 5



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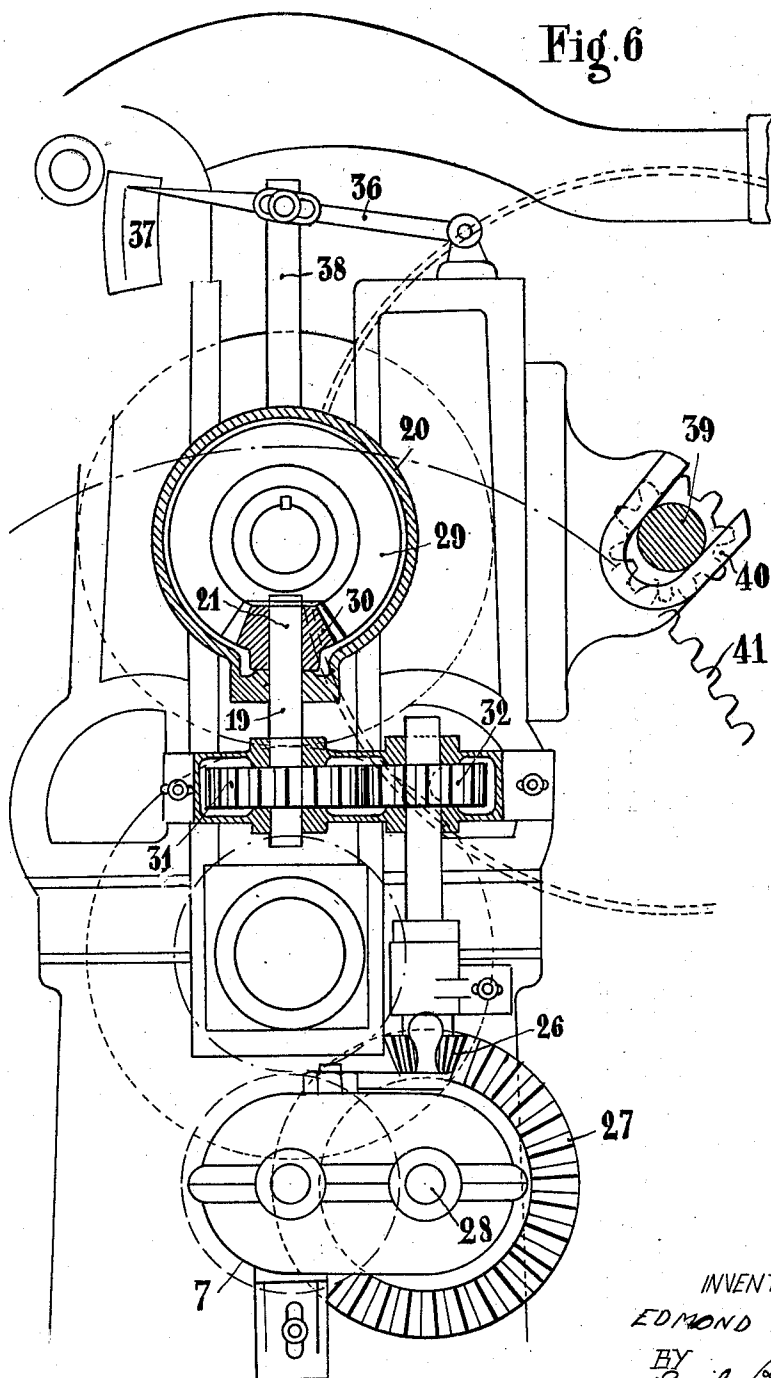
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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Fig. 6



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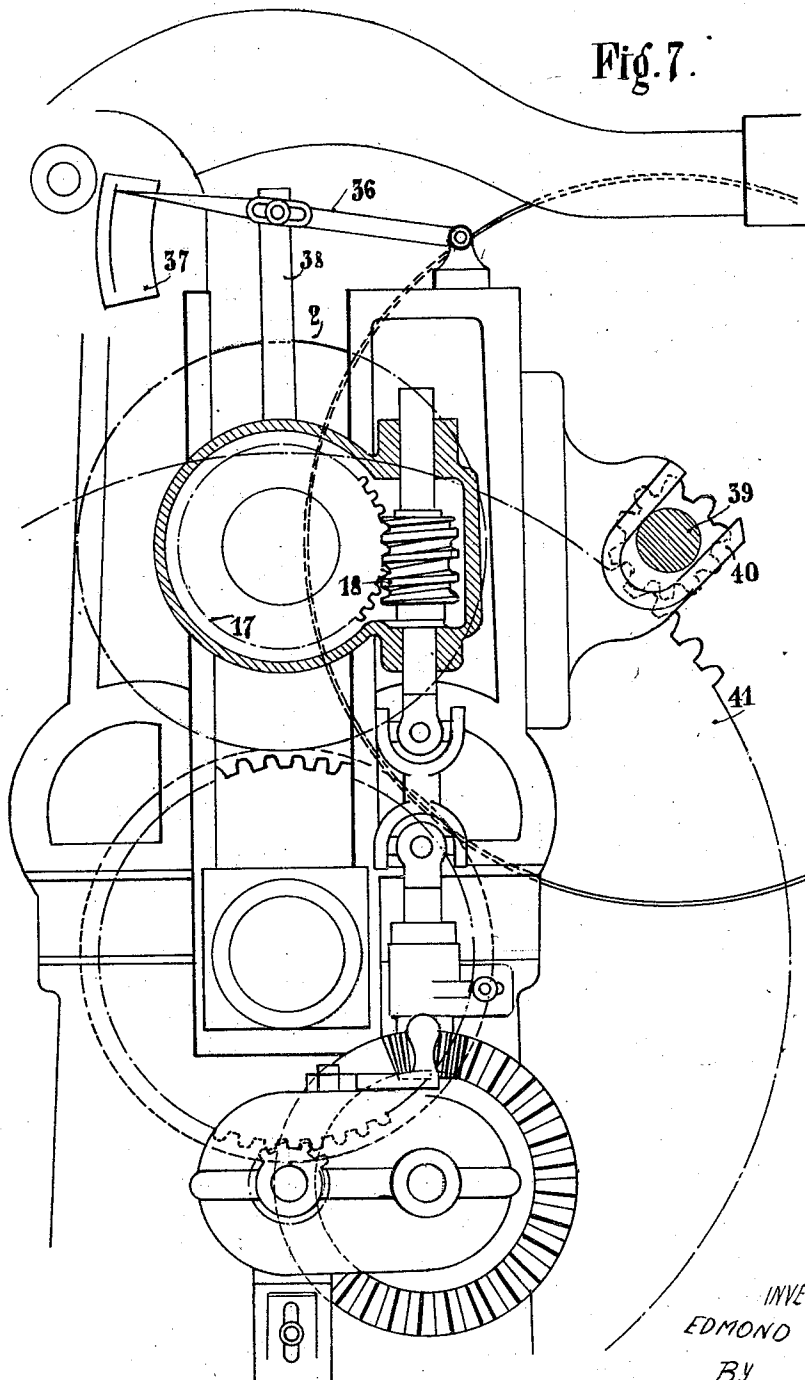
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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

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UNITED STATES PATENT OFFICE

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GEARING ARRANGEMENT OF MANGLING OR WRINGING MACHINES

Application filed July 30, 1928, Serial No. 296,362, and in France July 29, 1927.

The presses used in the washing of wool and other textile matters show serious inconveniences from the viewpoint of the sparing of the matter to be squeezed as well as of the preservation of the more or less plastic lining of the upper roller of these presses, on account of the fact that the mode of driving of said upper roller through long-toothed gearing between both the upper and lower rollers causes:

First. An instantaneous variation in the speed of said upper roller every time a new tooth passes along; and

Second. A difference in the speeds of the rollers, resulting from the upper roller being driven by long-toothed gearing and at the point of tangency of both rollers, when the effective diameter of said upper roller is changed as a result of wear or, again when the thickness of the sheet being squeezed is not uniform.

This difference is the more objectionable in that the stress is applied where the rollers contact with one another and is most considerable on account of the great pressure which must exist between both rollers if an effective squeezing effect is to be obtained. In order to reduce in a certain proportion such disagreement, the long-toothed gear of the upper roller is not, generally, keyed on the shaft of said roller, but is driven by means of a pawl or trigger, a ratchet-wheel being integral with the shaft of the upper roller which can, at given times and on account of the slope of the ratchet teeth, travel at an angular speed greater than that which would result from a long-toothed gear drive.

When such device comes into action (which it can do in one direction only), then the driving of the upper roller takes place through the point of contact, which is detrimental to the material to be squeezed, said material undergoing a frictional strain which is greater inasmuch as the motion of the upper roller is different from that which is transmitted by the long-toothed gears.

My invention has for its object a device by which said inconveniences are obviated, the long-toothed gears being dispensed with and the driving of the upper roller being ob-

tained through an intermediate member, the axis of which is positioned, as far as possible, on a line substantially level with the center of the upper roller in the non-operative position of the latter.

This intermediate member by which my invention is characterized in its chief object may be interposed in the driving mechanism either between both rollers or between the main drive and each roller. It may consist, for instance, of a worm spindle and wheel, bevel or spur gears or any other known means, such means being, in addition, combined so that the movement of rotation of the upper roller may be made wholly or substantially independent of the lift of said roller in the ordinary limits of practice.

The drawings appended hereto show, for mere indicative purposes, some possible embodiments of my above mentioned improvements.

Figures 1 and 2 show, in front and side views respectively, one of these embodiments, Figure 1 being partly in section.

Figs. 3 and 4 and Figs. 5 and 6 are, respectively, views similar to Figs. 1 and 2 and show modifications of the invention.

Fig. 7 is a view similar to and illustrating a modification of Fig. 4.

The press shown in Figures 1 and 2 derives its motion from a belt which drives pulley 43 keyed on shaft 39. A gear 40 keyed on said shaft 39 drives, through gear 41, the shaft 8 of the lower roller 9 of the press. On the same shaft 39 are mounted sleeves 44 and 45 on which gears 46 and 47 are free to rotate. On the other hand, the finely toothed gear 48 is keyed at the end of shaft 39. This gear drives, through a suitably mounted idle gear 49, the removable or detachable gear 14. The latter rotates shaft 50 on which it is keyed and which bears heavily toothed pinions 60 and 61. These two pinions drive, through the above mentioned loose gears 46 and 47, gears 53 and 54 fixed to shaft 54' of the upper roller of the press.

As gears 46 and 47 mesh with gears 54 and 53 on a substantially horizontal line it follows that the upper roller of the press is able, together with its shaft 54', to rise an

appreciable distance without any likelihood of the gears 46 and 47 becoming disengaged from gears 54 and 53. The mechanical drive of the upper roller is thus ensured, whatever thickness the layer of wool interposed between rollers 2 and 9 may be, much more effectively than by ordinary long-toothed gears, a constant ratio being at the same time maintained between the driving and the driven parts. By having the center of gear 46 just below the level of shaft 54' when the upper roller 2 has undergone no wear yet, such upper roller may be allowed to wear a considerable amount without losing the benefit of this regular drive.

The removable or detachable gear 14 at the end of shaft 50 may easily be replaced. Its number of teeth determines the speed ratio of rollers 2 and 9 of the press.

The intermediate gear member 49 borne by a stub shaft on a semi-circular plate 49' rotatable on shaft 39 and secured by means of slots 55 and 56 and nuts 57 and 58 takes care of the driving (Figure 2). The changes in the angular speed of the roller are obtained by the provision of limited weight and easily fitted gears of which it is not expensive to have a set in stock. Practically it is sufficient to have a set of gears which differ in their numbers of teeth by two successively. With a seven gear set it is possible to obtain the theoretical speeds for the upper roller notwithstanding a wear amounting to 14 centimeters on the diameter of such roller.

As gears 46 and 47 apply on upper roller 2 an upward stress proportional to the resistance of the press to operation it follows that, by such driving arrangement, the press takes up the material under treatment most easily and that there is much less liability for the wool to pack or accumulate in advance of the rollers.

Whatever the position of the upper roller may be in the limits of practice, the speed of the latter as results from being driven by the intermediate members remains always constant but, considering the moment when said upper roller rises or descends, the speed is not absolutely constant.

As regards the pressure between both rollers, it diminishes when roller 2 has to rise on account of a thicker sheet being fed, which reduces the tendency for the press to cease operation when confronted with an over-thickness.

In the case of Figures 3 and 4, a worm gear 17 secured to upper roller 2^a meshes with a worm 18 which moves along its vertical driving shaft 19 by means, for instance, of a gear casing 20 containing said worm wheel, so that the upper roller 2^a is always accompanied in its vertical movement by said worm. A long key 21 ensures the driving of the worm by its shaft 19 in every position of elevation of the former. The

gear box 7^a allows the speed of the upper roller 2^a to be varied. Said gear box is driven by shaft 8^a of the lower roller 9^a through pinions 23 and 24, and a double Cardan joint 25 prevents any jarring in case the upper roller should rise a greater amount on one side than on the other. The vertical shaft of the Cardan joint is driven by bevel pinion 26 and a bevel gear 27, the latter being keyed on shaft 28 of the gear box.

Figures 5 and 6 show that both worm wheel and worm may be replaced by two bevel gears 29 and 30. Gear 30 is driven by key 21 fixed on shaft 19^b. The latter is driven by means of spur gears 31 and 32, bevel pinion 26, bevel gear 27 and the gear box 7^b.

In the two above mentioned cases (Figures 3 and 4, 5 and 6) an angular speed of the upper roller 2^a or 2^b, completely independent of the lift of said roller, is obtained.

In the particular case of Figure 7, a worm 18^b is fixed in position by being keyed on its vertical driving shaft. Such arrangement gives an approximate solution, inasmuch as every vertical displacement of the upper roller 2^b causes a slight variation in its movement of rotation, said acting, then, as a rack with respect to the worm wheel 17^b.

In the cases of Figures 3 and 4 (movable worm) and Figures 5 and 6 (movable bevel gear), the pressure between the two rollers is entirely independent of the upward or downward movement of the upper roller 2^a or 2^b; the vertical stress between the worm 18 and worm wheel 17, and between the bevel gears 29 and 30, being cancelled by the reaction of the casing 20 fixed to the said upper roller.

In the arrangement of Figure 7 (fixed worm), the pressure between the two rollers diminishes when the upper roller 2^b is about to rise; so that here again there is a reduction of the likelihood of failure of the press to operate through clogging of the rollers.

In all the above mentioned embodiments the number of the exchangeable pinion, or the position at which the handle of the gear box must be set may, for instance, be indicated by means of a pointer 36 moved across an indexed dial 37 by means of a rod 38 connected to the shaft of the upper rollers 2, 2^a and 2^b. It need not be mentioned that, instead of being positioned between the upper and lower rollers, the intermediate members may be interposed between the upper roller and the main drive shaft 39 of the press or between each of the rollers and said shaft 39. Inasmuch as the number of revolutions of the latter, for instance in the presses of washing machines, is generally tenfold that of the lower roller which it drives through pinions 40 and 41, it is easier to use small-sized pinions as intermediate members.

Having now particularly ascertained and described the nature of my said invention as

well as the manner in which the same is to be performed, I declare that what I claim is:

In a press for squeezing textile or other materials, upper and lower pressing rollers
5 between which the material is fed by the pressure of the rollers, means for applying power to the lower roller, intermediary gear trains imparting rotary motion to the upper roller substantially independently of lift of
10 that roller due to passage of a portion of the material of abnormal thickness between the rollers, the gear elements of said intermediary gear trains transmitting power to the upper roller being located in a plane substantially horizontal with the axis of the
15 upper roller; a main drive shaft, and a connection between the same and the lower roller, the rotation of the upper roller being effected by said shaft through the intermediary gear trains; an auxiliary shaft whereon the gears
20 of the intermediary gear trains which impart rotary motion to the upper roller are mounted for rotation independently of each other; a pinion fixed for rotation with said auxiliary shaft; a plate mounted for angular
25 adjustment at one side of the press; means for holding said plate in positions of adjustment; a rotary pinion mounted on said plate in mesh with the first-named pinion; a shaft
30 mounted parallel to the auxiliary shaft; and a heavily-toothed gear mounted on each end of the auxiliary shaft and meshing with the said gears of the intermediary gear trains which impart rotary motion to the upper
35 roller, thereby to permit the upper roller to rise a reasonable distance without separation of the meshing gears.

In testimony whereof I affix my signature.

EDMOND LOUCHET.