(No Model.) 2 Sheets—Sheet 1.

J. H. THERIEN.

REVERSING GEAR.

No. 592,483. Patented Oct. 26, 1897.

FIG. 1.

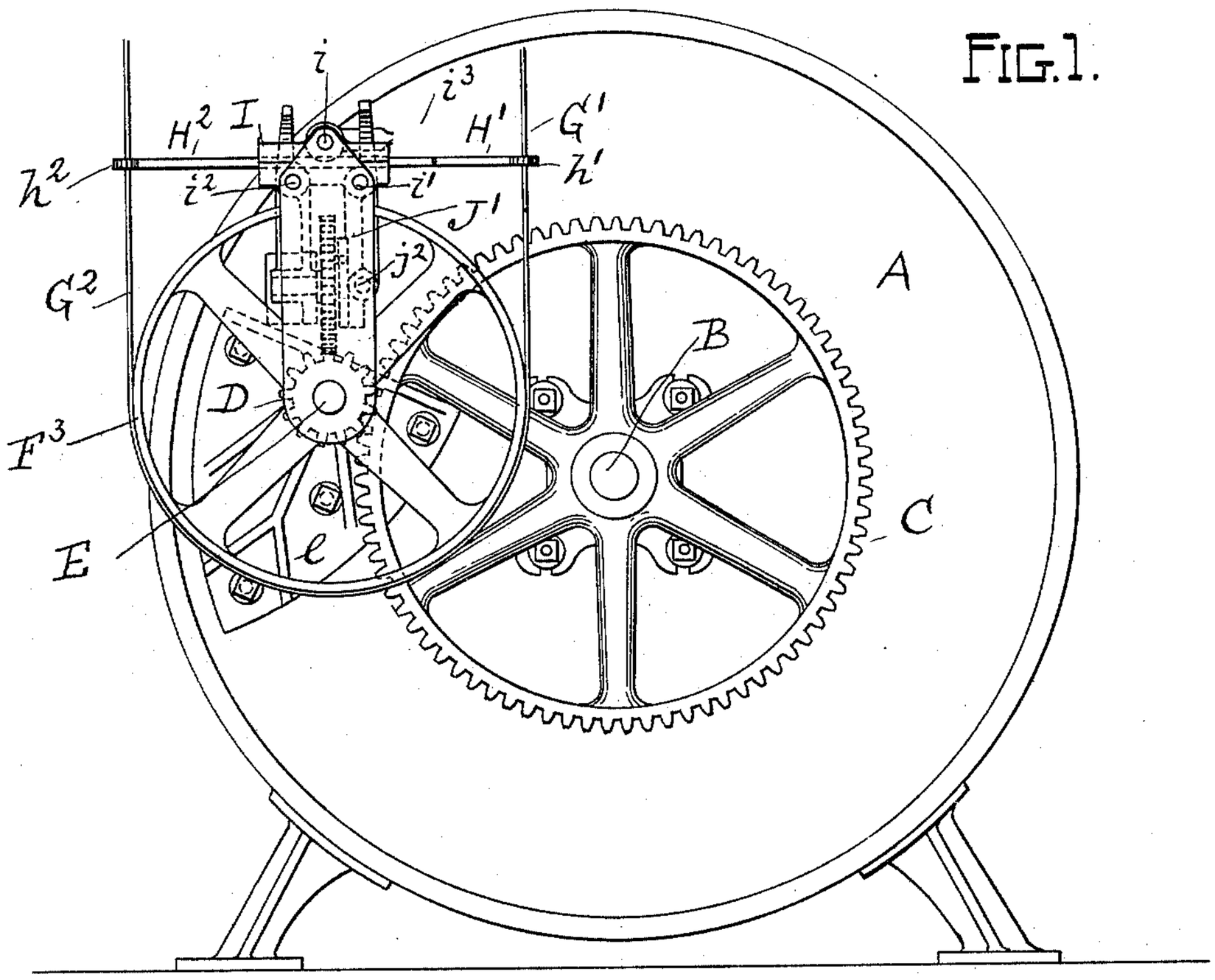
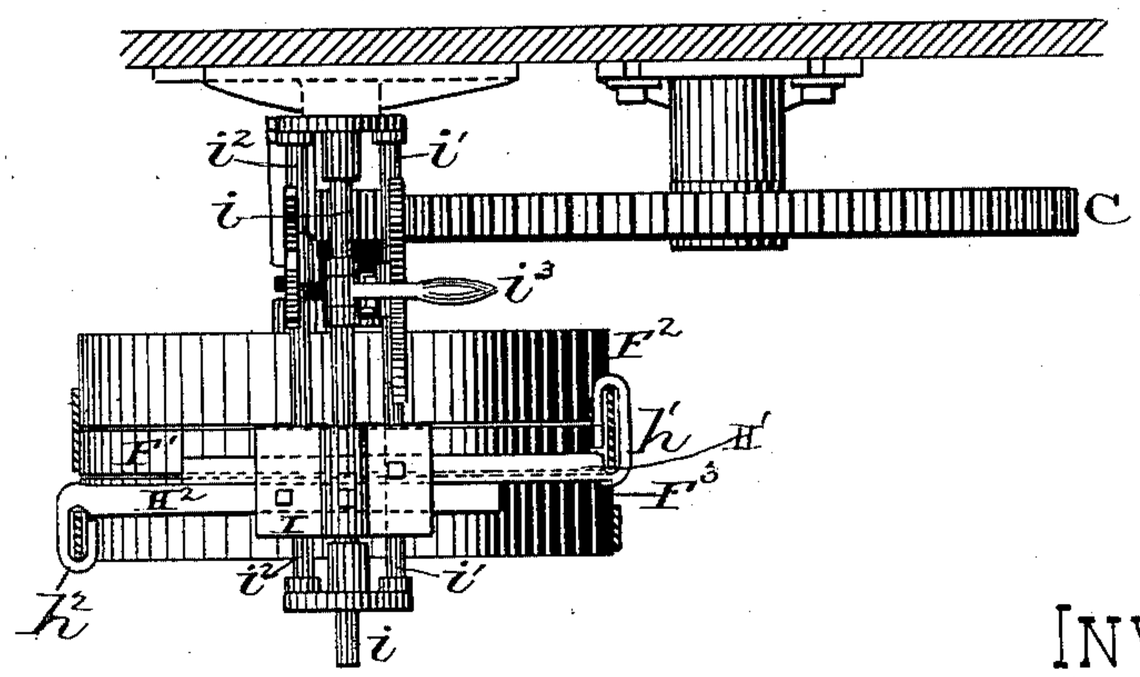


FIG. 2.



WITNESSES

Fabius D. Finch

Benjamin Romaine.

INVENTOR

Joseph H. Therien

by A. H. Ste. Marie

atty

(No Model.)

2 Sheets—Sheet 2.

J. H. THERIEN.

REVERSING GEAR.

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FIG. 3.

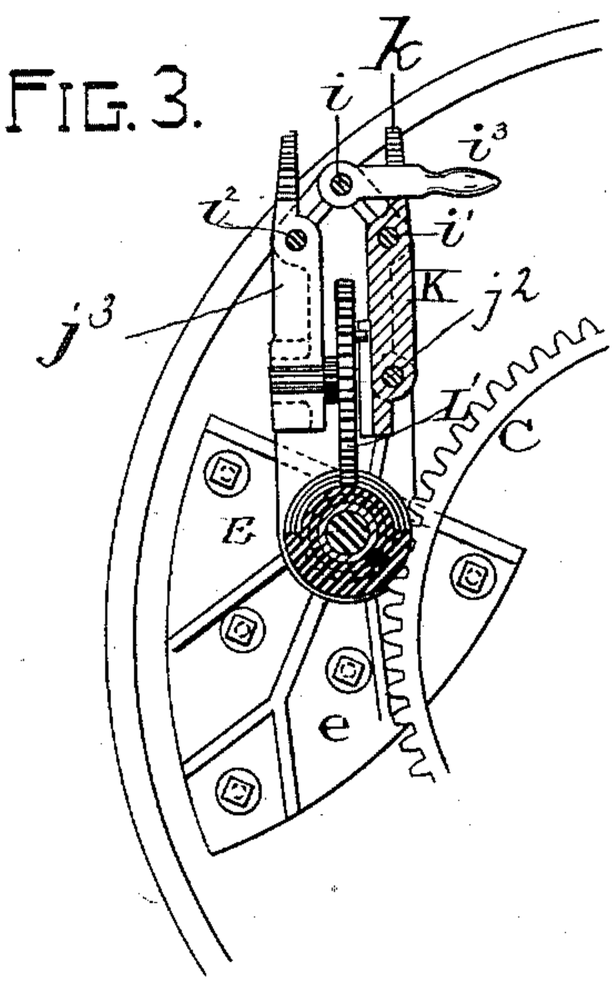
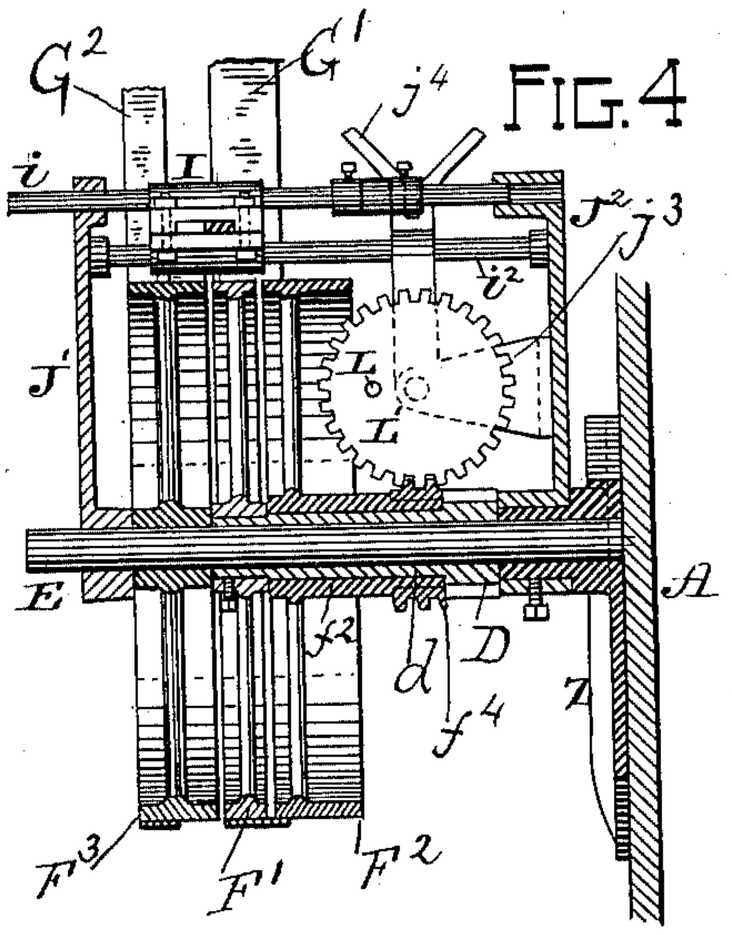


FIG. 4



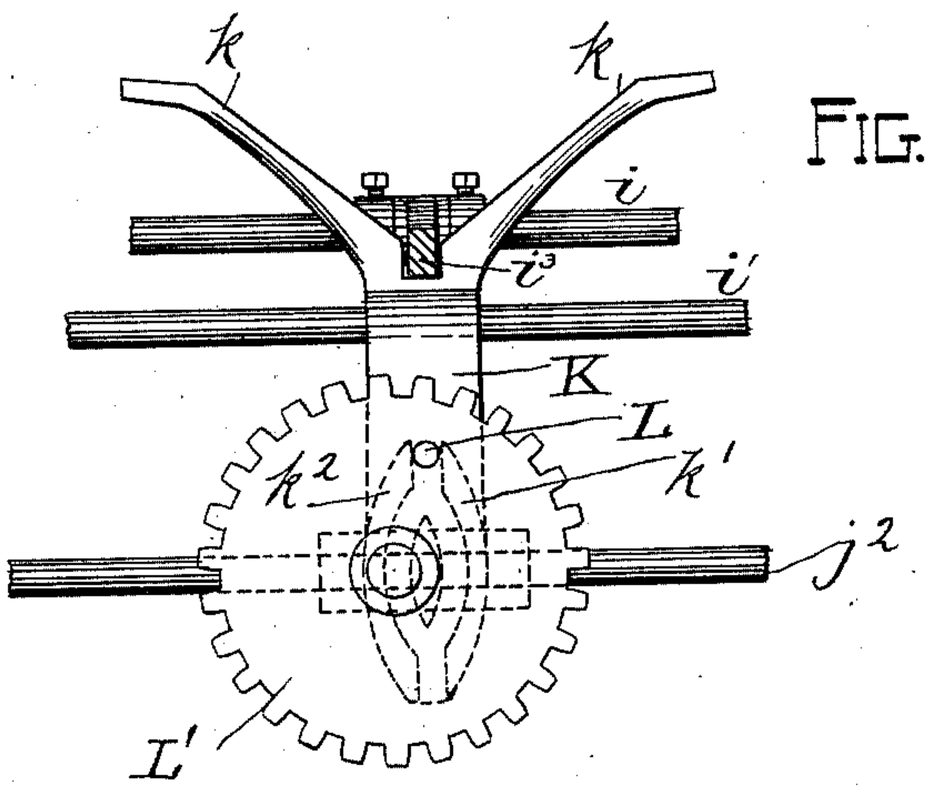


FIG. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH H. THERIEN, OF SAN FRANCISCO, CALIFORNIA.

REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 592,483, dated October 26, 1897.

Application filed October 26, 1896. Serial No. 610,144. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. THERIEN, a citizen of the United States, and a resident of the city and county of San Francisco, in the State of California, have invented a certain new and useful Improvement in Reversing-Gear, of which the following is a specification.

This invention relates to gearing employed on washing-machines of the cylinder class and which it is desired to turn alternately in opposite directions.

The object of my said improvement is to provide a simpler, stronger, more durable, and more economical gearing of the kind above mentioned than has hitherto been offered to the public.

Referring to the drawings hereto annexed, which form part of the present specification, Figure 1 is an end elevation showing my improved gearing in position on a washing-machine of the class aforesaid. Fig. 2 is a plan of said gearing. Fig. 3 is a broken sectional elevation of the same. Fig. 4 is a central longitudinal section, and Fig. 5 is a detailed view of a traveler and shifting mechanism forming part of the gearing.

A represents one end of a tub or outer shell of a washing-machine provided with an inner rotary drum or cylinder. (Not shown.)

B is one of the axles or shafts of said inner cylinder, which shaft B projects outwardly from the end of the tub A and is the means by which the cylinder therein is rotated. This axle or shaft is turned alternately in opposite directions by the gearing hereinafter described.

C is a gear-wheel rigidly secured to the axle B. With this wheel meshes a pinion D, loosely mounted upon a stationary shaft E, socketed in a plate *e*, fastened at a suitable place on the end of the tub A, and having a straight top or upper edge that coincides with the radius of the machine and curved edges that correspond with the machine's outline. The pinion D has a sleeve *d*, extending outwardly on the shaft E and carrying at its outer end a tight pulley F′, secured to it by a set-screw F, or other suitable means, so the same will revolve together. It is this tight pulley F′ which drives the axle of the washing cylinder or drum through the pinion D and gear-wheel C.

The tight pulley F′ receives its motion alternately from two belts G′ G², that run in opposite directions and one of which is a little wider than the other. The wider belt G′ is passed around another pulley F², from which it never slips away entirely, though it may move by turns over the pulley F′ and cause it to revolve. The narrower belt G² is passed around still another pulley F³, and is arranged to move to and from the latter over the tight pulley F′, to make it run in a direction opposite to that which it runs when touched by the other belt. The three said pulleys, it will be understood, are concentrical and of same diameter.

The pulley F² has a large hub f^2, adapting it to be slipped and revolve upon the sleeve *d* of the pinion D. The pulley F³ is loosely fitted on the outer end of the stationary shaft E. The two belts G′ G² are shifted, so as to alternately cover the central pulley F′, through the agency of bars H′ H², fixed in a carriage I, mounted upon a sliding rod *i*, fitted in suitable sockets in the upper end of standards J′ J², one of which is carried by the outer end of the stationary shaft E and the other by the plate *e*, that holds the inner end of said shaft. The bars H′ H² each have an open loop h' h^2, adapted to embrace the belt controlled by each of said bars, respectively. The carriage I moves back and forth with the sliding rod *i*, and is guided in its movements by two lower fixed rods i' i^2, secured to the standards J′ J² and running parallel therebetween.

The carriage I and bars carried thereby are caused to move back and forth to shift the belts, as aforesaid, by means of a traveler K, having outwardly-extending branches or horns *k k*, between which may be inserted a lever or handle i^3, that is pivotally connected with the sliding rod *i*. This traveler consists of a cast-iron piece, block, or plate carried by and arranged to slide along the rod *i* aforementioned, and a similar but shorter rod j^2, projected from the standard J². It is thus slid along the said two rods i' and j^2, through the medium of wrist-pin L, located on a worm-wheel L′, mounted on a bracket j^3, and driven by a worm f^4, secured to or formed upon the inwardly-projecting hub f^2 of the pulley F². As the belt G′ is always in contact with or never entirely off the pulley F², as herein-above stated, it would seem to follow that

when said belt is running the pulley F^2 and the worm and wheel connected therewith are also running and the traveler must move constantly upon its supporting-rods i' and j^2; but the connection between the wrist-pin of the worm-wheel L′ and the traveler K is such, however, that the latter will move only during every other quarter-revolution of the former, or thereabout. This is accomplished by causing the wrist-pin L to move within an ellipse composed of oppositely-curved ribs k' k^2, formed on the inner face of the traveler K, and having their opposite ends cut away on straight parallel lines running in the direction of the longer diameter of the said ellipse. When, therefore, the wrist-pin is in the position illustrated at Fig. 5—that is, lodged between the cut upper ends of the ribs k' k^2—it will cause the said ribs, and with them the traveler, to move sidewise for about one-quarter revolution of the worm-wheel, or until it falls within one curve of the ellipse, which it will follow during the next quarter-revolution, the traveler in the meanwhile remaining idle. When subsequently the wrist-pin will get in between the lower ends of the ribs k' k^2, it will again push on them and force the traveler to slide once more, but in an opposite direction, for about another quarter-revolution, or until it strikes the other curve of the ellipse, when for the last quarter-revolution the traveler will again come to a stop. It will now be understood that as the sliding rod i and carriage I move together with the traveler K—that is to say, provided the lever i^3 be inserted between the branches or horns k k—the bars H′ H^2 will be shifting either belt on the central pulley, according to whichever way the traveler is moved, and that while the traveler and parts moving therewith are temporarily stopped the said central pulley will be revolved by the belt that may have been shifted onto it and run accordingly—that is, alternately in opposite directions as the belts themselves move—and so will the axle or shaft B of the washing cylinder or drum be turned alternately in opposite directions through the said central pulley and intermediate connections, going a few turns one way and then a few turns the opposite way, or as long in any one direction, whether one, two, or more turns, as will be the stoppage of the traveler and belt-shifting mechanism. The bracket j^3, aforementioned, is bolted to the standard J^2, and, like the traveler K, terminates in two upwardly and outwardly extending branches or horns j^4, adapted also to receive between them the pivoted lever i^3 of the sliding rod i. Throwing back the lever i^3 between the horns or branches j^4 of the bracket j^3 disconnects the sliding rod and carriage from the traveler, and consequently the belt-shifters, and operates to stop the machine. Throwing it forward between the horns or branches k k of the traveler, as above explained, causes the sliding rod and parts thereto connected to move again and the machine to resume its work.

The lever i^3, it will be observed, is arranged so as to revolve freely about the sliding rod i, but cannot slide on it, being confined between suitable collars, as shown.

The branches or horns j^4 and k stand each at an angle of about forty-five degrees from their central support, and as the traveler covers a space only a little over three inches in its movements to and fro the lever i^3 will always fall between either pair of said branches or horns, whichever way it is thrown, regardless of the position of the sliding rod and traveler.

The standards and gearing comprised therein can be adjusted to any desired incline to suit the position of the shafting from which power is derived to run the machine.

What I claim is—

1. A stationary shaft, a pinion placed thereon, and having a sleeve made integral therewith; and a tight pulley mounted upon said sleeve, combined with belts which run in opposite directions, and which are adapted to be shifted back and forth upon the pulleys; a wheel which meshes with said pinion, two loose pulleys placed upon opposite sides of the tight one, one of the loose pulleys being provided with a hub; a worm mounted upon the hub, a worm-wheel which is operated by the worm, and a belt-shifting mechanism which is operated by said worm, substantially as shown.

2. A stationary shaft, a pinion mounted thereon, and having formed integral therewith, a sleeve, a tight pulley secured to the outer end of said sleeve, and a wheel which meshes with the pinion, and operates the washing-drum; combined with two loose pulleys placed upon opposite sides of the tight one, the inner one of the loose pulleys being provided with a hub, a worm secured to the hub, a worm-wheel which meshes with the worm and is provided with a wrist-pin; a traveler operated by the wrist-pin, two belts which run in opposite directions, and a belt-shifting mechanism which shifts the belts upon the pulleys, substantially as described.

3. A stationary shaft, a pinion placed thereon, and provided with a sleeve that is made integral therewith, a tight pulley, which is secured to the outer end of said sleeve, two loose pulleys placed upon opposite sides of the tight one, the inner one of the loose pulleys being provided with a hub, a worm secured to said hub, a worm-wheel which is operated by the worm and provided with a wrist-pin, two belts which revolve in opposite directions, a traveler placed upon a slidable support, and which is moved back and forth by the wrist-pin, upon the said worm-wheel, and a belt-shifting mechanism by means of which the belts are shifted back and forth upon the pulleys, substantially as specified.

4. In a belt-shifting mechanism, a station-

ary shaft, a pinion placed thereon and provided with a sleeve which is made integral therewith, a tight pulley secured to the outer end of the sleeve, two loose pulleys placed upon opposite sides of the tight one, two belts of different widths and which run in opposite directions, and a belt-shifting mechanism connected with the belts, combined with a worm placed upon the inner end of the hub of the inner loose pulley, a worm-wheel which is operated by this worm, and is provided with a wrist-pin, a traveler supported upon suitable rods and which is operated by the wrist-pin, a slidable rod, a lever connected thereto, and which is adapted to engage with the traveler, and which slidable rod operates the belt-shifter, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH H. THERIEN.

Witnesses:
A. H. STE. MARIE,
HENRY P. TRICOU.