

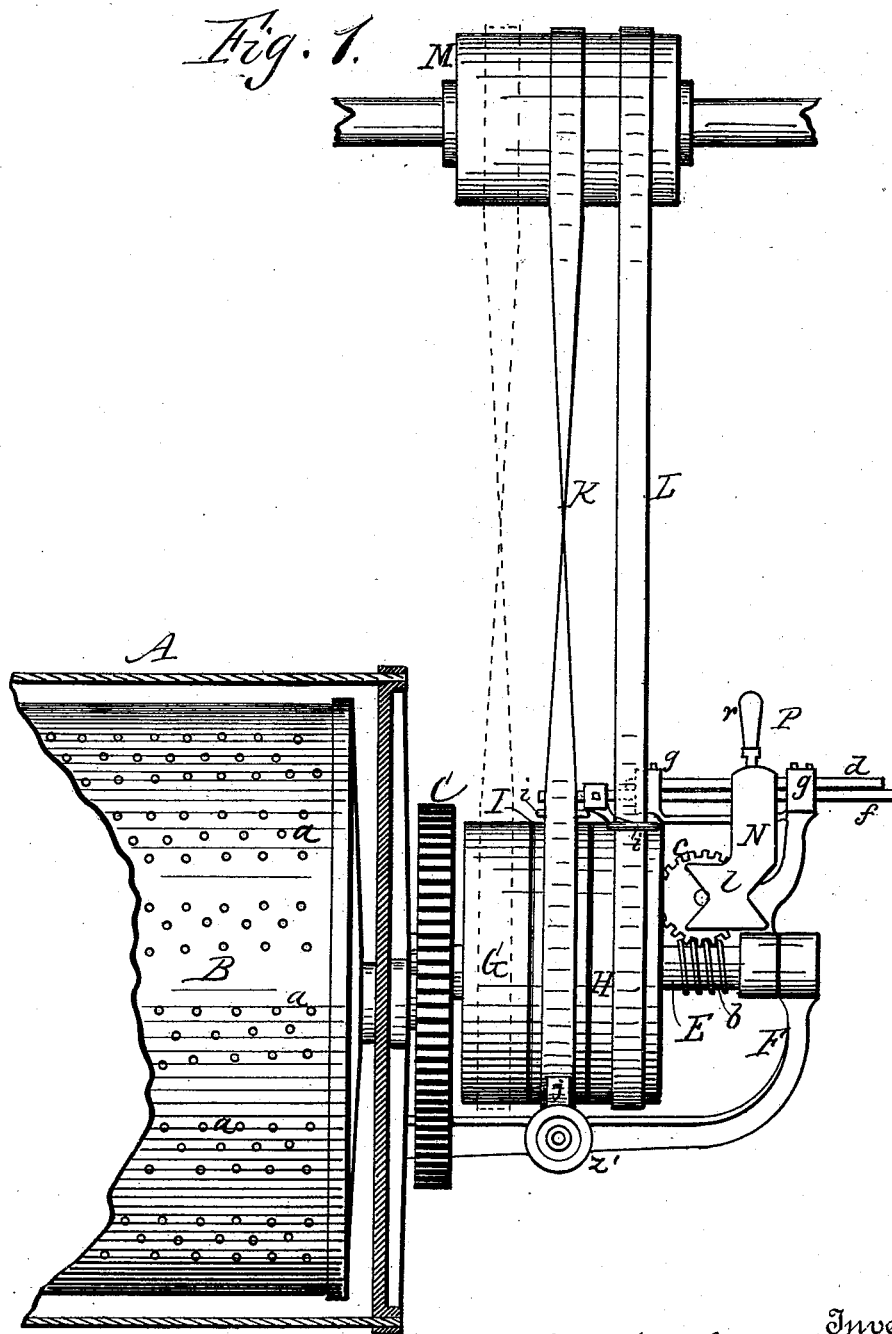
(No Model.)

3 Sheets—Sheet 1.

A. V. M. SPRAGUE.  
BELT SHIFTER.

No. 494,177.

Patented Mar. 28, 1893.



Witness  
*P. A. Heston*  
*Chas. E. Siders*

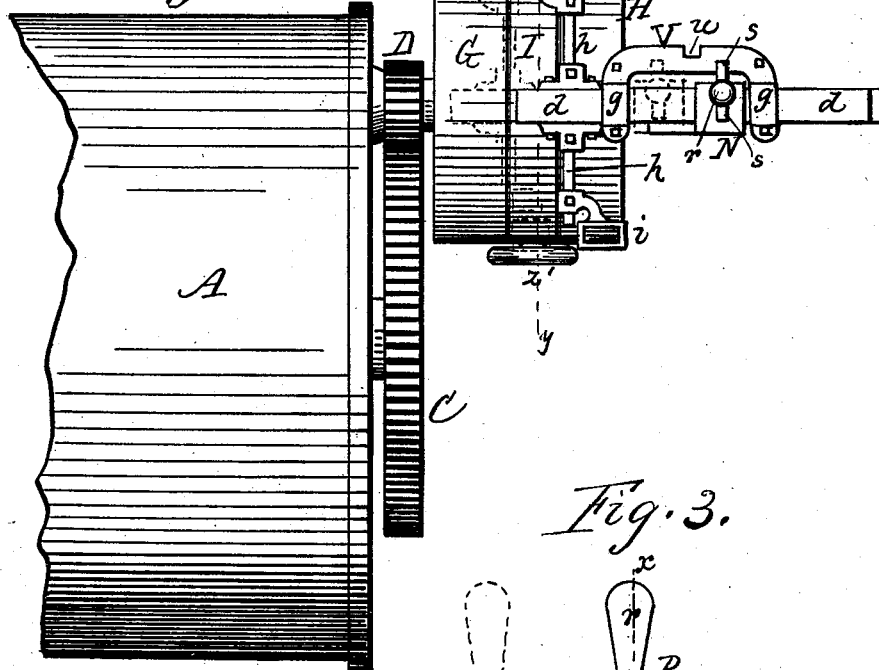
Inventor  
*Austin V. M. Sprague,*  
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A. V. M. SPRAGUE.  
BELT SHIFTER.

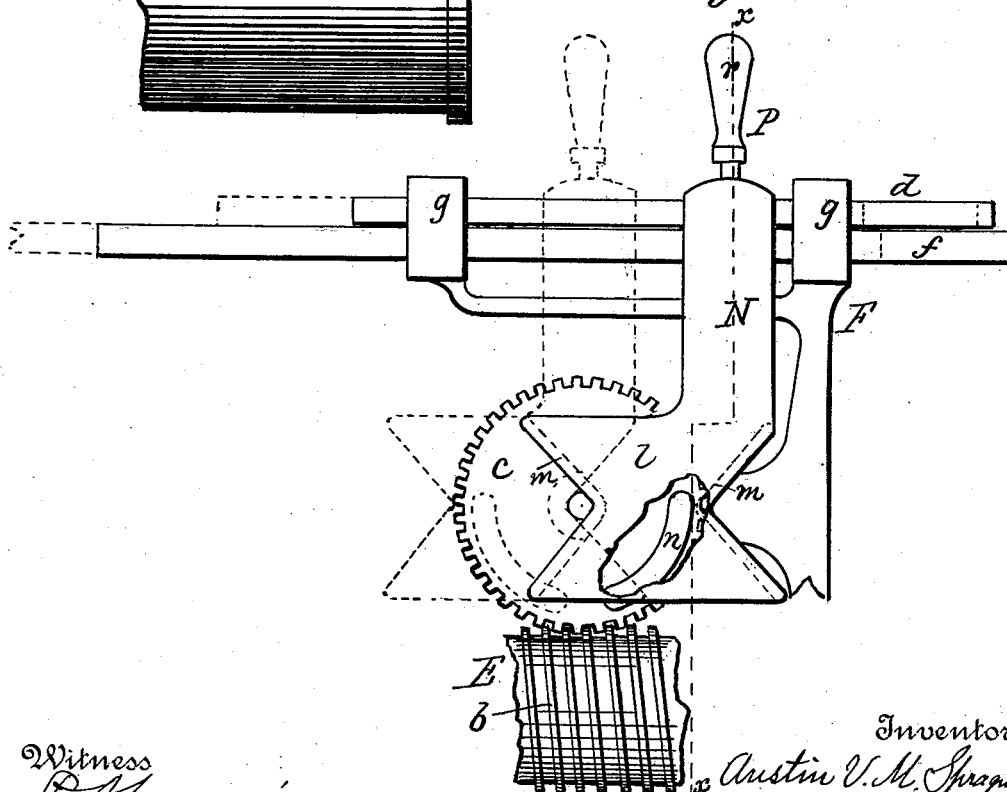
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*Fig. 2.*



*Fig. 3.*



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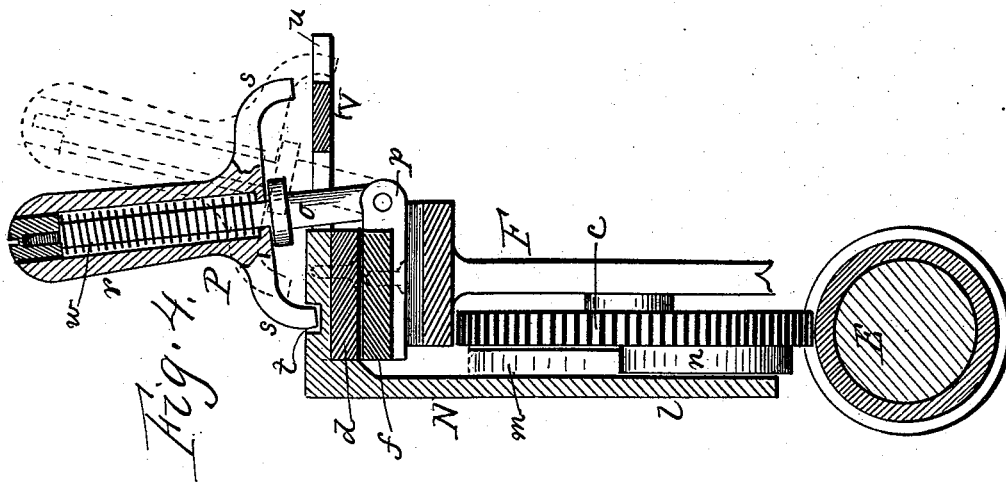
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BELT SHIFTER.

No. 494,177.

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Charles Widener.

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# UNITED STATES PATENT OFFICE.

AUSTIN V. M. SPRAGUE, OF ROCHESTER, NEW YORK.

## BELT-SHIFTER.

SPECIFICATION forming part of Letters Patent No. 494,177, dated March 28, 1893.

Application filed March 21, 1892. Serial No. 425,712. (No model.)

### *To all whom it may concern:*

Be it known that I, AUSTIN V. M. SPRAGUE, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Belt-Shifting Devices for Laundry Washing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

My improvement relates to machines with two cylinders—the outer one stationary and the inner one movable, the clothes being placed in the latter and rotated forward and back. Such machines are well known.

My invention consists in special means for giving alternate reciprocating motion to the inner cylinder, as hereinafter fully described and claimed.

In the drawings—Figure 1 is a sectional side elevation of my improvement. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged front elevation of the shifting apparatus. Fig. 4 is an enlarged vertical, cross section of the shifting apparatus, in line *xx* of Fig. 3.

A indicates the exterior and B the interior cylinder. These are of usual form. The exterior cylinder is stationary and water tight. The interior cylinder rotates on its axis, and is provided with numerous perforations *aa* through which the water can circulate. These holes are preferably struck up from the inner side, being thereby convex, by which means they prevent injury to the clothes. Both cylinders are provided with suitable doors or covers by which means the clothes can be readily inserted and removed.

My improvement is as follows:

C is a gear attached to the shaft of the interior cylinder, said shaft extending through the end of the exterior cylinder.

D is a pinion engaging with the gear and giving motion to the same, said pinion being attached to a shaft E, having its bearings in a yoke or frame F, permanently attached to the end of the exterior cylinder.

G H and I are three band wheels connected with the shaft E. The two outside ones, G H, turn loosely on the shaft and form idlers, while the center one, I, is made fast to the shaft and forms the working wheel. K and

L are two bands or belts connecting these band wheels with a single one, M, on a counter-shaft overhead. One of these bands, K, is crossed, and the other one, L, is straight, as shown.

b is a worm on the shaft E, and c is a gear wheel engaging therewith, said gear wheel having its bearing in the frame F.

d and f are two bars resting one on top of the other and forming slides. Said slides rest in bearings *g g*, and each has an independent end motion of its own. The lower slide carries at its inner end a cross head *h*, and the latter has at its ends loops *ii*, through which run the bands K L before described. The cross head *h* is adjustable endwise in its bearings on the slide, and the loops *ii* are adjustable out and in on the cross head, so that the bands can be adjusted to run properly on the band wheels.

N is a cam block attached fast to the upper slide *d*, and projecting down past the gear wheel *c*, where it is expanded to form a head *l*. On the inner side of this head are two V shaped flanges *m m* the apexes being placed toward each other, as indicated by the dotted lines in Fig. 3. On the outer face of the gear wheel *c* is a segmental cam *n*, which rests between the V shaped flanges *m m* and strikes them alternately as the gear wheel revolves, thus giving reciprocating motion to the cam block N.

P is a clutch, consisting of a shank *o*, (Fig. 4,) pivoted to a bearing *p* of the lower slide *f*; and a handle *r*, movable up and down on the shank and provided with two curved arms *ss* at the bottom. One of these arms engages with a socket *t* in the top of the cam block N when the handle is thrown forward, and the other engages with a notch *u* of the gage plate V when the handle is thrown backward. These two positions are indicated by the full and dotted lines in the cross section Fig. 4. A coiled spring *w* inside the handle tends to throw the handle down into engagement, but allows the handle to be raised to disengage the parts when desired.

In operating the machine it is designed to give alternate reciprocating rotations to the inner cylinder, and to maintain each rotation in one direction a given length of time before the change is made. This is accomplished

by the use of the cam block N and segmental cam *n*. At each revolution of the wheel *c* said cam strikes the flange *m* on one side of the head *l* and forces said head outward, and then remains in contact with the inner end of the flange till the cam has passed; during which time the inner cylinder has made several revolutions. As soon as the cam passes the flange *m* on that side its forward end strikes the opposite flange and shifts the cam block N in the opposite direction, when a certain number of rotations are given to the inner cylinder in the reverse direction. This action is produced by the shifting of the bands K L alternately from the fixed to the loose pulleys G H I. It will be seen that as the cam block N is connected to the upper slide *d*, and the latter is connected to the lower slide *f* by means of a clutch P, as before described, and the band shifting devices *h i* are attached to this slide, the bands are alternately thrown from the fast pulley to the loose ones, and as the bands are one crossed and the other straight, alternate reverse motions are given to the fast pulley. Whenever it is desired to stop the rotations of the interior cylinder, it is only necessary to throw the clutch P, from the position shown in full lines to that shown in dotted lines Fig. 4, which locks the lower slide in place and allows the upper slide to play free. This is done without stopping the machine.

Having described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. In combination, the driving shaft provided with a worm and with the loose and fixed pulleys, the belts, belt shifter comprising two V-shaped portions adapted to be alternately pressed by a cam *n* fixed on the gear wheel, said cam and wheel, the cam being in the form of an arc of a circle and arranged to positively hold the belt shifter approximately at all times by the medium of one or the other of the V-shaped portions or flanges; substantially as set forth.

2. The combination of the main shaft provided with fast and loose pulleys, the driving belts, a slide carrying belt guides, a slide carrying a block provided with cam bearings, an arc shaped cam operated mediately by the shaft to move the block and the last named slide, and a clutch P pivotally supported on said slide and adapted to be put in engagement with either the cam block or with a part of the machine frame, whereby the slides may be locked together or the lower or belt-moving slide may be locked to the frame; substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

A. V. M. SPRAGUE.

Witnesses:

R. F. OSGOOD,  
P. A. COSTICK.