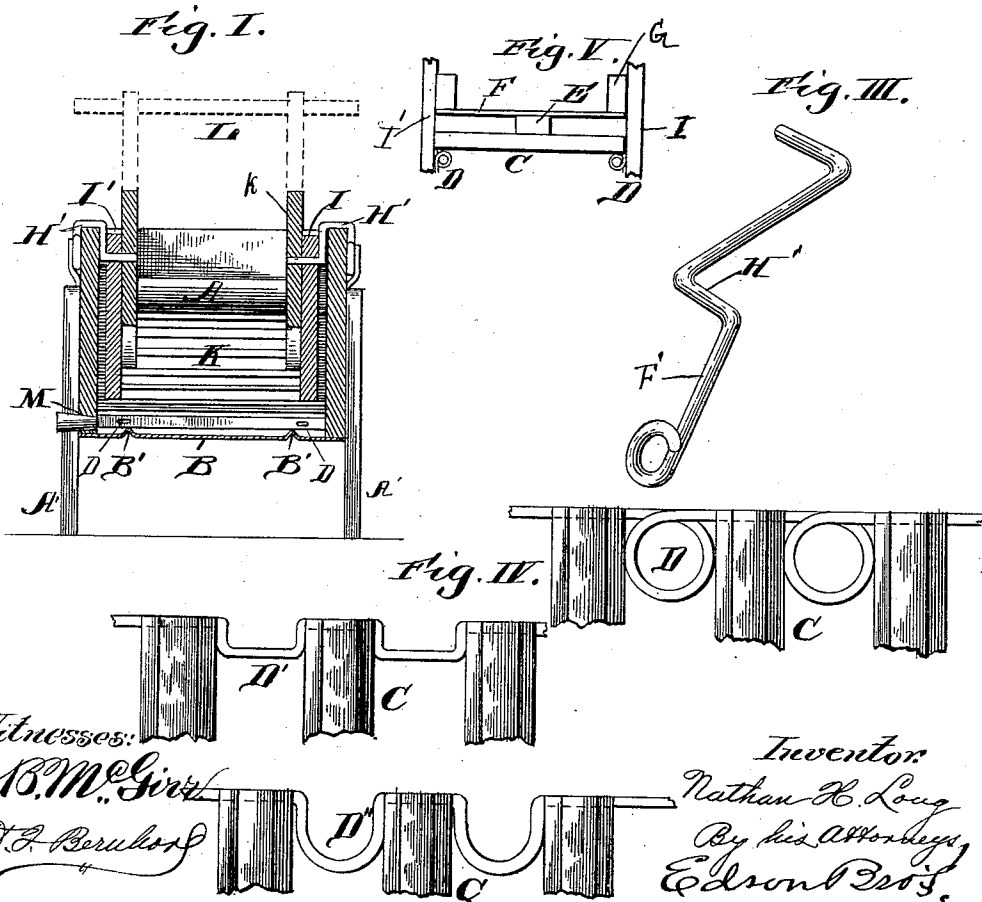
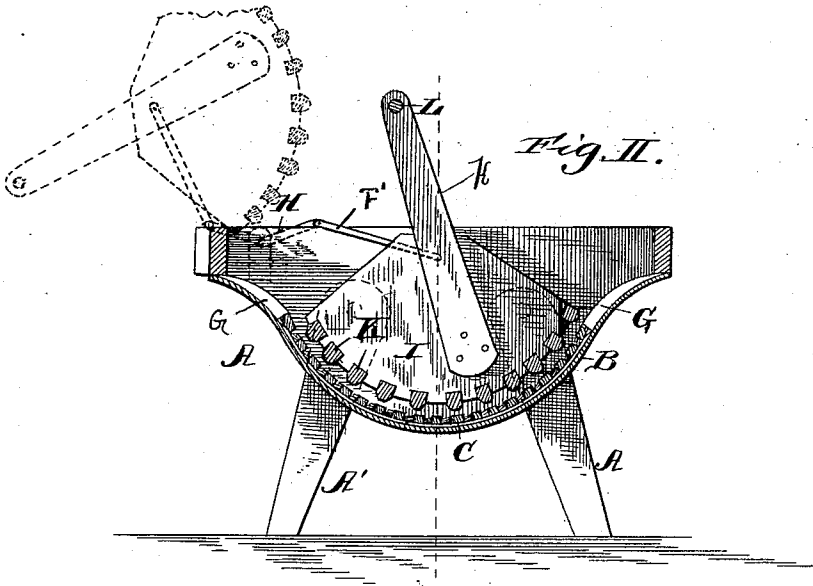


(No Model.)

N. H. LONG.  
WASHING MACHINE.

No. 486,721.

Patented Nov. 22, 1892.



# UNITED STATES PATENT OFFICE.

NATHAN H. LONG, OF MUNCIE, INDIANA.

## WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,721, dated November 22, 1892.

Application filed March 11, 1891. Serial No. 384,616. (No model.)

*To all whom it may concern:*

Be it known that I, NATHAN H. LONG, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Washing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in washing-machines of the class which employ a reciprocating rubber; and the object of the invention is to provide a simple, cheap, durable, and effective machine for expeditiously and easily washing clothes.

With these and other ends in view my invention consists in the combination, with a suds-box, of a removable rubbing-bed held in position within the suds-box by elasticity or spring-pressure, means for keeping the removable rubbing-bed a short distance above the bottom of the suds-box, and supporting-arms secured to the side of the suds-box and serving as pivots on which a hand-operated rubber is adapted to turn.

My invention further consists in the peculiar manner of connecting the bars forming the removable rubbing-bed.

My invention also consists in the peculiar construction and combination of parts, as will be hereinafter more fully described and claimed.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a transverse sectional view through a washing-machine embodying my improvements. Fig. II is a longitudinal sectional view of the same. Fig. III is a detail view of one of the supporting-arms, and Fig. IV is a detail view of modified forms of the rods used to connect the bars of the removable bed. Fig. V is a detail view illustrating the manner of securing the removable bed in the suds-box.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates the suds-box of my machine, which is supported on suitable legs A', and it

has the bottom B, which is preferably made of metal and is curved in the direction of its length. The bottom B is provided on its inner surface with two parallel ridges B', formed by striking up the metal, and on which the removable bed C rests, a space or chamber being thus formed between the bottom and the bed C for the reception of water.

The removable bed C consists of a series of parallel slats connected together by continuous rods of wire or suitable spring metal D, which are secured at the ends to the slats at the ends of the bed and are bent to form a loop, bend, or coil between said end slat and the adjoining slat and are then passed through grooves or recesses *c* cut in the ends of said second slat and secured therein by a staple or other suitable means. A loop or bend is then formed in the rods D between the second and third slats, and then passed through similar grooves or recesses in the ends of the third slat, and so on throughout the series of slats to the slat at the other end of the bed, where the ends of the rods D are secured. The bends or loops in said rods are of such size as to keep all of the slats C a certain predetermined distance apart, and thereby provide a flexible bed which will conform to the curvature of the bottom of the suds-box.

To the outer slat on either end of the bed C is centrally located a block E, and to these bars are attached elastic bars F, the ends of which are free and capable of yielding or bending slightly. When the bed C is in position in the suds-box A, the ends of the bars F bear against the lower sides of cleats G, secured to the sides of the suds-box, and which serve to prevent longitudinal movement of the bed in said box, although each individual slat of such bed may move slightly, owing to the elasticity of the bends or coils in the connecting-rods D between the slats.

Secured to the outer sides of the suds-box A, near one end thereof by means of pivots H are attached supporting-arms F'. These arms are provided at an intermediate point of their length, as at H', with a right-angled bend, and this bent portion of the rods F' rests on the upper edges of the sides of the box A when the machine is in use. The rods F' then extend along the inner walls of the box A, and

near their inner ends are bent to form pivots for the rubber I of the machine. The rubber is composed of the parallel curved side pieces *l*, which are united by a series of slats *K*, and to the side pieces are connected uprights *k*, which are connected near their upper ends by a cross-bar *L*.

*M* designates an opening in one of the side walls of the box *A* near the bottom, through which the water in said box can escape, said opening being closed by a suitable plug when the machine is being used.

In Fig. IV I have illustrated different ways in which the rods used to connect the slats of the removable bed *C* may be bent. In this figure the rods are shown bent in a circular form at *D*, into a square or angular form at *D'*, and into a U-shaped form at *D''*.

The operation of my invention may be briefly stated thus: The bed *C* is placed in position in the box *A* and holds itself firmly in place therein by contact with the cleats *G*. The bed rests on the parallel ridges *B*, formed in the base of the box *A*, thus leaving a space for the water. The box *A* is partially filled with water and the clothes are placed on the bed *C*. The rubber *I* is reciprocated on its pivots by grasping and swinging the cross-bar *L*, and as the clothes are between the bed *C* and the parallel bars *K* of the rubber they are quickly and thoroughly cleaned. The right-angled supporting-arms rest on the top of the edges of the box *A* and prevent the rubber *I* from descending below the operative position. When the washing is completed, the rubber is elevated above the box *A* by turning the supporting-arms on their pivots, and the clothes can then be readily removed. The right-angled bends in the supporting-arms *F* are formed at such distance from the pivot-points of said arms that when the rubber is elevated and the operating-handle depressed the bends in the arms rest upon the upper edges of the box and hold the rubber within the same. Thus there is no danger of the floor surrounding the machine becoming wet from water dripping from the rubber, as the latter is within the sides of the box when elevated to permit ready access to the fabrics in the suds-box for the purpose of removing them.

I am aware that changes in the form and proportion of parts and details of construc-

tion can be made without departing from the spirit or sacrificing the advantages of any improvements, and therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a washing-machine, the combination of a box, a flexible removable bed fitted in said box and provided at its ends with a spring-bar, cleats secured to the inner walls of the box and bearing against the spring-bars on the removable bed, and a reciprocating rubber supported in said box above the removable bed, substantially as shown and described.

2. In a washing-machine, the combination, with a suds-box, of supporting-arms pivotally connected to the sides thereof and a reciprocating rubber pivoted to the inner ends of the supporting-arms, said arms being pivotally connected to the outer sides of the suds-box and having the intermediate angular portions which extend across the edges of the suds-box, the distance from such angular portions to the pivotal points of the rubber being less than the distance from such pivotal points to the end of the rubber, whereby when the rubber is elevated it contacts with the end of the suds-box and is held in an elevated position just within the vertical sides of such box and the supporting-arms bear upon the edges of the suds-box, substantially as shown and described.

3. In a washing-machine, a resilient or spring-yielding bed, substantially as described, comprising a series of parallel slats having the transverse grooves in the ends thereof, the two connecting-rods fastened at their ends to the end slats of the bed and passing continuously through the grooves in the ends of the intermediate slats, said connecting-rods being bent at points between adjacent slats and bearing against the contiguous faces of said slats, as and for the purpose described.

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

NATHAN H. LONG.

Witnesses:

N. N. SPENCE,  
G. L. CAREY.