W. H. BEHRENS.

MACHINES FOR HARDENING AND SIZING HAT BODIES.

No. 195,476. Patented Sept. 25, 1877.

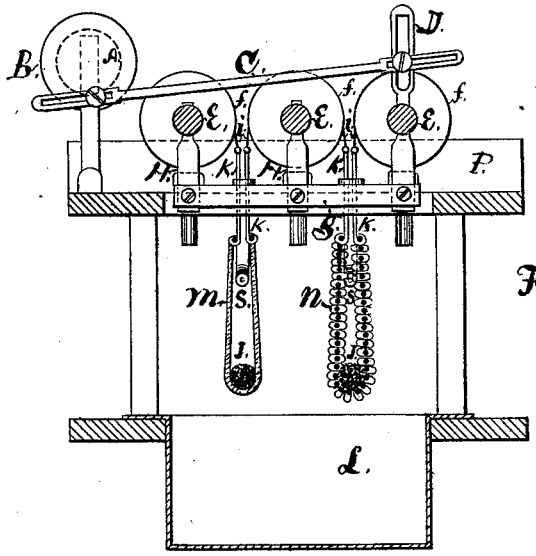


Fig. 2

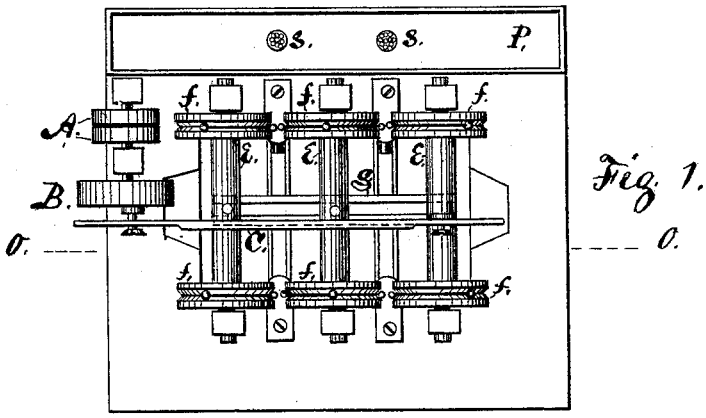
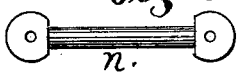


Fig. 1.

Fig. 3



Witnesses
Horace Stevens
Austin McClellan

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UNITED STATES PATENT OFFICE.

WILLIAM H. BEHRENS, OF ORANGE, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR HARDENING AND SIZING HAT-BODIES.

Specification forming part of Letters Patent No. **195,476**, dated September 25, 1877; application filed August 17, 1877.

To all whom it may concern:

Be it known that I, WILLIAM HENRY BEHRENS, of Orange, in the county of Essex and State of New Jersey, have invented a Hat-Hardening and Hat-Sizing Machine, of which the following is a specification:

My invention consists in an automatic machine for hardening and sizing hat-bodies, employing certain reciprocating bars, levers, pulleys, and elastic beds, &c., in the place of hand labor.

Figure 1 is a plan view. Fig. 2 is a longitudinal cross-section taken from the points *o o*. Fig. 3 shows one of the elastic strips employed in making the bed for sizing.

In operating the machine the power is applied to the pulley A, which communicates motion to the crank-wheel B. Connected with this crank-pin, by a slot, is a bar, C, and this bar, slotted also at the opposite end, is connected to a lever, D, which passes through one of the shafts E, on which, at each end, are secured the grooved pulleys *f*. This lever, below the shaft through which it passes, is connected to a single or double bar, *g*. To this bar, also, are connected levers H H, which pass up and are secured each in the shaft above it.

The motion of the crank gives a reciprocal action to the bars *c* and *g* and to the pulleys *f*. In the groove of each pulley is attached a cord, *i*, or belt, which passes down on the inside and connects with a rod, *k;* and at the lower end of these rods—the two that come near together—is attached, by an adjustable hook, the two ends of an elastic bed, *m* or *n*. These beds are to receive a roll of the hats J, and are made in two forms. That represented by *m* is made of elastic webbing or some equivalent material, and is used for hardening the hat before it is sized. The alternate motion on each rod rolls the hats in the bed, and accomplishes what is known as the process of "hardening."

When this process is completed and the hats are taken out, this bed is readily removed, and the bed represented by *n* is supplied in the same place, into which the hats are put for sizing.

The sizing matter, in liquid, is contained in the reservoir L, and is pumped up for use into the vat P, and from thence, by the pipes S, is conveyed to the inside of the beds, and, by perforations in the pipes, it is sprinkled on the hats while they are being tumbled in the beds *n* by the reciprocal motion; and these beds, made of elastic strips held together at the ends, allow the drippings from the hats to drop down again into the reservoir. These beds are made elastic, to accommodate a larger or smaller bundle of hats to be worked at the same time; but it is not absolute that they be made elastic.

The bars may be lengthened, and as many beds be connected in one machine as is desired, all operated by the same automatic action.

Instead of the slots in the bar C, different holes may be made to regulate the motion of the beds. It is merely a mechanical difference. Therefore

I claim—

1. In a hat hardening and sizing machine, the crank B, bars C and *g*, levers H H and D, pulleys *f*, cords *i*, rods *k*, and beds *m* and *n*, constructed and combined substantially as and for the purposes specified.

2. The adjustable reciprocating beds *m* and *n*, used alternately for hardening and sizing, in combination with the rods *k*, cords *i*, and pulleys *f*, substantially as specified.

WILLIAM H. BEHRENS.

Witnesses:
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AUSTIN MCCLELLAN.