

(No Model.)

G. YULE.
Felting Machine.

No. 238,071.

Patented Feb. 22, 1881.

Fig. 1.

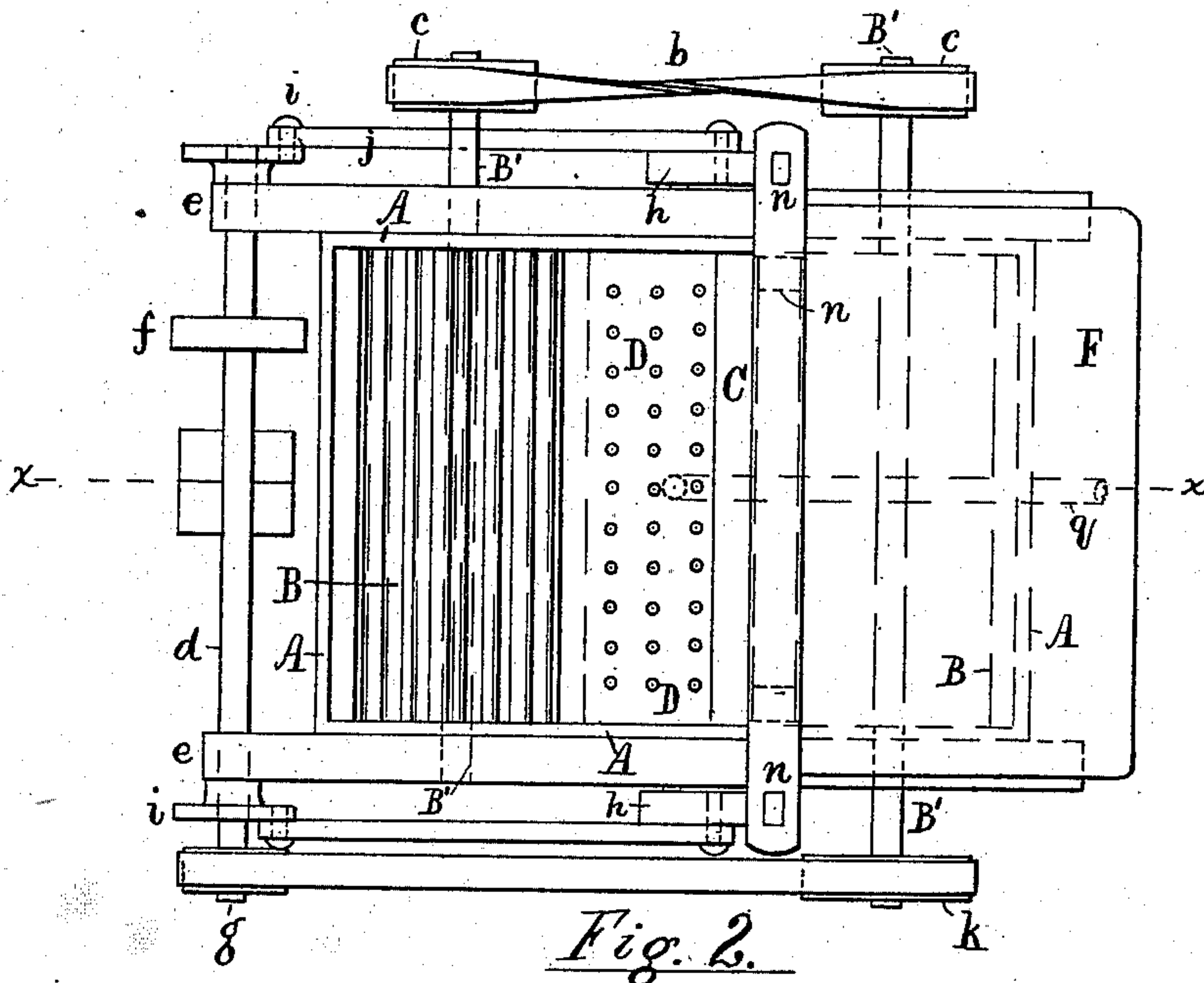
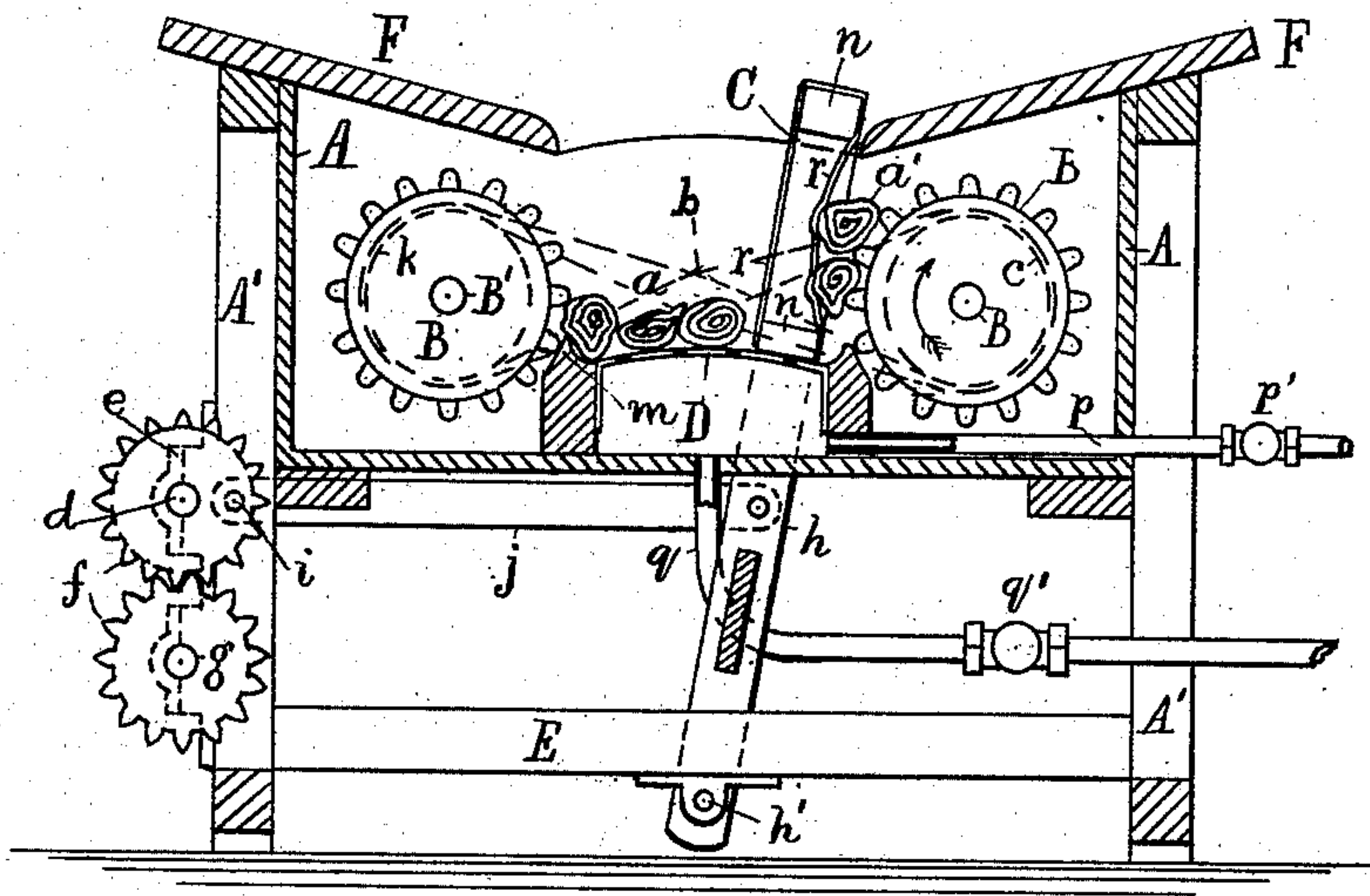


Fig. 2.

Attest:

A. W. Crane.

W. Dietz

Inventor.

George Yule, per

Thos. S. Crane, Atty.

UNITED STATES PATENT OFFICE.

GEORGE YULE, OF NEWARK, NEW JERSEY.

FELTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 238,071, dated February 22, 1881.

Application filed November 13, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE YULE, a resident of the city of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Felting-Machines, of which the following is a description.

My invention relates to an improvement in felting-machines; and it consists in the combination, with a suitable chest, of a ribbed roller arranged to form one side of the chest, a vibrating beater operating to force the felts intermittently against the roller, which is revolved to roll the felts over when pressed against it, and a steam-inlet arranged to envelop the felts in hot vapor during the felting operation.

The purpose of my invention is to subject the felts to the pressure of the ribs upon the roller while permeated by the vapor of the steam, which I have found is far more effective in the primary stages of the felting operation than hot water; and the construction I have shown and described I consider the best adapted for operating upon such felts as hat-bodies before they are ready for the final sizing-machines.

In the drawings annexed, Figure 1 is a sectional view of my improved machine on line x in Fig. 2, and the latter figure is a plan of the machine with one of the shelves removed to show the roller and perforated steam-plate.

A is the chest or box, of plain rectangular form, at each end of which I place a roller, B, (provided with ribs or otherwise roughened,) on a horizontal shaft, B', arranging the beater C to vibrate between the rollers over a perforated steam-plate, D, which forms the bottom of the space between the rollers. By this arrangement the felts shown at a lie directly over the steam-inlets in the plate D when not pressed against the rollers by the beater, and they are therefore intermittently exposed to the jets of steam and the felting pressure, while the chest is continuously filled with the hot vapor, whether covered or not. By arranging a roller at each end of the chest, the capacity of the machine is doubled without adding anything to the cost, except the roller and its driving-belt b and pulleys c . The chest is mounted upon legs A', to which a cross-shaft, d , is attached

by bearings e , in which the shaft is revolved by gears f , connecting with a driving-shaft, g . The cross-shaft is provided with a crank, i , at each end for vibrating the beater, which is mounted upon swinging arms h , pivoted at h' upon a bar, E, framed into the legs A', close to the floor. Connections j join the crank-pins i with the middle of the arms h , to the tops of which the beater is secured by a strong cross-bar. The rotation of the cross-shaft thus vibrates the beater, and the rotary motion is imparted to the ribbed rollers by the driving-shaft g , through the medium of pulleys k upon the ends of shafts g and B'. The vibrating motion being transmitted to the beater through the medium of the extended arms h , a certain degree of elasticity is possessed by the beater, and to insure sufficient compensation for the variable mass operated upon I also make the face of the beater of a yielding substance.

In the drawings I have shown the beater formed of a rectangular frame of bars, n , the top one being united, by its ends, to the arms h , and the bottom one moving in close proximity to the steam-plate D, which is arched to conform to the motion of the beater. By this construction the entire beater depends from the top cross-bar and operates entirely inside the chest, thus permitting the top to be covered, when desired, by boards laid across between the shelves F, (shown in Fig. 1,) placed at each end of the chest over the rollers B. Over the frame, upon each side, I secure a sheet of rubber cloth, r , which presses the felts a' sufficiently against the ribs upon the roller, while it is free to yield toward the hollow frame over which it is stretched.

The steam-plate is made of perforated metal or wood, beneath which steam is introduced by a pipe, p , a water-outlet, q , being also provided to drain out the condensed fluid. Cocks p' and q' are provided in each of these pipes, to regulate the flow of the steam and water as desired.

The rollers are preferably arranged with their bottoms a little below the level of the steam-plate, and a projecting guard, m , is desirable where the ends of the plate abut against the rollers, to prevent the crowding in of the felts. This is also prevented by rotating the rollers in the direction shown by the arrow upon the

right-hand roller in Fig. 1, so as to lift the felts up from the bottom. To turn both rollers in such a direction a cross-belt should be applied to the pulleys *c*. Over each roller is shown, in Fig. 1, the shelf *F*, upon which the felts may be rolled and prepared for the action of the machine in the usual way, the rolls being dropped into the open space formed when the beater recedes from the roller, and subjected to the pressing action of the beater as long as is desired.

The ribs upon the rollers may be replaced by knobs or equivalent projections adapted to turn over the felt-rolls when pressed against them, and the driving-gearing may also be modified in any desired manner, as the essential features of the invention are the rollers, the beater, and the steam-plate *D*, arranged, as described above, inside the chest *A*, and operating upon the felts in the manner described.

I am aware that felt has been subjected to the action of a rubber operating over a steam-plate, as in Newton's British Patent No. 2,697 of 1869; but in such patent the mechanism was only adapted to operate upon a continuous web of fabric by the simple operation of rubbing, and was unprovided with the rollers which render my device especially efficient for felting a roll like the bundle of hats shown at *a*; and I therefore consider that my invention consists in combining the rollers with the steam-plate inside a steam-chest, and in constructing and operating a beater to press the felts intermittently against the roller, which is roughened to turn the felts over when pressed against it.

I am also aware that reciprocating beaters are common in fulling-machines, and that

mechanism similar to that I have shown is common for vibrating the beater; but the arrangement of the beater with ribbed rollers in the manner described being new, I have claimed the same hereinafter used in combination with the steam-plate in the bottom of the chest or not.

As first stated the effects of the machine may all be secured by the use of one roll or drum in connection with the beater and steam-plate; and

I therefore claim the same as follows:

1. The combination, with the chest *A*, of a beater constructed and arranged, substantially as described, to press the felts intermittently, with a ribbed roller, *B*, arranged to form one side of the chest, and operated to roll the felts upward from the bottom of the chest, substantially as and for the purpose set forth.

2. The combination of the chest *A*, the roller *B*, arranged to form one side of the chest, the steam-plate *D*, arranged in the bottom of the chest, and the vibrating beater *C*, arranged and operated as and for the purpose set forth.

3. The combination of the chest *A*, having a roller, *B*, arranged inside at each end, and provided with a steam-plate, *D*, in the bottom, with a vibrating beater, *C*, pivoted beneath the chest, and provided with a yielding surface, to prevent injury to the felts, the whole operated substantially as herein set forth.

In testimony that I claim the foregoing I have hereto set my hand, this 19th day of October, 1880, in the presence of two witnesses.

GEORGE YULE.

Witnesses:

M. J. DE WITT,
T. S. CRANE.