

C. P. LADD.
Fulling-Machines.

No. 127,489.

Patented June 4, 1872.

Fig. 1.

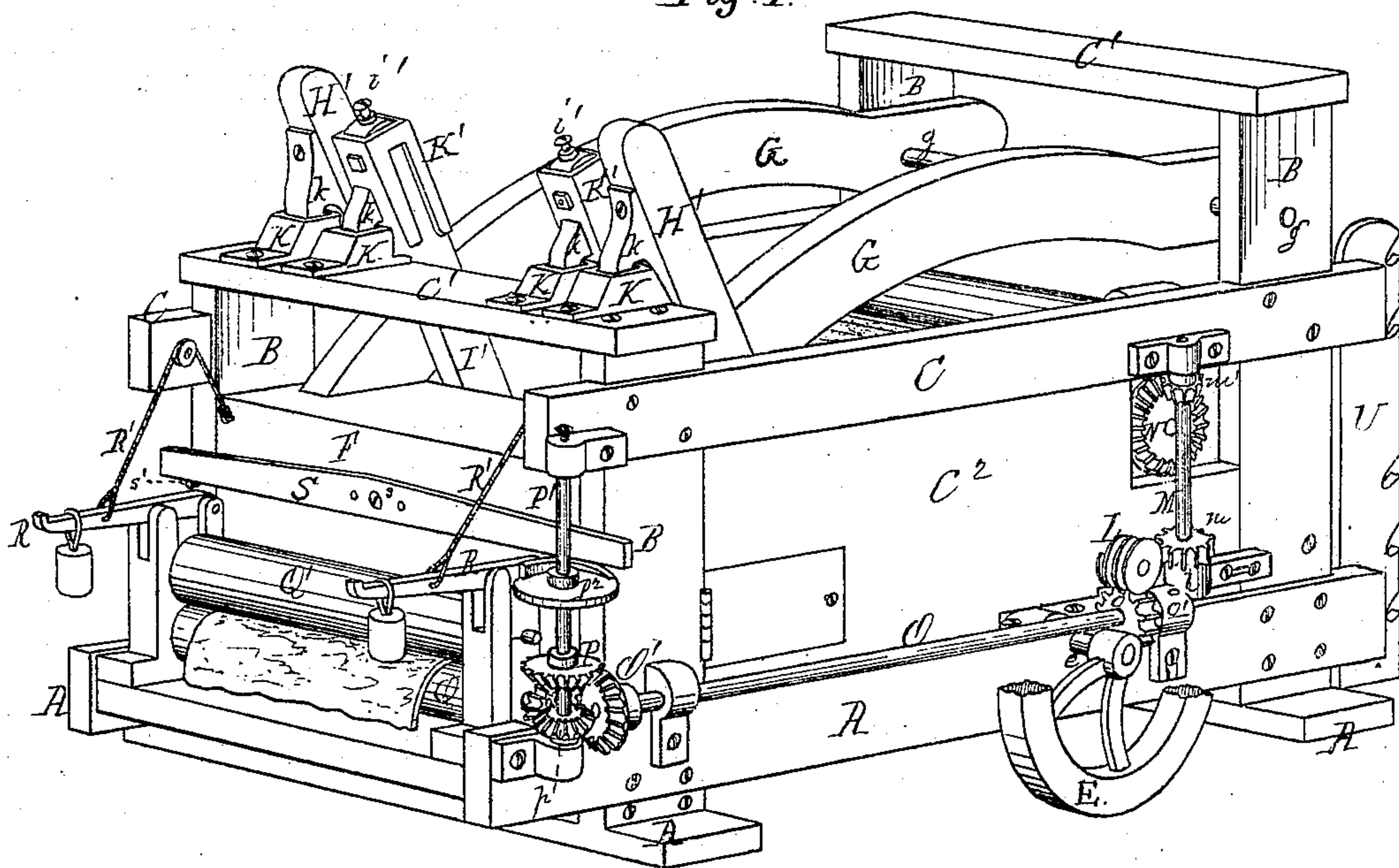
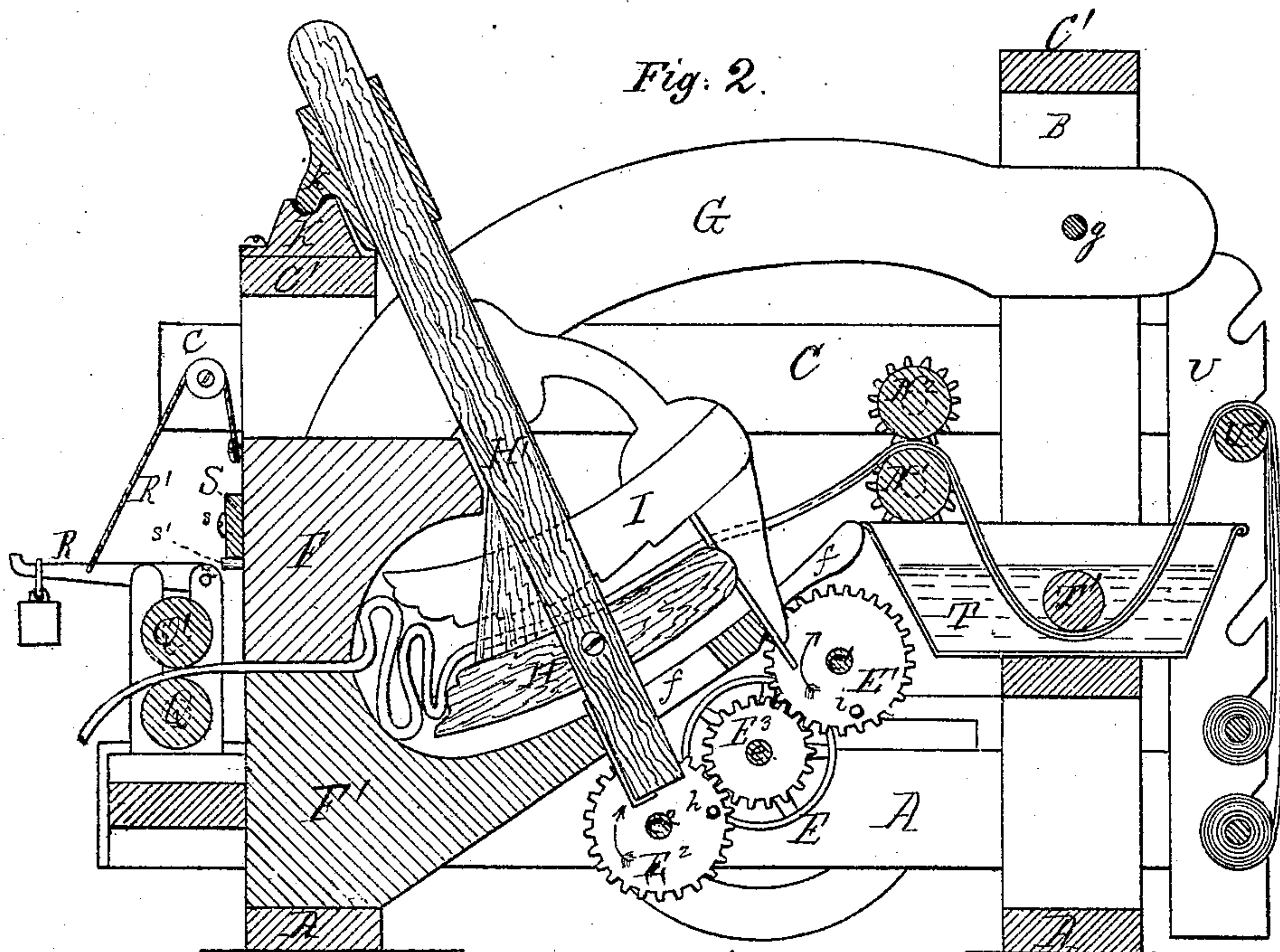


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

CALVIN P. LADD, OF BLOOMFIELD, NEW JERSEY, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JAMES T. SANFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN FULLING-MACHINES.

Specification forming part of Letters Patent No. 127,489, dated June 4, 1872.

To all whom it may concern:

Be it known that I, CALVIN P. LADD, of Bloomfield, county of Essex, State of New Jersey, have invented a new and useful Improvement in Fulling-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view, and Fig. 2 a vertical longitudinal section, of a machine embracing my improvements.

In the accompanying drawing, A A represent the sills, B the posts, C the longitudinal girts, and C¹ the transverse girts, which, together with the sides C², form the frame-work and casing, which support the working parts of the machine. Motion is imparted to the devices through a band-wheel, E, keyed to driving-shaft *e*, which is mounted in suitable bearings on one of the lower sills, A, and extends across the machine from side to side. *e*¹ *e*² are two similar shafts lying parallel with shaft *e*, but, for convenience, arranged in planes respectively above and below the plane of shaft *e*. Shafts *e*¹ *e*² are driven from shaft *e* through the gear-wheels E¹ E² E³, as is plainly shown in Fig. 2. F F' is the fulling stock or abutment, made in two parts, the lower one, F', being stationary and expanded into an apron or floor, which extends forward and upward, above the shafts *e* *e*¹ *e*², and connects with a vat. This apron is made, preferably, wide enough to fill the space between the sides C², but is recessed upon each side, as at *f*, Fig. 2, forming slots. The upper part F of the stock is made much narrower, as shown, and is attached to the free ends of arms G, which are pivoted at their front ends as at *g*. Thus the part F is free to rise and fall, when actuated by mechanism which will soon be explained. H I are two beaters or thumpers supported upon links H' I'. These links or hangers are suspended at their upper ends upon transverse girts C¹, by means of sockets K and jaws *k*, in such manner that a vibratory or oscillating movement may be imparted to them by means of pins or studs *h* *i*, which project from the faces of gear-wheels E¹ E², so that as the wheels revolve in the direction indicated by the arrow said pins shall engage with the lower ends of the links or hangers H' I' and lift them and the thump-

ers a short distance, and then escape and let them (the thumpers) fall, as will be readily understood without further explanation. These thumpers are of a length about equal to the width of the machine between the sides C², and are placed one above the other, the distance between them being regulated by set-screws *i* *i*' or their equivalents at the upper end of links I', as shown in Fig. 1, these links being supported in forked socket-pieces K' in such manner as to slide endwise therein when actuated by the set-screws, which fit threads cut in said sockets, the lower ends of the screws being connected to the ends of the links and moving them up and down, as will be readily understood without further explanation. The thumpers are ribbed or corrugated upon their rear edges—that is, those edges which are next to the fulling-stock—and are also ribbed upon one or both of their sides, which should be formed in an arc of a circle the center of which is the point at which the links H' I' are supported, as by means of this form they will always maintain a proper working relation to each other during their vibration. By preference I make the corrugations upon the sides of the thumpers to resemble in some degree the teeth of a ratchet, as shown in Fig. 2. The gears E¹ E² E³ are not shown in Fig. 1, because they are inclosed within the sides C²; but I do not wish to be confined to this arrangement. L is a worm or screw secured to the outer end of shaft *e*¹, and engaging with a corresponding worm-wheel, *m*, on the vertical shaft M, which carries at its upper end a bevel-pinion, *m*'. Pinion *m*' gears with bevel-wheel N on the projecting end of the shaft of one of a pair of feeding and squeezing rollers, N¹ N². Thus a slow rotary motion is imparted to these feeding-rollers. O is a horizontal shaft driven by another worm-wheel, *o*, from screw L, and provided with a bevel-gear wheel, O'. The bearings *o*' and *l*, which support one end of the shafts M O, respectively, are made adjustable in order that worm-wheels *m* *o* may be kept properly in mesh with screw L. Bevel-wheel O' gears with bevel-wheel P on the vertical shaft P¹, which has keyed to it the bevel-gear *p* and the cam P². Q Q' are feeding-rollers, located in rear of the fulling-stock or abutment F F' in such position that their engaging surfaces are about in the same horizontal

plane with the dividing-line between the two parts of said abutment, as shown in Fig. 2. The lower roller, Q, revolves in stationary bearings, but the upper one is free to rise and fall, being held down by means of the weighted levers R R. Roller Q is driven from bevel-wheel P, gearing with a bevel-pinion on one end of the roller-shaft, and roller Q' is driven from roller Q by spur-wheels on the opposite ends of the rollers. R' R' are chains passing over pulleys mounted on girts C or other suitable supports, and connecting the weighted levers R R with the upper part F of the fulling-stock. S is a lever, pivoted centrally to the rear face of the movable part F of the stock at s in such position that one end shall rest upon and be actuated by the cam P², so that when the opposite end of the lever is supported by the pin s' against downward thrust, stock F shall be lifted and dropped once at each revolution of said cam P². T is a vat for containing any of the usual saponaceous compounds or solutions usually employed to facilitate the process of fulling. T' is a guide-roller, and U is a standard, (of which there should be one at each side of the machine,) provided with brackets for the reception of the rollers upon which the felt or other goods is rolled.

The operation of my machine is substantially as follows: The rollers (one or more) carrying the goods to be treated are placed upon the standard U. One end of the piece or pieces, as the case may be, is then passed over roller U', under roller T', between the squeezing and feeding rollers N¹ N², which revolve in the direction indicated by the arrow. From these rollers the goods are passed between the beaters or thumpers H I, or they may be passed under and between, or both, as may be desired, and thence into the space at their rear ends, sometimes called the fulling-chamber, where they are subjected to substantially the ordinary fulling process for such length of time as may be thought advisable, during which time they are being slowly fed in by the rollers N¹ N². While this operation has been going on the pin s' has been withdrawn, so that the lever S has been vibrated about the pivot s without lifting the stock F. I now replace pin s', and when cam P² has been advanced a short distance beyond the position in which it is shown in Fig. 1 stock F will have been lifted such distance as will enable me to withdraw the end of the piece of cloth for examination, to see if it is fulled enough. If it is not fulled enough I put it back, and continue the operation as before; but if it is fulled sufficiently I introduce the end between rollers Q Q', which are now pressed tightly together by the weighted levers R R. The rollers will continue to draw the goods out of the fulling-chamber until lever S is released at the heel of the cam, when the stock F falls and holds the goods with a firm gripe and simultaneously lifts the weighted lever R R, thereby releasing roller Q and

checking the feed. It may be found advisable to employ springs to lift roller Q from roller Q' when it is desired to check the feed.

It will be seen by an examination of the gearing that the speed of rollers Q Q' is much greater than that of rollers N¹ N². This is required from the fact that rollers N¹ N² feed continuously, whereas rollers Q Q' intermit in their feed, although one or perhaps both of them revolve continuously; and as some goods shorten up more than others in fulling the proportionate length of time that rollers Q Q' are made to feed may be regulated by adjusting lever S longitudinally. Thus, while the cam begins to actuate the lever at the same point in its (the cam's) revolution, it is evident that if we withdraw the lever from the position relative to the cam in which it is shown in Fig. 1 it will not be held up so long as it would be if it were left where it now is, and, on the contrary, it would be held up longer by thrusting it further over the cam than is shown in Fig. 1.

No pipes are shown for heating the solution-vat, but I intend adding them; and I may increase the number of thumpers without departing from the spirit of my invention. I may also find it advantageous to corrugate the apron or bed which forms an extension of the lower stock.

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

1. In a fulling-machine, two or more vibrating thumpers or beaters, arranged in parallel or nearly-parallel planes in such manner that the goods to be operated upon may be readily passed between said thumpers into the fulling-chamber.

2. A fulling-stock made in two parts, one of which is movable to permit the withdrawal of the fulled goods.

3. In combination with the fulling-stock F F', the automatic intermitting feed-rollers or take-up Q Q', operated substantially as and for the purpose set forth.

4. In combination with the divided fulling-stock and the feeding-rollers or take-up Q Q', the levers R R, the chains R' R', or their equivalents, for causing the rollers to act upon the goods when the upper part of the fulling-stock is lifted, substantially as and for the purpose set forth.

5. In combination with the feeding or take-up rollers Q Q' and divided fulling-stock F F', the adjustable lever S and cam P² for regulating the amount of goods which shall be removed from the fulling-chamber during a given period, as at each successive interval, substantially as described.

6. In combination with the fulling devices, the vat T and the feeding and squeezing rollers N¹ N², substantially as described.

In testimony whereof I have hereunto set my hand this 12th day of January, A. D. 1872.

Witnesses: CALVIN P. LADD.

JAMES M. G. DOREMUS,
A. G. SAYRE.