

J. MOULTON.

Making Elastic Rolls and Tubes.

No. 84,208.

Patented Nov. 17, 1868.

Fig: 1.

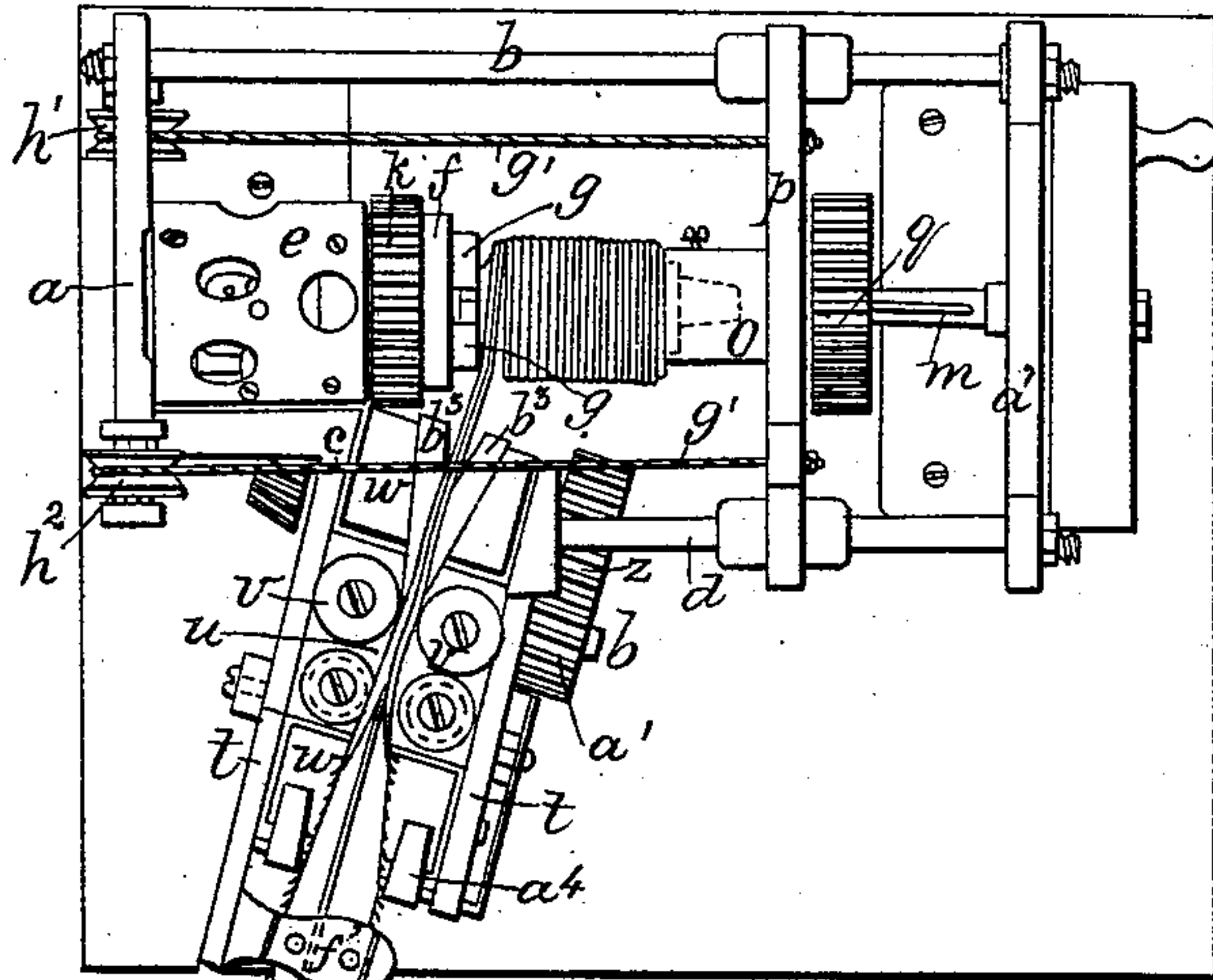
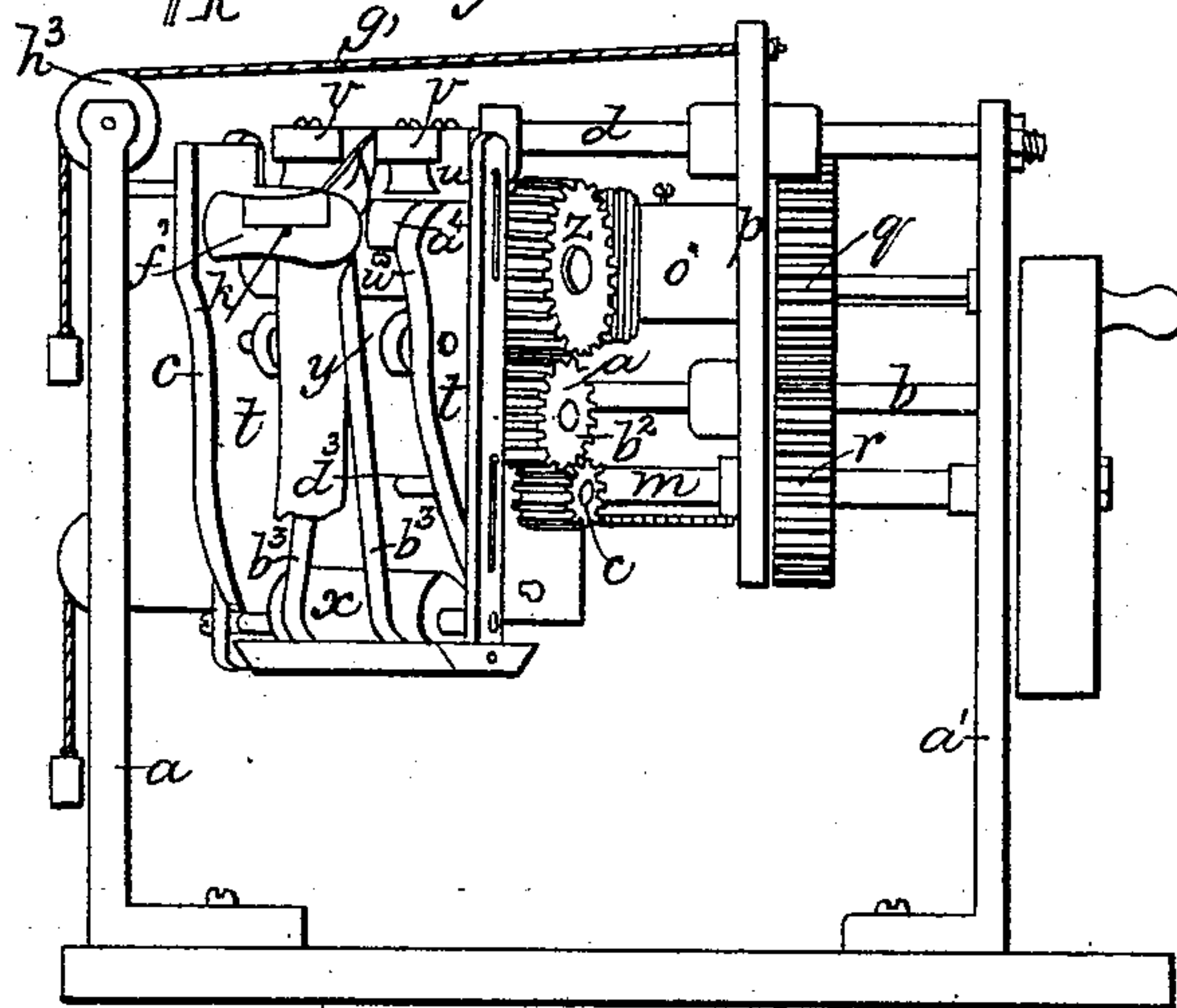


Fig: 2.



Witnesses

Chas. A. Loring  
Edward Griffith

Inventor

Joel Moulton  
by his attorney,  
Frederick Curtis.

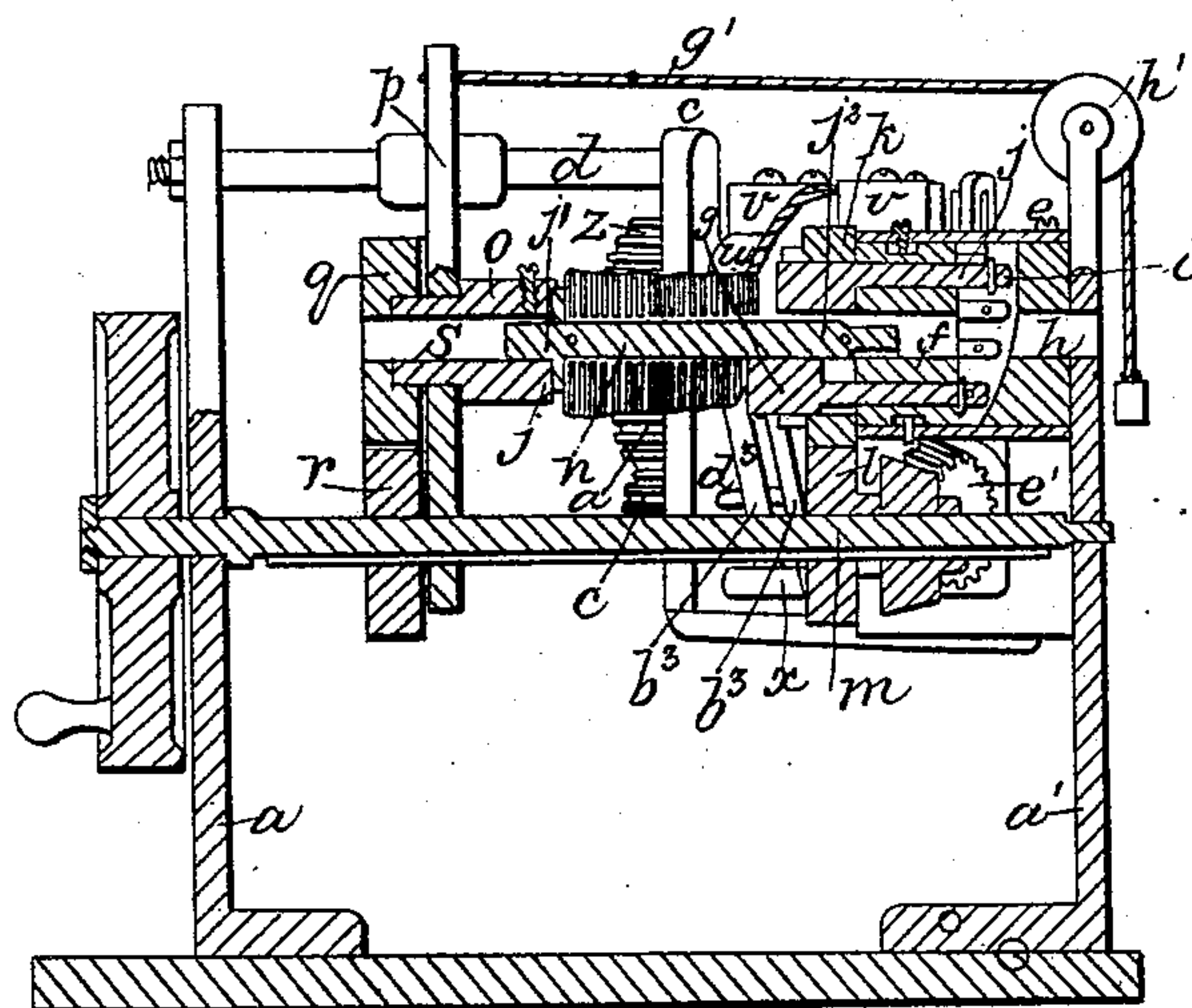
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*Fig: 3.*



Witnesses.

Geo. A. Loring  
Edmund Griffith

*Inventor*

Joel Moulton  
by his Attorney.  
Frederick Curtis



# United States Patent Office.

JOEL MOULTON, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 84,208, dated November 17, 1868.

## IMPROVED MACHINE FOR THE MANUFACTURE OF ELASTIC ROLLS AND TUBES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all to whom these presents shall come:*

Be it known that I, JOEL MOULTON, of Boston, in the county of Suffolk, and State of Massachusetts, have made an invention of a new and useful Machine for the Manufacture of Elastic Rolls or Tubes, for various purposes, especially for clothes-wringers; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a plan,

Figure 2, a side elevation, and

Figure 3, a longitudinal section of my machine.

The machine, comprising the subject of my present invention, is intended principally for the purpose of manufacturing elastic rolls, such as are illustrated and explained in Letters Patent of the United States, issued to me on the 10th day of March, 1868, and the 5th day of May, 1868, respectively, although the machine, in practice, may be found to serve various other useful purposes.

The machine above mentioned, consists, first, in a frame, suitably constructed for holding and rotating a metallic shaft, about which the elastic material is wound, and in combining therewith a series of "bunters" or hammers, for driving the layers or coils of rubber in close contact with each other, as they are wound about the shaft, the machine further being provided with means for folding the strips of rubber previous to being wound about the shaft, and of introducing into the fold thus formed, a metallic wire or string, in manner and for the purpose substantially as hereinafter explained.

In the drawings, above mentioned as accompanying this specification, and illustrating my invention, the main frame of the machine is exhibited as composed of two end uprights or standards, *a a*, united by a long horizontal rod or bar, *b*, and by a bracket or auxiliary frame, *c*, such frame being disposed between the uprights *a a*, and connected to one of them by a second horizontal rod, *d*, and to the opposite standard, in any suitable manner.

To the inner face, and at the upper part of the standard *a*, is fixed a cylindrical box or case, *e*, and within such box, and at its inner end, is disposed a circular head or carrier, *f*, which revolves freely therein.

This revolving carrier *f* contains a series of segmental plungers or "bunters," *g g*, &c., arranged concentrically about the axis of the carrier, and so as to leave a circular opening, *h*, circumscribed by them, the shanks of such "bunters" extending outward to the rear part of the case *e*, and with their extremities abutting against the face or terminus of a cam-groove, *i*, made in the inner end of the said case, a series of studs, *j j*, &c., being affixed to each shank, which, by impinging against the inner side of the said cam-groove, serve to retract the bunters, as they are revolved by the carrier *f*, while

the outer extremity of the cam-groove serves to advance the bunters.

The bunter-carrier *f* is revolved within the case *e*, by means of a spur-gear, *k*, affixed to its outer periphery, and in advance of such case, this spur-gear engaging with a twin spur-gear, *l*, affixed to a horizontal driving-shaft, *m*, supported within and by the standards *a a*, this shaft being provided with a suitable pulley for putting it in rotation.

The metallic shaft, upon which the elastic roll or tube is to be formed, is shown at *n* as having one of its ends extending loosely in the space *h*, within the bunters, and its opposite end securely held within a chuck or "collet," *o*, such chuck being supported, and so as to revolve, within a sliding carriage, *p*, this carriage, in turn, being supported upon the horizontal rods *b* and *d*, in such manner as to freely slide thereon.

The chuck *o* is provided with a spur-gear, *q*, for giving it a rotary motion, such gear engaging with a twin gear, *r*, sliding upon the driving-shaft *m*, before alluded to, and retained thereon by a spline, *s*, in a manner well known to mechanics, the gear *r*, while serving to rotate the gear *q*, also following the sliding movements of the carriage *p*.

The machinery for feeding the elastic material to the shaft is constructed as follows:

The auxiliary frame *c*, before mentioned, is placed at an obtuse angle to the main frame, and is composed of two "chucks," *t t*, united at top by a platform, *u*, of about half the length of such chucks, this platform having disposed upon it two or more upright twin rollers, *v v*, &c., placed opposite each other, and a short distance apart, as shown in the drawings.

A horizontal roller, *w* or *w'*, is disposed within the frame *c*, and upon opposite sides of the platform *u*, around which and two other rollers, *x x*, disposed at the lower part of the frame *c*, two endless bands or feeding-aprons, *b<sup>3</sup> b<sup>3</sup>*, travel, these bands being separated, in advance of the roller *w*, by an intermediate grooved roller, *y'*, and so disposed, with respect to the rollers, as, when passing between them, to be forced edgewise into an upright position between such rollers.

A trough, for holding naphtha, or other equivalent liquid, in case its use should be deemed necessary, is placed under the roller *x*, the object of the naphtha being to prevent the elastic materials from adhering to the belts *b<sup>3</sup> b<sup>3</sup>*, and for other objects.

The roller *w*, which is the driving-roller of the feeding-aprons or bands, is revolved by means of a spur-gear, *z*, fixed to its inner extremity, such gear engaging with a second and smaller gear, *a'*, revolving upon a stud, *b'*, fixed to the face of the chuck *t*, and below the gear *z*.

This last-mentioned gear engages with a pinion, *c'*, fixed to the inner extremity of a shaft, *d<sup>3</sup>*, duly supported by and revolving in the lower part of the frame *c*, the opposite and outer end of this shaft being pro-



vided with a bevelled gear, *e'*, which engages with another bevelled gear of somewhat smaller size, fixed to the driving-shaft of the machine, as represented in the accompanying drawings.

Furthermore, a friction-clamp, *f''*, is applied to the frame somewhat in advance of the roller *w*, while between such clamp and roller a guide, *a*, is applied for the purpose of maintaining the elastic material in the centre of the roller *w*.

The carriage *p* is advanced toward the box *c* and the bunters by means of cords, *g' g'*, &c., secured to its inner face, and extended about pulleys *h' h'*, suitably applied to the standard *a'* of the machine, a weight being applied to the extremity of each cord. Any suitable device, however, may be employed for advancing the carriage *c*.

The operation of the above-described machine is as follows:

The shaft, upon which the elastic roll or tube is to be wound or formed, is inserted, nearly its entire length, within the space *h*, before mentioned, a small hole, *i'* or *i''*, having been previously made through it, at or near each end, a collar, *j*, being formed upon the outer end of such shaft, and in advance of the hole *i'*, as represented.

A strip of elastic material, of suitable width, is led from a suitable source, and folded, and introduced between the two endless bands *b<sup>3</sup> b<sup>3</sup>*, a metallic wire, *k<sup>2</sup>*, being passed into the bottom of the fold of the elastic strip, as shown in the drawings, this wire being led through the clamp *f''*, before mentioned, which applies suitable tension to it. The elastic strip, thus folded, and carrying the wire *k*, is conducted to the shaft *n*, before mentioned, and the extremity of the wire fixed in the hole *i'* in the shaft, and with the elastic strip abutting edgewise against the collar *j* of the shaft.

The carriage *p* is next advanced, until the free extremity of the shaft *n* is inserted within the chuck, and tightly fixed therein, and the motive-power of the machine put in motion.

As the shaft *n* revolves, this elastic strip is wound edgewise about it, while, at the same time, the bunters *g g*, &c., by the action of the cam-groove, before described, are forced alternately inward, and, by their percussive force, serve to compress and condense the folds of the elastic strip tightly together.

As this elastic material accumulates upon the shaft, such shaft is forced outward, and with it the carriage *p*, until the desired amount of material has been deposited upon it, when the elastic strip and its wire are cut off and the extremity of the wire inserted and fixed within the opposite hole, *i''*, of the shaft.

The roll, thus formed, is then to be removed from

the machine, and subjected to the ordinary vulcanizing-process, and is then ready for use.

I would remark that the object in applying the frame *c* to the main frame, at an obtuse angle with respect to the axis of the roller-shaft, is to insure the winding of the elastic material tightly about such shaft, before being driven in contact with the next preceding layer upon such shaft.

I would also remark that instead of two or more rollers placed opposite each other, as shown at *v v* in the drawings, one or more rollers, upon one side only, may be employed, in connection with a fixed ledge or abutment upon the opposite side.

I claim as my invention—

1. A machine, so constructed and operating as to hold and rotate the roll-shaft, and to cause the elastic material and its accompaniments to be wound about such shaft, and condensed or tightly driven thereon, for the purpose substantially as before explained.

2. As an appurtenance or a part of the above-described machine, a device for folding and maintaining, in an upright position, the elastic material as it is fed to the shaft, and also for introducing into the fold of the elastic material a metallic wire or string, for the purpose as before premised and described.

3. For the purpose of condensing the folds of elastic material about the shaft, and for supporting one end of it in position while winding, the combination and arrangement of the case *c* with its cam-groove *i*, and the circular carrier *f* with its bunters *g g*, &c., the whole being arranged and operating essentially as herein shown and described.

4. In combination with the last-described arrangement of parts, the sliding carriage *p*, with its shaft, supporting-chuck or bearing *o*, such chuck being applied and operating as before referred to and described.

5. Applying the auxiliary frame *c* to the main frame, at an angle to its longitudinal axis, in manner and for the purpose as herein shown and explained.

6. The combination and arrangement of the endless bands *b<sup>3</sup> b<sup>3</sup>* and the rollers *v v*, &c., or their equivalents, for producing the same result, in combination with suitable supporting and feeding-rollers, as and for the purpose before set forth and exhibited.

7. The general combination and arrangement of the bunters *g g*, &c., and the shaft-supporting and operating adjuncts, the sliding carriage *p*, and the mechanism for folding and "wiring" the elastic material or strips, the whole operating together to produce results before set forth and explained.

Witnesses:

JOEL MOULTON.

FRED. CURTIS,

EDWARD GRIFFITH.