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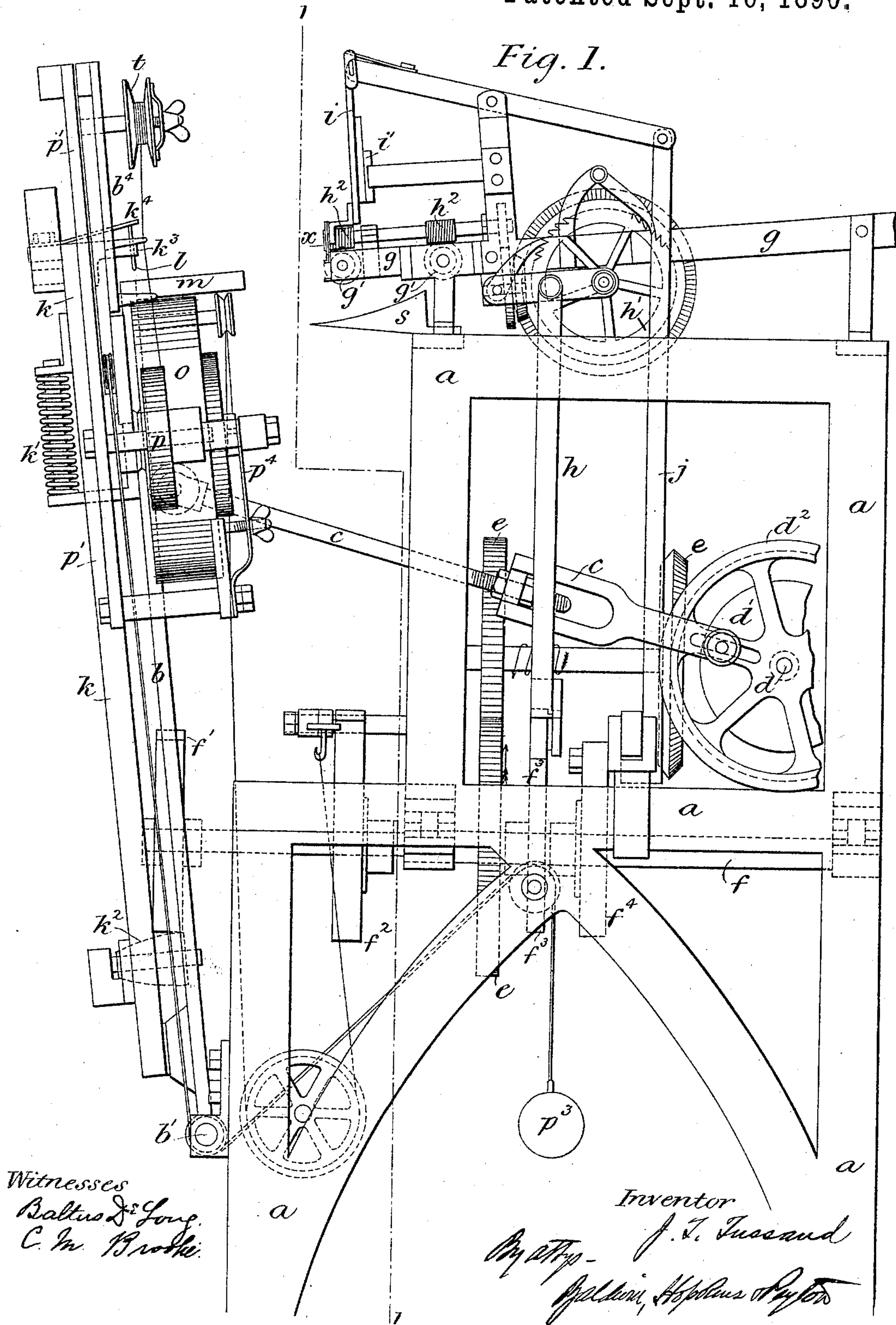
J. T. TUSSAUD.

PROCESS OF APPLYING FUR, &c., TO WOVEN FABRICS, &c.

No. 436,389.

Patented Sept. 16, 1890.

Fig. 1.



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(No Model.)

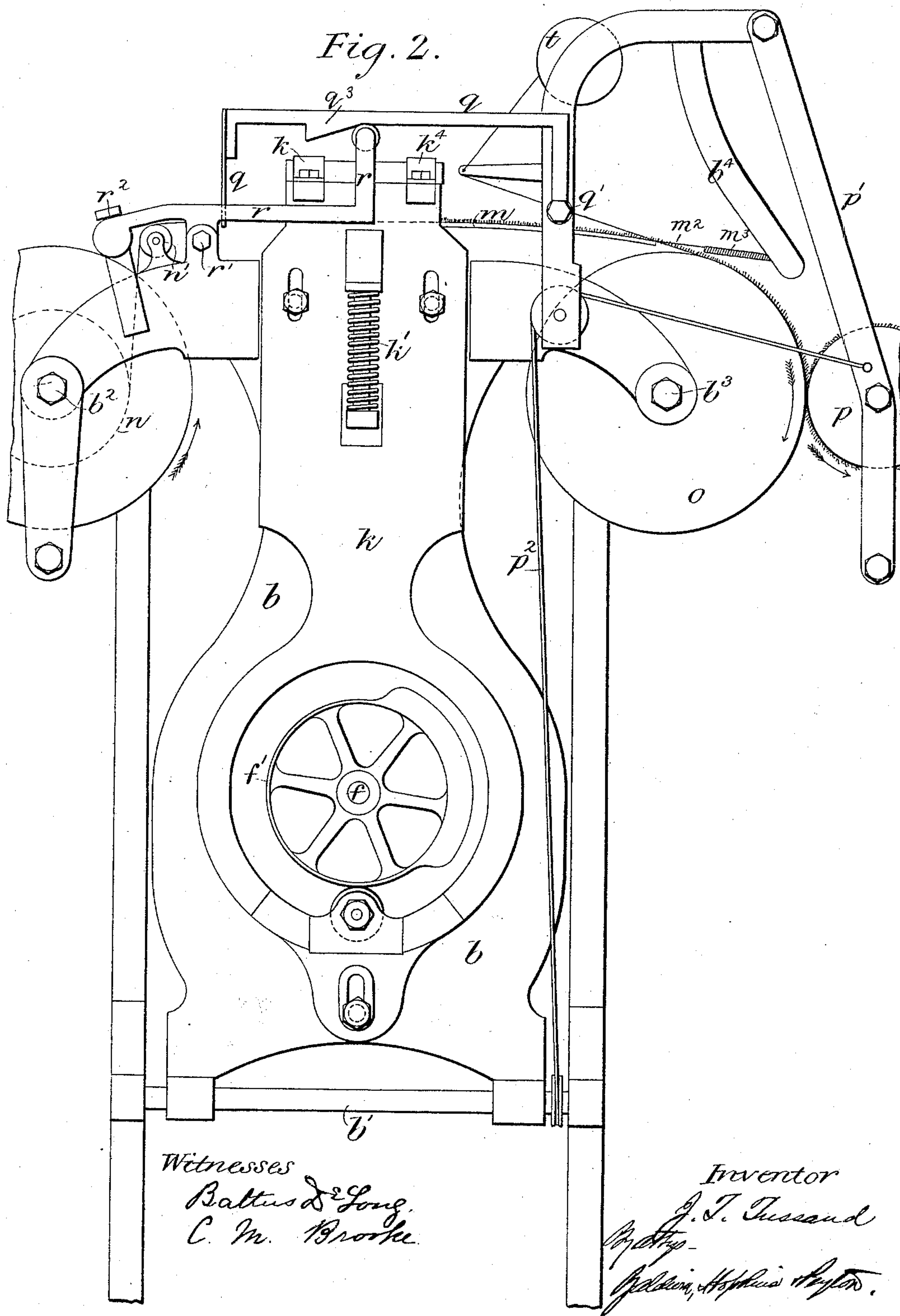
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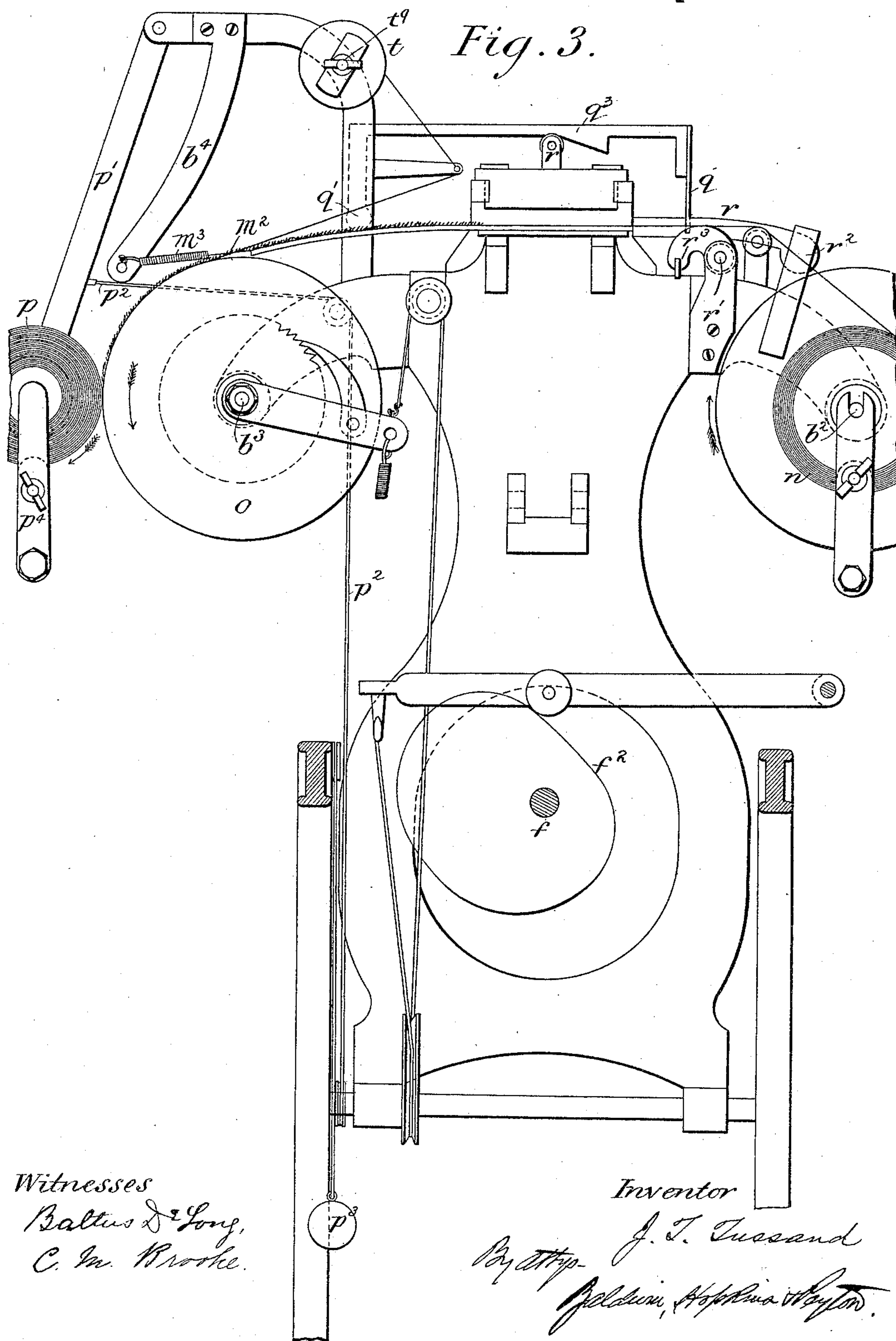
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(No Model.)

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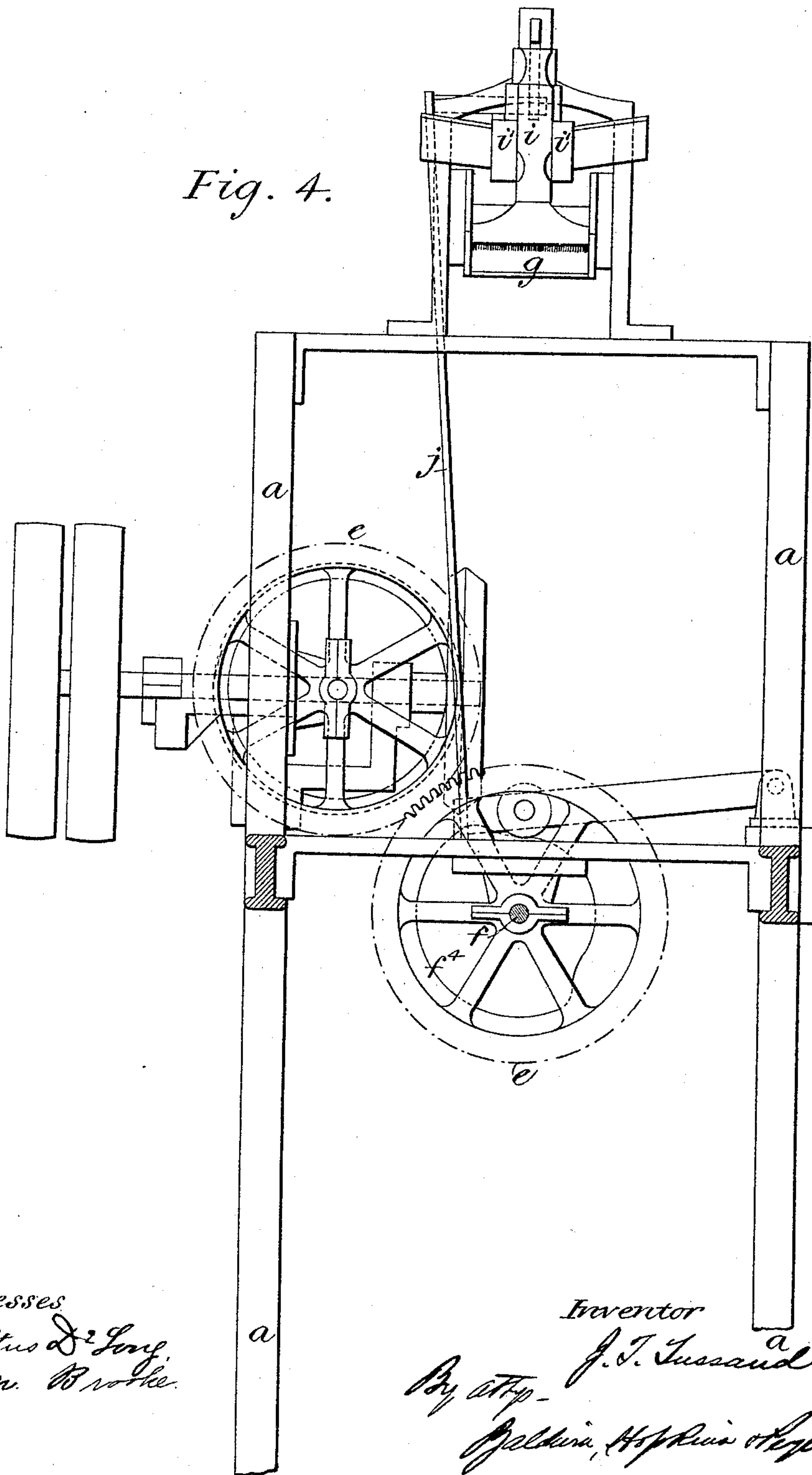
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Fig. 4.



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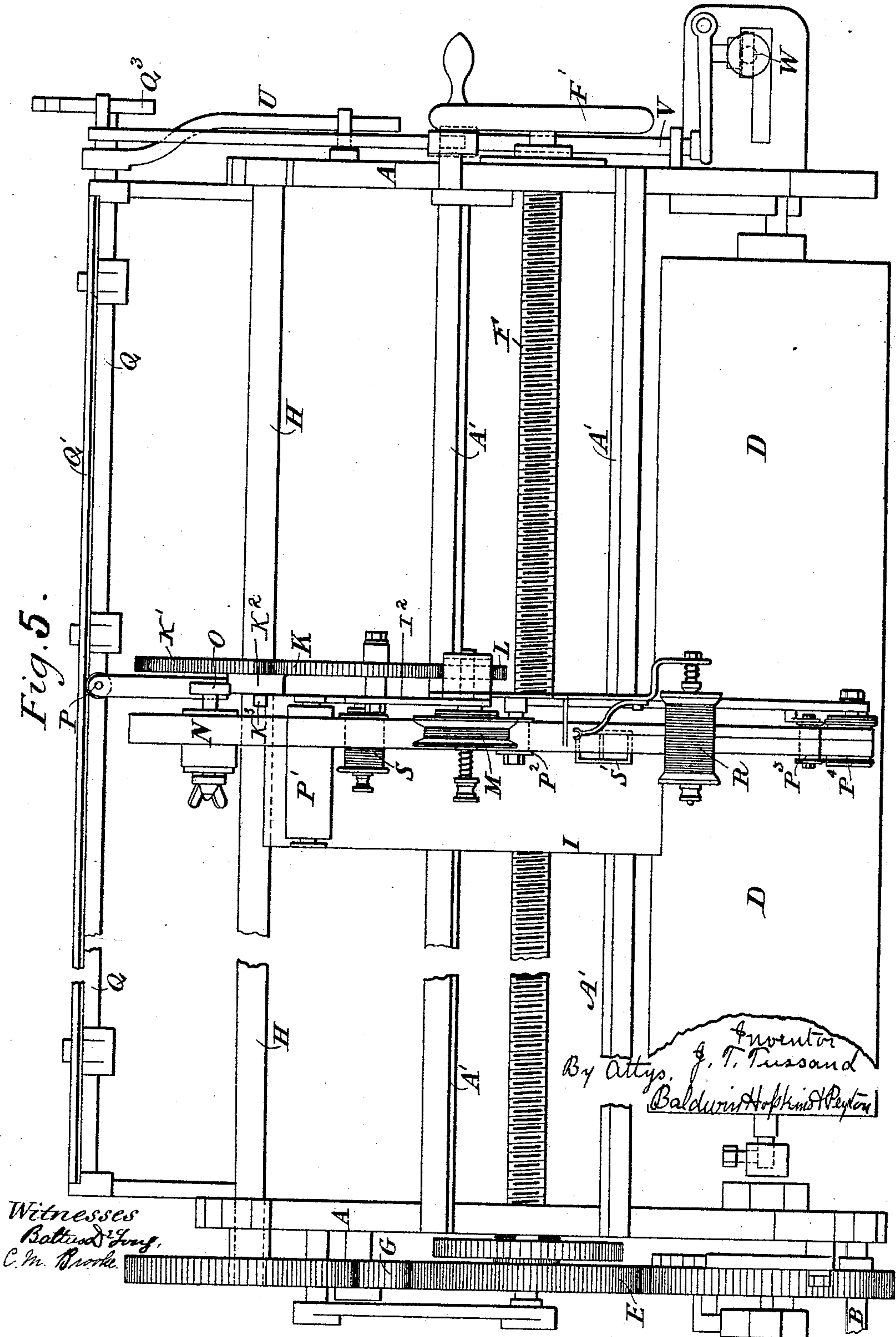
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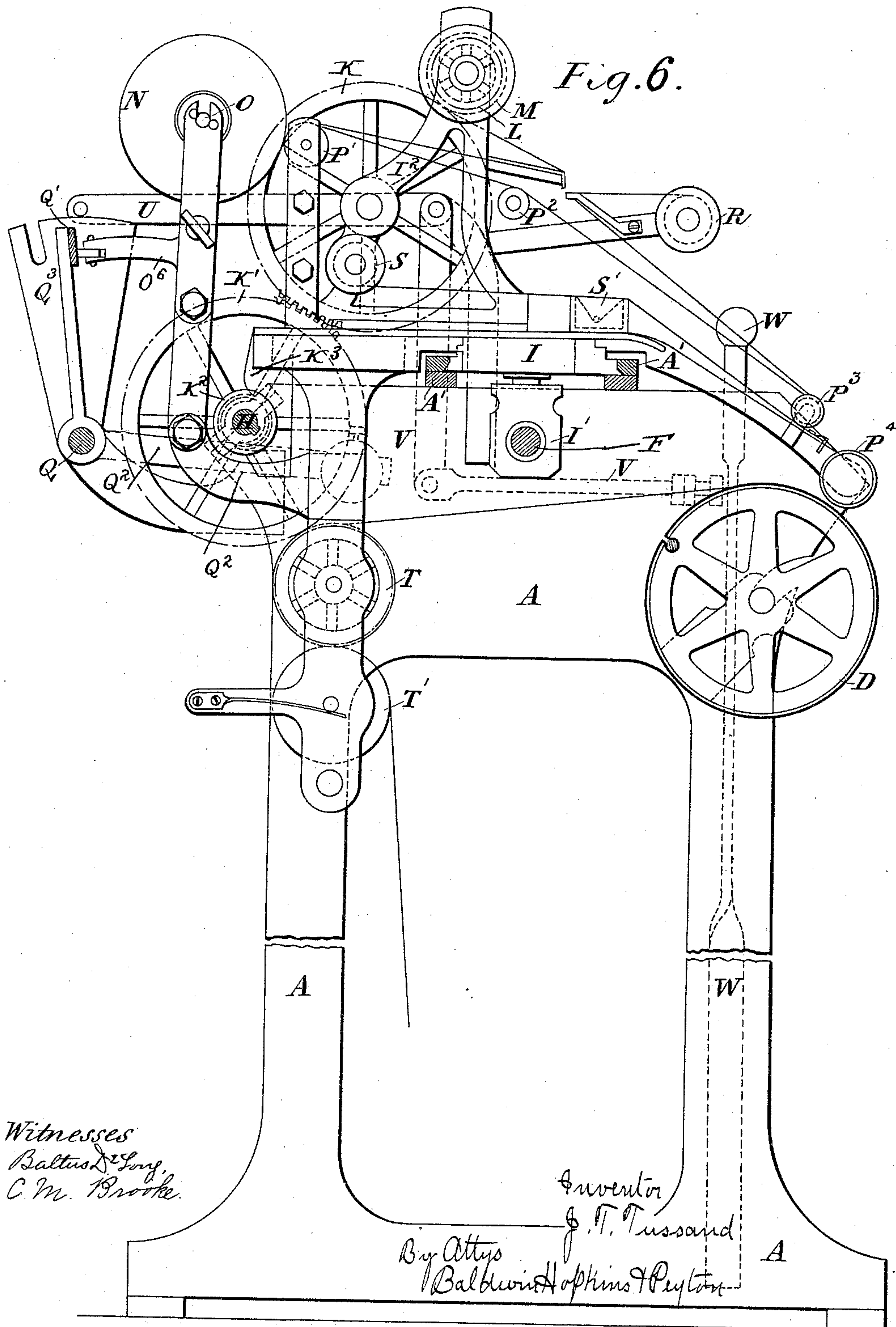
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(No Model.)

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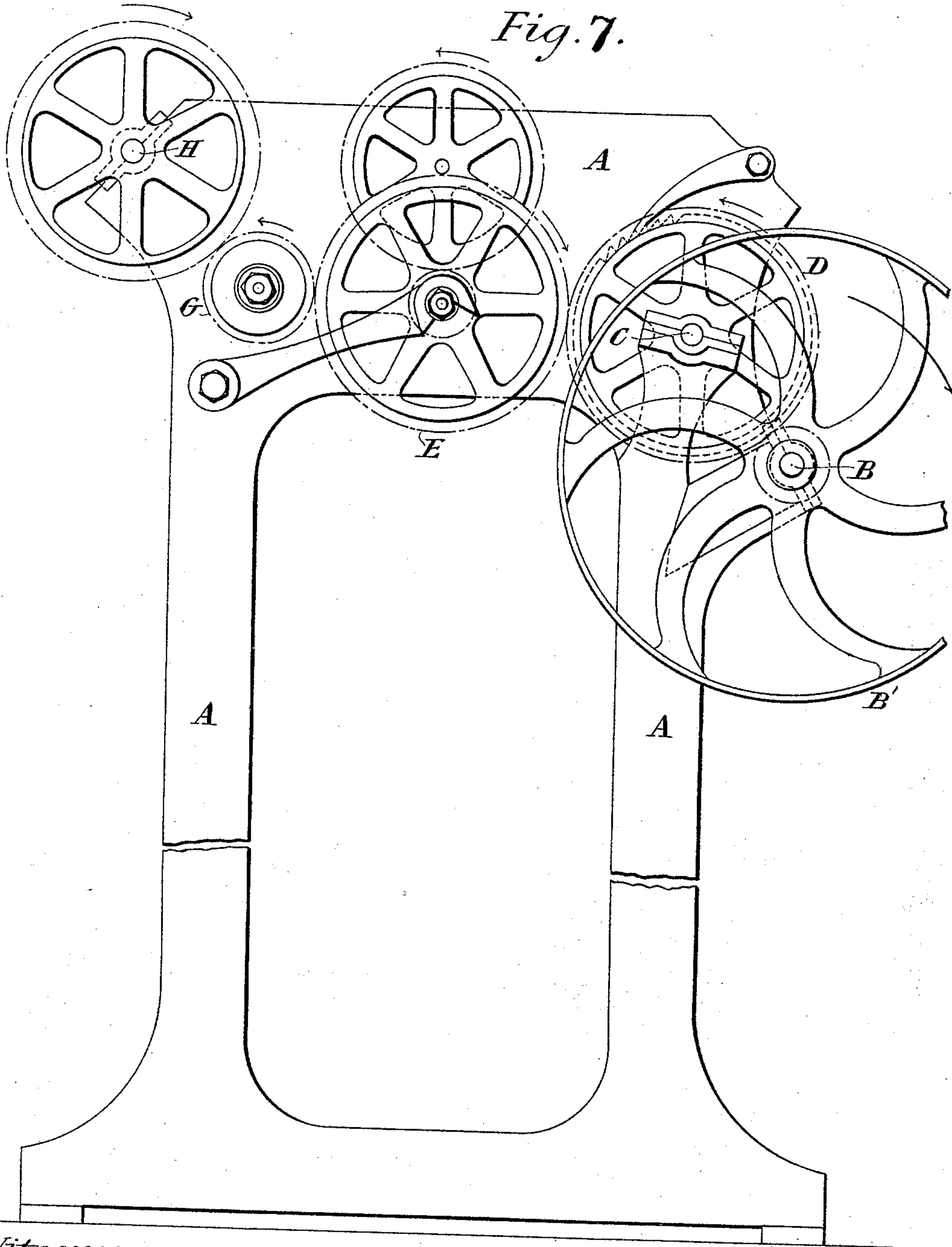
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Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN THEODORE TUSSAUD, OF LONDON, ENGLAND.

PROCESS OF APPLYING FUR, &c., TO WOVEN FABRICS, &c.

SPECIFICATION forming part of Letters Patent No. 436,389, dated September 16, 1890.

Application filed November 1, 1887. Serial No. 253,966. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN THEODORE TUSSAUD, artist, a subject of the Queen of Great Britain, residing at Salisbury House, 105 Marylebone Road, London, W., England, have invented certain new and useful Improvements in the Process of Applying Fur, &c., to Woven Fabrics, &c., of which the following is a specification.

10 This invention has for its object a process for applying fur, hair, wool, or other fiber or feathers to woven fabrics or other receiving-surfaces.

15 The process when employed upon fur serves to utilize pieces of small size or irregular shape or pieces which for other reasons are of small value. The fur or hair is first removed from the skin, the natural arrangement of the fur or hair being retained as far as possible. Then
20 separate tufts of the fur or hair are detached, and these tufts are accumulated side by side upon a tape of velveteen or other like carrying-surface. The continuous line of fur tufts so obtained is wound spirally upon a roller
25 clothed with a fabric the surface of which has been previously prepared with cement. The fur tufts are thus made to adhere by the root end to the receiving fabric or surface, which when thus clothed closely resembles
30 a natural skin.

The process when employed upon hair, wool, or other fiber or feathers is similar. Tufts are taken from a regularly-disposed sliver or mass of hair, wool, fiber, or feathers, and these
35 tufts are accumulated side by side upon a tape or carrying-surface. The continuous line of tufts so obtained is wound spirally upon a roller clothed with the receiving fabric or material, and the tufts are thus attached at one
40 end only to the prepared surface of this fabric or material. The product more or less resembles a natural skin, and may in like manner be made into garments or employed as trimming for the same.

45 In carrying this process into effect I prefer to employ machinery which I will proceed to describe by the aid of the drawings annexed. This machinery in part I have made the subject of another patent application, Serial No.
50 302,365, filed March 7, 1889. 436390

In the drawings, Figure 1 is a side elevation of the machine by which the fur is ac-

cumulated on the tape of velveteen or like material. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical transverse section
55 taken on the line 1 1 in Fig. 1 and as seen looking to the left. Fig. 4 is a similar view as seen looking to the right. Fig. 5 is a plan of the machine by which the fur is transferred from the tape to the cemented back which
60 finally receives it. Fig. 6 is a vertical transverse section of this machine, and Fig. 7 is an end elevation of the same.

In Figs. 1, 2, 3, and 4, *a a* is the fixed framing of the machine, and *b* is a frame jointed
65 to it at *b'*. The frame *b* is caused to rock to and fro. It is connected by the adjustable rod *c* with the adjustable crank-pin *d'* on the back of the beveled wheel *d*² on the main shaft *d*, which is driven in any convenient
70 manner. By means of the intermediate gear-wheels *e* the cam-shaft *f* is rotated at the same speed as the main shaft. The cam-shaft carries four cams *f'*, *f*², *f*³, and *f*⁴, which control the movements of various parts of the ma-
75 chine, as hereinafter described.

g is the feed-trough mounted on the frame *a*. It is rectangular in form and open at the top. The fur is laid in the trough by hand in the state as nearly as may be in which it
80 lies on the back of the animal, excepting only that it has been removed from the skin by machinery or otherwise with as little derangement as possible. It is, however, divided into
85 widths such as the trough can receive, and it is laid in the trough with the roots of the hair downward and the points inclining upward and to the rear.

g' g' are two feed-rollers extending across the trough. Their surfaces are roughened like
90 files and the fur passed beneath them and is held between them and the polished bottom of the feed-trough. The cam *f*³ gives motion to these feed-rollers intermittently and about at the time when the parts are in the position indicated in Fig. 1. The cam operates on a bowl
95 carried by a lever to which the rod *h* is connected. The rod *h* gives motion to a lever and driving-pawl, and so drives a ratchet-wheel *h'*. On the same axis with the ratchet-wheel there
100 is a wheel with beveled teeth gearing with a corresponding pinion, and this, by intermediate spur-wheels, transmits motion to an axis on which are worms *h*² *h*², which drive worm-

wheels on the axes of the feed-rollers $g' g'$. By this feed-gear the fur is advanced slowly and intermittently, and as tuft after tuft is removed still fur is presented with the roots projecting just beyond the lip of the feed-trough.

i is a bar sliding up and down a short distance in stationary guides i' . It carries at its lower edge a comb, the pins or teeth of which enter among the fur in front of the foremost feed-roller. This comb is down in the fur at the time when, as hereinafter more fully described, the tuft of fur is robbed from the trough; but it is raised out of the fur at the time when the feed-rollers revolve to drive the fur forward.

The bar i is loosely jointed at its upper end to a rocking lever, and a spring is provided at the joint to avoid the necessity for accurately adjusting the stroke of the rocking lever. The rocking lever is connected by a rod j with a lever carrying a bowl, which rests constantly upon the periphery of the cam f^4 . Upon the rocking frame b a slide k is mounted. It is supported by the spring k' , which causes the conical bowl k^2 to bear constantly upon the face of the cam f' .

l is a nipping-blade, which is carried by the slide k in guides k^3 , in which it can rise and fall; but it is held down by the springs $k^4 k^4$, and these yield only when the lower edge of the blade is firmly pressed upon a surface beneath. This surface is a plate or table m , fixed to the rocking-frame b . When the frame advances, the table passes beneath the lip of the feed-trough g . The frame b has arms upon it, which carry the two stud-axes b^2 and b^3 . On the first the drum n is mounted, and from this is unwound the velveteen tape, upon which the tufts of fur are laid. The latter supports a roller o , having a roughened file-like surface. The tape drawn from the drum n passes over a guide-roller n' to the table m , and along this table to the roller o , which, being driven with a step-by-step motion, winds the tape forward, and, finally, with the fur upon it, the tape is wound upon the drum p . The drum p is carried by a pendulous arm p' to which a cord p^2 is attached. The cord passes over guide-pulleys to a weight p^3 , which holds the drum p up to the face of the roller o . The roller o is driven by a lever and driving-pawl engaging with a ratchet, and the lever is actuated by a cord passing over pulleys to another lever, and on this is a bowl bearing on the periphery of the cam f^2 . A spring causes the return of the driving-pawl. The pendulous arm p' also carries the adjustable spring p^4 , which, pressing against an intermediate or filling piece or pieces, keeps the drum p in place and applies a suitable friction. When the spring is slackened and the filling-pieces removed, the drum p , when full, can be taken out and another put in its place. In connection with the drum n similar means of adjusting friction are provided, so that the drum may not unwind too freely. By the mechanism which I have described for each

to-and-fro movement of the rocking frame the velveteen tape is moved a step forward equal about to the width of the feed-trough, so that each tuft of fur may be deposited in a fresh place. On the rocking frame also there is an arm b^4 , to which a wire m^2 is attached by a spring m^3 , which keeps it constantly tight. This arm also carries a guide-eye t' for the thread. The other end of the wire is attached to the end of the lever-arm q , which has its fulcrum at q' . An inclined face q^3 of the arm q rests upon a roller at the extremity of another arm r , fixed on an axis r' , and a stop r^2 limits the movement of the arm r . On the same axis r' and affixed to the arm r is a short arm r^3 , Fig. 3, carrying a roller, and this, when the rocking frame advances to the feed-trough, comes against the incline s , Fig. 1, fixed to the frame a . t is a bobbin, from which a thread is drawn and the tension of which by the nut and spring t^9 can be adjusted. The action is then as follows: The frame b advances to the feed-trough until the end of the trough projects over the table m , the wire m^2 being then lifted out of the way by reason of the roller on the shaft-arm r^3 striking the incline s and rocking the arm r , which causes the roller carried thereby to bear upon the incline q^3 of the arm q and lift the same, thereby moving the wire m^2 out of the way. The nipping-blade l then descends and nips the tuft projecting from the trough between its edge and the surface of the velveteen tape lying on the table. The rocking frame then retires, taking with it the tuft which has been nipped, but no more, for the rest of the fur is kept back in the feed-trough by the comb on the bar i . Afterward the comb rises and the forward feed of the fur takes place. The tuft taken away by the rocking frame now rests upon the velveteen tape with the roots of the fur overhanging the edge of the tape. The fur clings to the surface of the tape, and it is held also by the wire m^2 , which descends upon it before the nipping-blade rises and releases it. The wire, however, does not impede the onward movement of the fur when the tape travels on. As the tape with the fur upon it advances, it meets the thread from the bobbin t , which lies upon the velveteen and binds the fur down onto the tape and passes on with it until the whole is wound together onto the drum p .

In Figs. 5, 6, and 7, A is the framing of the machine. It carries an axis B, on which is a belt-pulley B'. A pinion on the axis B drives a spur-wheel on the axis C, and the axis of the drum D is clutched fast with the axis C. A ratchet and pawl are provided to prevent the drum D being turned the wrong way. The wheel E is mounted on a stud-axis, and it gears with the wheel on the axis C. It can, however, be slid along the stud-axis and drawn out of gear when desired. A pinion fast with the wheel E gears with a wheel on axis F, on which a screw-thread is cut. When the wheel E is out of gear, the axis F can be

turned by hand by means of the hand-wheel F' at its farther end. The wheel E also gears with an intermediate wheel G, and this drives a wheel on the axis H. I is a saddle capable of sliding along guides A' A' on the frame A. On the saddle there is a nut I', engaging with the screw-thread on the axis F. The saddle carries a toothed wheel K, supported in a standard I², gearing with a corresponding wheel K'. The hub K² of this wheel K' is free to slide on the shaft H, being provided with a groove in which is mounted a feather carried by the shaft, and is provided with a peripheral groove, with which an arm K³, Fig. 6, carried by the saddle I, engages, and thus causes the wheel K' to move laterally with the saddle. The wheel K also gears with and drives a pinion L, on the axis of which a bobbin M is carried and rotated by friction. The bobbin or drum N is the same that received upon it the velveteen tape and fur from the previous machine. This tape is now to be unwound. The bobbin or drum N is carried by an arm O, pivoted to a bracket-arm O², Fig. 6, below the saddle, and is pressed up to the guide-roller P' by a rail Q', bearing against a roller in the end of the arm O⁶ of the arm O and carried by a frame Q³, swinging on an axis Q. Q² is an arm on the axis Q, which is weighted and gives to the frame Q³ carrying the rail a suitable preponderance toward the roller P. The velveteen tape passes over other guide-rollers P', P², P³, and P⁴ to the surface of the drum D, which is clothed with a woven fabric, which is prepared with oxidized oil or other cement and is in a tacky condition. As the velveteen tape is unwound from N the thread which was wound with it is taken up upon the bobbin M, and another thread drawn from a bobbin R may be passed down onto the fur to securely hold it. Another thread drawn from a bobbin S is also employed, and in order to facilitate its subsequent removal it is moistened by passing through a water-trough at S'. It runs by the side of the velveteen tape in a groove in the guide-pulley P⁴, so that when the fur on the tape reaches the surface of the drum D this moistened thread bears on the root ends of the hairs and nips them against the surface of the drum. Thus the fur with the threads is wound spirally around the drum D by reason of the revolution of the drum and the slow movement of the saddle carrying the velveteen tape in a direction parallel with the axis of the drum, and the root ends of the fur become attached to the tacky cement on the fabric with which the drum is clothed. The velveteen tape passes from the drum D to a drum T and between this and another drum T'. Springs hold the drums T and T' in contact. These drums are both carried by the saddle, and the drum T is driven by a pinion on its axis gearing with the wheel which traverses with the saddle along the axis H. When the bobbin or drum N is empty, a pin on a lever U drops into a notch in the arc Q³

on the axis Q, and then the other arm of the lever U operates by means of the pusher V to disengage the spring-handle W from a retaining-notch. The handle W when so liberated operates in the usual way to throw off the driving-belt and automatically stop the machine.

I will now describe somewhat more in detail the way in which I prefer to prepare the fur and the receiving-surface.

I cleanse the fur, &c., if necessary, from grease and dirt and then operate upon the natural skin for the purpose of loosening the fur, &c., by soaking the skins or painting them on the flesh side with lime, or a combination of lime and sulphide of sodium, or by any other suitable means as practiced by tanners. When the fur, &c., is sufficiently loose, I drain the skins from excessive moisture and nail or stretch them on a board or other suitable surface, fur upward, and I apply to the fur a warm solution of sulphate of soda, so as, when cool or set to a sufficient degree of solidity, to hold the fur, &c., or other covering in correct relative position while the natural support is removed, after which the fur, &c., so held by the temporary holding means is dried and the roots cleansed or freed from dirt or epidermis. I place the fur held as described by the temporary holding means between two frames made of wire-netting or perforated metal, so as to cover the fur on both sides, the mesh or holes being fine enough to prevent the fur working through. After placing the fur in the frames I immerse it in a bath containing a warm solution of sulphate of soda, so as to melt the soda or temporary holding means contained in the fur. Afterward I pass the frames so containing the fur through warm water with a little soda until the fur within the frames is well cleansed from the temporary holding medium, when, after rinsing, it may be dried in the frames or may be removed from them and placed on a large frame of wire-netting or any other suitable surface ready to be treated by the machine.

When the skin is of little or no value or not worth saving, the fur may be separated from the skin by cutting it off by means of the ordinary fur-cutting machine as employed for the purpose of manufacturing felt.

The following is the manner in which the receiving-cloth is prepared: I first give the material upon which the fur, &c., is to be attached a first coating of boiled linseed-oil of a sufficiently-thick consistency so as not to sink through the cloth, which I then dry by submitting to a gentle heat in a stove or oven, and when this coating is dry I place or stretch it upon the roller or drum, and while on the roller I spread or work a second coating, and when this coating is set and while still moist I spread or work a third coating, or in like manner as many coatings as may be necessary to hold the fur, &c., when it is worked onto it by the machine. If the linseed-oil is too thick to be spread

with convenience upon a cloth or receiving-surface, I render it down or dilute with a small quantity of benzoline or other suitable spirit, so as to make it spread easily upon the cloth or other receiving-surface. After the fur, &c., is so worked upon the rollers as above described the ground thread may be unwound from off the roots of the fur, &c., and the piece of fur, &c., so manufactured may be taken from off the roller and nailed or placed upon a board and stoved or placed in an oven and subjected to such a heat as usually employed by japanners or for the purpose of enameling hides or leather or in the manufacture of American cloth.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The process, substantially as herein described, of applying fur to a receiving-sur-

face, consisting in detaching tufts from the naturally-arranged fur, accumulating such tufts side by side upon a carrying-surface, and subsequently applying the tufts to an adhesive surface to which they become attached, substantially as set forth.

2. The process, substantially as herein described, of applying fur, hair, or other fiber or feathers to a receiving-surface, consisting in accumulating such material in tufts side by side upon a carrying-surface and subsequently applying them spirally to a fabric or equivalent substance arranged in cylindrical form and having an adhesive surface to which the tufts become attached.

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