

(No Model.)

4 Sheets—Sheet 1.

J. S. TAPLEY.

MACHINE FOR MAKING WOOL FELT ARTICLES.

No. 424,661.

Patented Apr. 1, 1890.

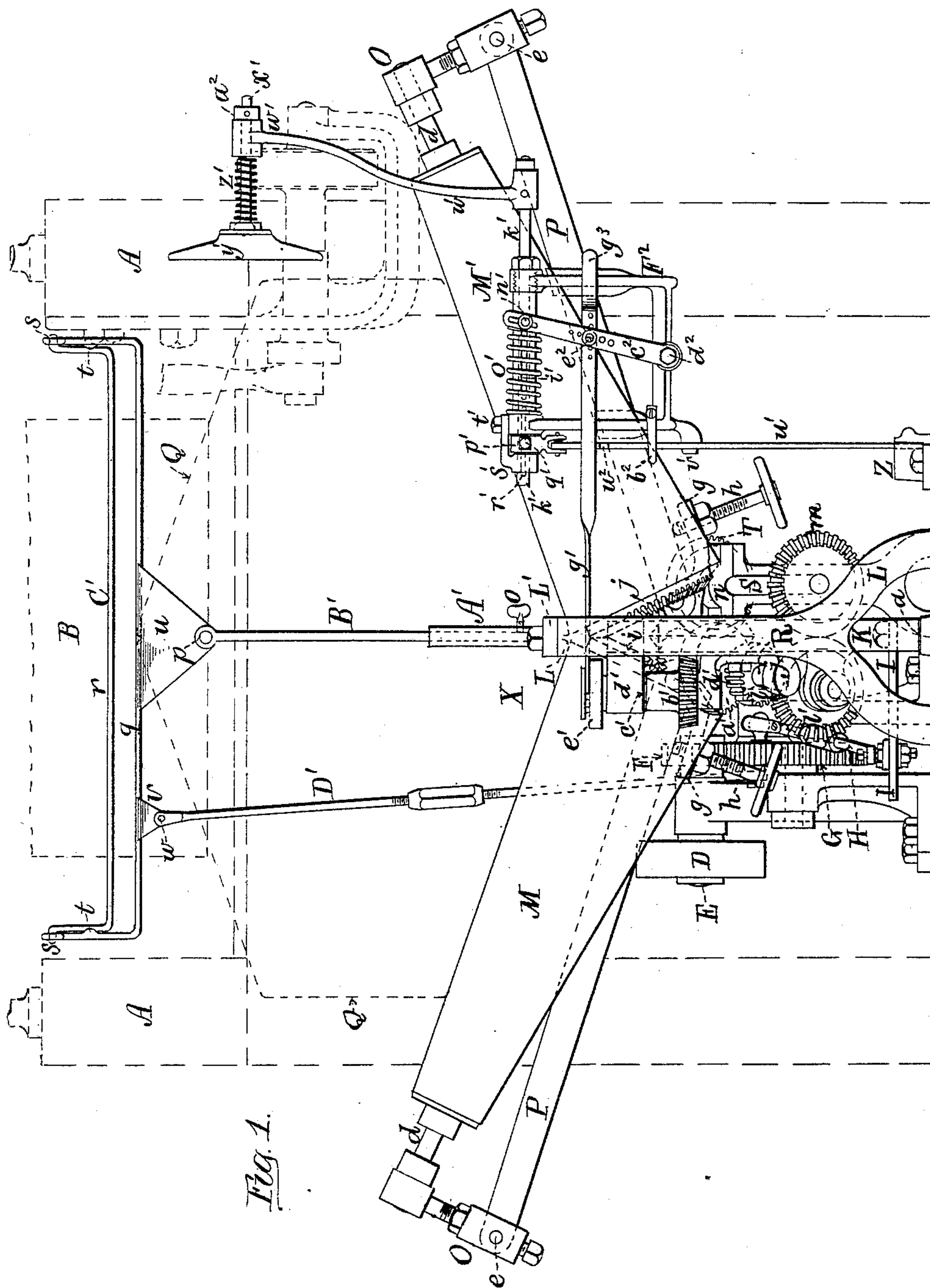


Fig. 1.

Witnesses

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John S. Tapley.
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(No Model.)

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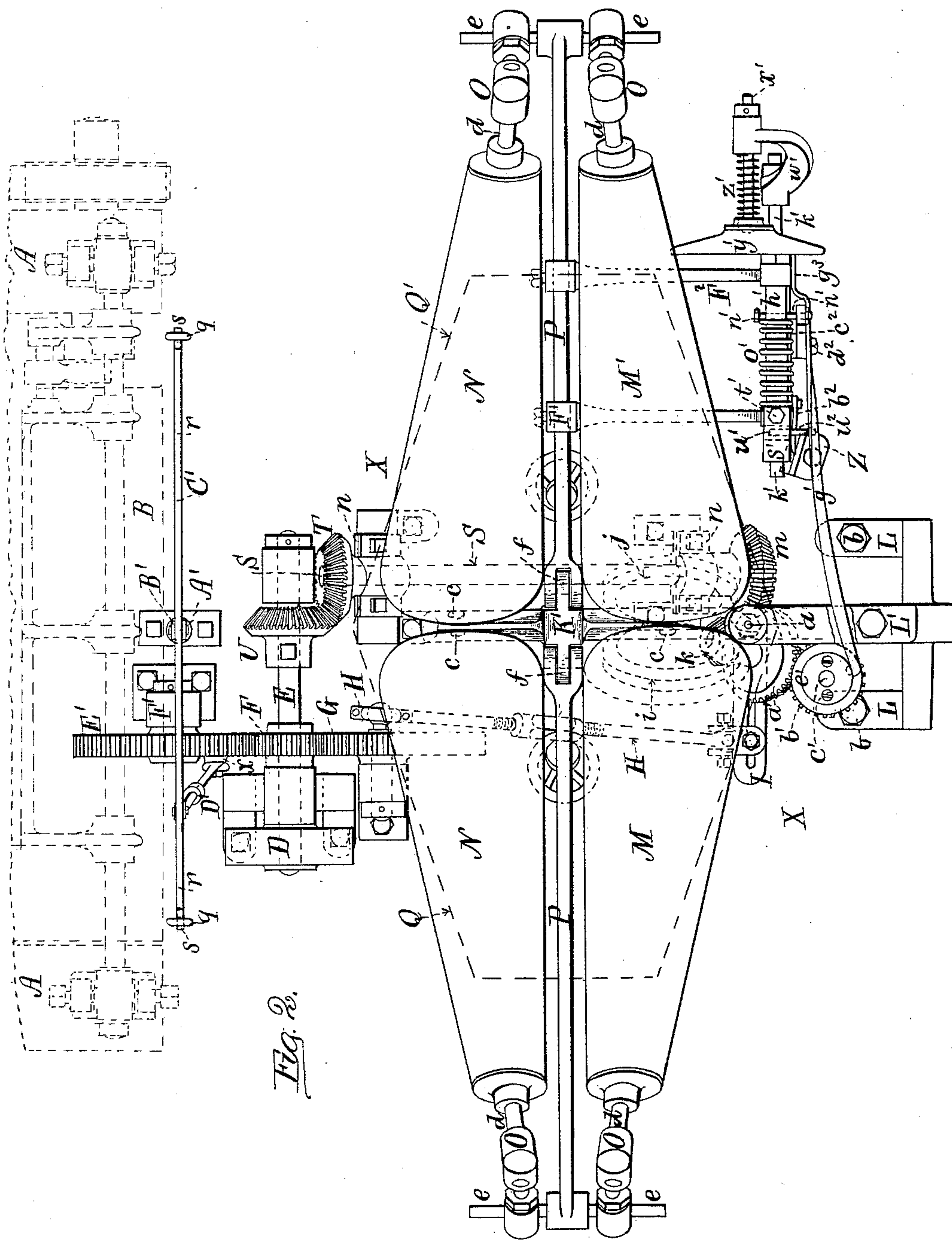


Fig. 2.

Witnesses

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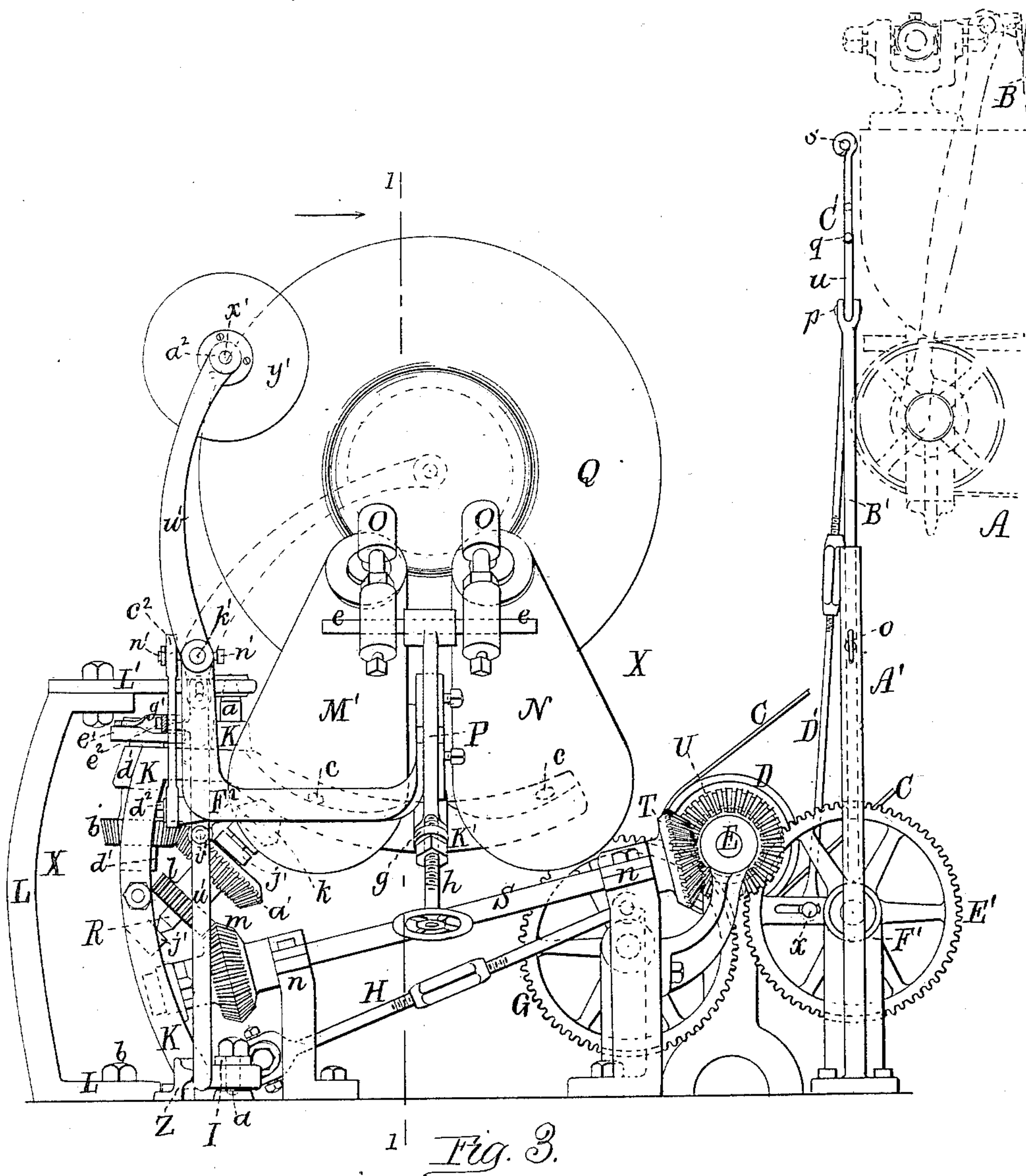
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Witnesses

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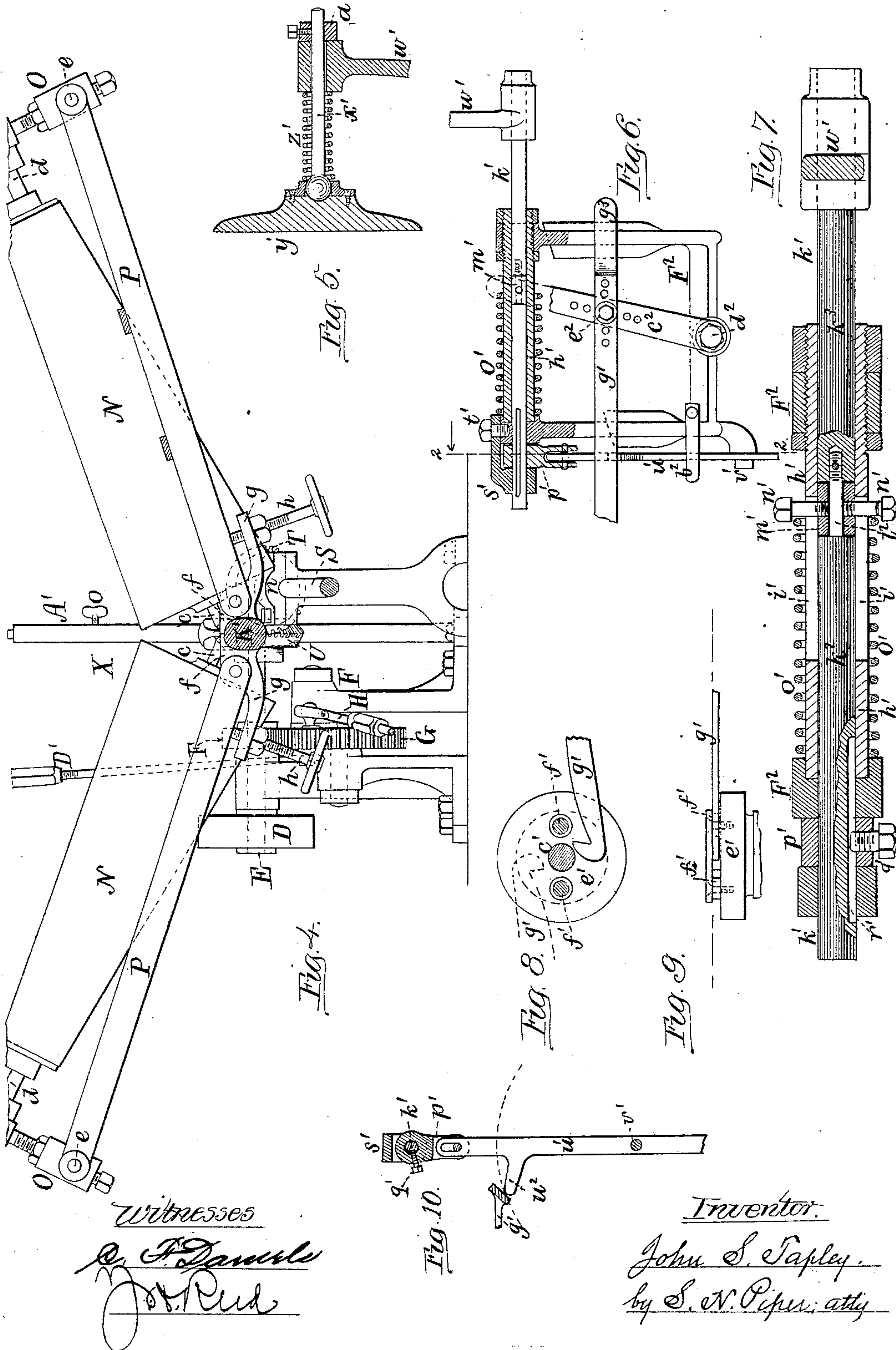
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UNITED STATES PATENT OFFICE.

JOHN S. TAPLEY, OF METHUEN, MASSACHUSETTS.

MACHINE FOR MAKING WOOL-FELT ARTICLES.

SPECIFICATION forming part of Letters Patent No. 424,661, dated April 1, 1890.

Application filed January 24, 1890. Serial No. 338,011. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. TAPLEY, a citizen of the United States, residing at Methuen, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Making Wool-Felt Articles—such as hats, boots, shoes, &c.—and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is an end elevation, Fig. 2 a top view, Fig. 3 a side elevation, and Fig. 4 a transverse section on line 1 1 of Fig. 3, of a mechanism in common use for supporting and revolving the cones or forms on which the web as it passes from the doffer of the carding-machine is laid in the forming of wool hats, with my improvements applied thereto for automatically guiding said web and laying it on said cones or forms, as hereinafter fully set forth. Fig. 5 is a longitudinal section of what I term the "patter," showing its supporting-rod and spring, and also a part of its sustaining arm. Fig. 6 is a sectional elevation of the greater portion of the mechanism for operating the patter. Fig. 7 is a horizontal section of the bearings and sleeve in which the shaft to which the patter-sustaining arm is secured slides. Fig. 8 is a sectional plan view, and Fig. 9 a side view, of the head which operates with the catch-arms connected to the patter mechanism to move the patter toward the cones or forms. Fig. 10 is a transverse section taken on line 2 2 of Fig. 6.

The nature of my invention consists in providing a vibratory guide to receive the web as it leaves the doffer of a carding-machine, and also in arranging said guide with and connecting it to the mechanism for revolving and oscillating the cones or forms used in the manufacture of wool-felt goods—such as hats, boots, shoes, &c.—in such manner that said guide will operate simultaneously with the said mechanism and cause the said web passing through it to be automatically wound or laid on said cones or forms so as to properly cover them.

My invention further consists in a mechanism for automatically closing the said web over the ends of the forms while being wound thereon, as hereinafter fully set forth, said mechanism being defined in the claims presented.

In the drawings a portion of the frame of a carding-machine is shown in dotted lines at A, and the doffer thereof at B, a hat-body-form supporting and operating mechanism (shown at X) being arranged in front of the said doffer, as represented in Figs. 1, 2, and 3, and is operated by a belt C from said carding-machine, which belt runs around a pulley D, fixed to a shaft E, said shaft provided with a pinion F, engaging a crank-gear G, the crank of the latter being joined by a connecting-rod H to a slotted arm I, projecting from an oscillatory frame K, said frame arranged to swing in a horizontal plane on pivots *a a*, sustained in bearings, one of which is secured to the floor and the other being formed in an arm I', supported by a standard L, secured to the floor by bolts *b b*, as represented. An arm K' extends from the frame K, of which it is a part, and supported in bearings in said arm are the lower journals *c* of two pairs of truncated cones M M' N N, the upper journals *d* of said cones being sustained in adjustable bearings O O, supported so as to swivel on cylindrical rods *e e*, fixed in the arms P P, said arms being jointed at their inner ends to ears *f f*, projecting in opposite directions from the said arm K'. Other arms *g g*, projecting from the said arm K', extend underneath the said arms P, and each arm *g* sustains an adjusting-screw *h*, which bears against the arm P and permits of its adjustment to vary the inclination of the cones M M' N N to cause them to properly sustain the double-truncated hat-cones or body-forms Q, supported on the cones M M' N N, as shown in Figs. 1 and 2 in dotted lines and in full lines in Fig. 3. The cones M M' each have fixed to their bases a bevel-gear *i* or *j*, which engage each other and connect said cones, one of said gears—viz, that marked *i*—engaging with a bevel-pinion *k*, fixed to an inclined shaft R, supported in bearings *j'*, fixed to the frame K. Another gear *l*, fixed to the said shaft R, engages an intermediate bevel-gear *l'*, supported in a

bearing fixed to the frame K, (see Fig. 1,) said gear l' engaging a bevel-gear m , secured to an inclined shaft S, supported in bearings n , said shaft S having secured to its upper end a bevel-gear T, which engages a bevel-gear U, fixed to the shaft E, hereinbefore referred to.

The carding-machine being in operation, motion will be imparted to the shaft E by the belt C. The shafts S and R and their connecting-gears will revolve and turn the cones M M' on their axes, which will revolve the double-truncated cones or body-forms Q, the latter causing the cones N N' also to turn. A vibratory motion will also be given to the frame K by means of the connecting-rod H, jointed to the arm I of the said frame K and to the crank-gear G, the latter engaging the pinion F, fixed to the shaft E.

The mechanism thus far described comprises that which is now in common use in the manufacture of wool hats, and when in operation requires the constant attention of an attendant to guide the web and cause it to be properly laid and wound on the body-forms Q while being reciprocated and revolved. The position of the attendant is in front of the standard L and facing toward the doffer, and as the frame K swings or vibrates on its pivots $a a$ he guides the web with his hands as it comes from the doffer and sees that it winds around the body-forms in a proper manner, and as the ends of the said body-form Q successively come within his reach he gently pats the web with his hands to cause it to properly close and lay over the ends of said forms. This operation is a tedious one for the attendant, and is usually performed by boys, who frequently neglect their work, which results in the web being improperly laid on said forms, the consequence being wrinkles in some places and thin places in other parts of the hat-bodies.

The object of my improvement is to do away with the necessity of an attendant to each machine and to provide the mechanism hereinbefore described with attachments to automatically guide the web and cause it to properly wind and lay on the said body-forms Q.

In carrying out my improvement I erect between the doffer and the body-forms supporting and operating mechanism a tubular standard A', in which is supported and arranged to slide a rod B', sustained in position therein by a set-screw O, or in any other suitable manner. To the top of said rod B' is pivoted at p a vibratory guide C', which guides the web in its passage from the doffer to the body-forms Q and causes it to be properly wound and laid thereon. The said guide is formed of two bent rods q and r , the latter being pivoted at $s s$ to and within the former, so that it can be turned upward when it is desired to have access to the web between it and the doffer. The rod r , when down, as shown in Fig. 1, rests against stops $t t$, projecting inward

from the turned-up ends of the rod q . The said rod q is fixed to a plate u , the latter receiving the pivot p , passing through the top of the rod B', before mentioned. Another plate or eye v is fixed to the rod q , to which is pivoted a connecting-rod D', jointed at its lower end to the wrist x of a crank-gear E', the latter fixed to a journal which is supported and adapted to revolve in a standard F', said gear E' engaging with the pinion F, fixed to the shaft E, hereinbefore referred to. The said gear E' is of the same diameter and has the same number of teeth as the gear G, and it will be seen that the shaft E in revolving will, by means of the intervening mechanism connected to it, and hereinbefore described, simultaneously vibrate the body-form supporting and operating frame K, and also the web-guide C'.

The mechanism for causing the web to be properly laid or closed over the ends of the body-forms Q may be thus described. To the inclined shaft R, hereinbefore referred to, is applied a bevel-gear a' , which engages a bevel-gear b' , fixed to a vertical shaft c' , supported in bearings d' , fixed to the frame K. (See Figs. 1 and 3.) Secured to the upper end of the said shaft c' is a head or wheel e' , provided with studs $f' f'$, which, when said wheel revolves, operate with the hooked ends of two arms $g' g'$, (see Fig. 8,) said arms forming a part of the patter-operative mechanisms, one of said mechanisms being applied to each of the arms P of the body-forms supporting and operating mechanism, one of said arms P being pivoted on each side of the frame K; but the drawings represent only one patter and its mechanism, as each is a duplicate of the other. F² represents a frame secured to one of the said arms P, (see Figs. 1, 2, and 3, also Fig. 6,) in the upper ends of which is secured a tubular shaft h' , provided in its sides with slots $i' i'$, as shown. Within said tubular shaft h' is supported so as to slide therein a shaft k' , it being formed in two parts $k^2 k^3$, the former part k^2 having a reduced portion l^2 , which after passing through a sleeve m' enters a socket in the part k^3 , and is fixed thereto so that both parts $k^2 k^3$ will turn together as one shaft. Stud $n' n'$ extend through the slots $i' i'$ in the tubular shaft h' , and screw into the said sleeve m' . A spiral spring o' , encompassing the said shaft k' bears against the frame F² and the said studs $n' n'$, as shown in Fig. 7. An arm p' is loosely applied to the shaft k' , and is connected thereto by a set-screw q' , which screws through said arm and enters a long groove r' in said shaft k' , said connection permitting the shaft k' to slide longitudinally in the arm p' , but causing said shaft to turn transversely with said arm, the latter being prevented from longitudinal movements by a bearing s' , secured to the frame F² by a bolt t' . The arm p' is jointed to the slotted upper end of a lever u' , fulcrumed to the frame F² at v' . Fixed to the shaft k' is an arm w' ,

which supports the rod x' of what is termed the "patter," (shown at y'), it being connected to its rod by a ball-and-socket joint, as shown.

A spiral spring z' , encompassing the shaft and bearing at its ends against the arm w' and the socket fixed to the patter, allows the said patter to yield, so as to bear fairly on the surface against which it may be pressed. A collar a^2 is fixed to the rod x' by a set-screw, as shown, which admits of the distance of the patter from the arm w' being varied, if desired. A spring b^2 , fixed to the frame F^2 , bears against the lever u' and operates to keep said lever in a vertical position, or thereabout, when away from or out of contact with the stop Z , hereinafter referred to, and also holds the patter away from the end of the body-form Q when it is not required to pat the web. (See Fig. 3.)

An arm c^2 , pivoted at d^2 to the frame F^2 , (see Figs. 1 and 6,) is jointed at its upper end to one of the studs n' , and said arm c^2 is connected at e^2 to the arm g' , the free end of which is hooked, as hereinbefore mentioned and as shown in Fig. 8, to operate with the studs f' of the wheel e' . The other end of said arm g' is a spring g^3 , which bears against the frame F^2 and moves the hooked end of said arm when free to move into engagement with the said studs f' of the wheel e' , as hereinafter set forth.

The lever u' is provided with a prong u^2 , which bears against the arm g' and holds it, so that when said lever u' and the patter are in the position shown in full lines in Fig. 3 the hooked end of the said arm g' will be far enough away from the path of revolution of the said studs f' as not to be operated upon by them. A stop Z , fixed to the floor, (see Figs. 1, 2, and 3,) is arranged in the path of movement of the lower end of the lever u' , and when the latter is moved against said stop it (said lever u') is turned on its fulcrum, which also turns the arm p' and the shaft k' in their bearings, and carries the patter down at the proper time into the position shown in dotted lines in Fig. 3. At the time the lever u' is turned on its fulcrum by the stop Z the prong u^2 of said lever will pass under the arm g' and set it free, and the spring end g^3 of said arm will throw the hooked end of it into engagement with the studs f' and set the patter in motion as soon as it is swung down opposite the adjacent end of the body-form to operate against or pat the web on the said end of the body-form Q in essentially the same way that the hand of an attendant performs this part of the operation.

The operation of the mechanism for revolving and oscillating the body-forms Q and my improvements connected to said mechanism for automatically guiding and laying the web on said forms in the formation of the bodies of wool hats may be thus described. The carding-machine being put in motion, the belt C therefrom, passing around the pulley D , will revolve the shaft E , and the cones $M M'$ will

be put in operation by the intervening mechanism connecting it to said shaft E , such consisting of the bevel-gear U , fixed to said shaft E , the bevel-gear T , inclined shaft S , bevel-gear m , intermediate bevel-gear l' , gear l , inclined shaft R , and bevel-pinion k , the latter engaging the gear i , fixed to the said cone M , the gear j , fixed to the fellow cone M' , engaging the said gear i of the driven cone M . The frame K , supporting said cones $M M'$ and the cones $N N'$, will also be put in vibration in a horizontal plane by means of the pinion F , fixed to said shaft E , the crank-gear G , and connecting-rod H , the latter connecting the arm I , fixed to the frame K , to the crank-pin of the said gear G . The web-guide C' also has imparted to it the necessary oscillatory movements on its pivot p to cause the web in its passage from the doffer through said guide to pass to the body-forms Q and properly and automatically wind thereupon by the said shaft E , the said pinion F , crank-gear E' , and connecting-rod D' , the latter jointed to the web-guide and to the crank-pin x of the said gear E' . (See Figs. 1, 2, and 3.) The vertical shaft c' and its head e' will also be in continuous movement, the bevel-gear b' , fixed to said shaft, engaging the bevel-gear a' , fixed to the shaft R . (See Figs. 1, 2, and 3.)

The parts being in operation, as described, every time the frame K swings on its pivots the lower end of one of the levers u' will be carried against one of the stops Z , which will turn said lever u' on its fulcrum and cause the arm p' to turn the shaft k' in the tubular shaft h' and carry the patter y' down in front of the adjacent end of the body-form Q . Said movement of the lever u' will set free the arm g' from the prong u^2 of said lever, and the spring g^3 throws the hooked end of the arm g' into engagement with the studs $f' f'$ of the wheel e' , each half-revolution of the said wheel e' swinging the arm c^2 on its pivot, which slides the shaft k' in its supporting tubular shaft h' and carries the patter against the web on the adjacent end of the said body-form. The studs $n' n'$ during said movement of the patter compress the spring o' , which spring, the moment the hooked end of the arm g' is released from either of the said studs f' of the wheel e' , will expand and move the shaft k' in the opposite direction and carry the patter away from the said end of the body-form Q' . The patters will each be alternately reciprocated and caused to pat the web on the ends of the said form, while the hooked ends of the arms g' are successively moved into engagement with the said studs f' of the wheel e' ; but as soon as the levers u' are returned to a vertical position, or as soon as their lower ends cease to bear against the stops Z , the said hooked ends of the arms g' will be borne away from or out of engagement with said studs by the prong u^2 of said lever u' (shown in the drawings) and by the spring end of the arm g' , (partially

shown in dotted lines in Fig. 8,) the said spring end of said arm g' (shown in dotted lines) moving said arm in the opposite direction from what the spring end g^3 (shown in full lines in the drawings) moves its arm g' . The patter, owing to the way its slide-rod x' is supported in the arm w' and being connected to said slide-rod by a ball-and-socket joint, will, when in contact with the web covering the end of the body-form, adapt itself thereto in very much the same way that the hand of an attendant will when patting said web.

From the foregoing it will be seen that by my improvements the web will be automatically guided and laid on the body-forms in a suitable manner without requiring the constant aid of an attendant to guide it, the services of one being seldom ever required except to sever the covering of the form Q at its middle when it has attained the required weight and remove the two parts of said covering from said form, and also to properly apply the web to the said form to again wind thereon as before, a single attendant thus being able to oversee several machines.

What I claim is—

1. The web-guide C' , consisting of the bent rods q and r , pivoted to each other, the former provided with ears u and v and one or more stops t , substantially as shown and described.

2. The web-guide C' , the rod B' , to which it is pivoted, the standard supporting said rod, the latter adjustable vertically in the standard, the crank-gear E' , and the rod D' , connecting the crank of said gear to the guide, in combination with the pinion F and shaft E , substantially as shown.

3. The mechanism for automatically patting the web to cause it to properly lie over the ends of the body-forms, such consisting of the patter y' , the rod to which it is jointed,

the supporting-arm w' , the spring z' , said rod being adjustable longitudinally in said arm, the shaft k' , grooved at r' and provided with the sleeve m' , the tubular shaft h' , supporting shaft k' and provided with slots $i' i'$, the spring o' , stud n' , fixed to sleeve m' and arranged in the slots $i' i'$, the arm p' , applied to shaft k' , as explained, the lever u' , pivoted to said arm and provided with prong u^2 , the stop Z , the arms c^2 and g' , pivoted to each other, the latter hooked at one end and having a spring at the other end, the frame F^2 , supporting said mechanism, the wheel e' , having studs f' to operate arm g' , the shaft c' , and the bevel-gears b' and a' , the parts enumerated, except the stop Z , being arranged with and sustained by the oscillatory frame which supports the cones $M M' N N'$, and also are operated by the mechanism which gives motion to said frame, essentially as explained.

4. The combination, with a carding-machine and a body-form supporting and operating mechanism connected so as to operate together to form the bodies of wool-felt hats, boots, shoes, &c., of the automatic vibratory web-guide C' , adapted to guide the web from the doffer and cause it to properly wind on the said body-form, also the mechanism for automatically operating a patter for closing the said web against the ends of the said body-form, the said patter-operative mechanism being applied to and sustained by the frame of the body-form supporting and operating mechanism, substantially as described and represented.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN S. TAPLEY.

Witnesses:

S. N. PIPER,

WM. H. PRESTON.