

No. 806,204.

PATENTED DEC. 5, 1905.

E. STANSFIELD.  
PILE FABRIC CUTTING MACHINE.

APPLICATION FILED JUNE 18, 1902.

4 SHEETS—SHEET 1.

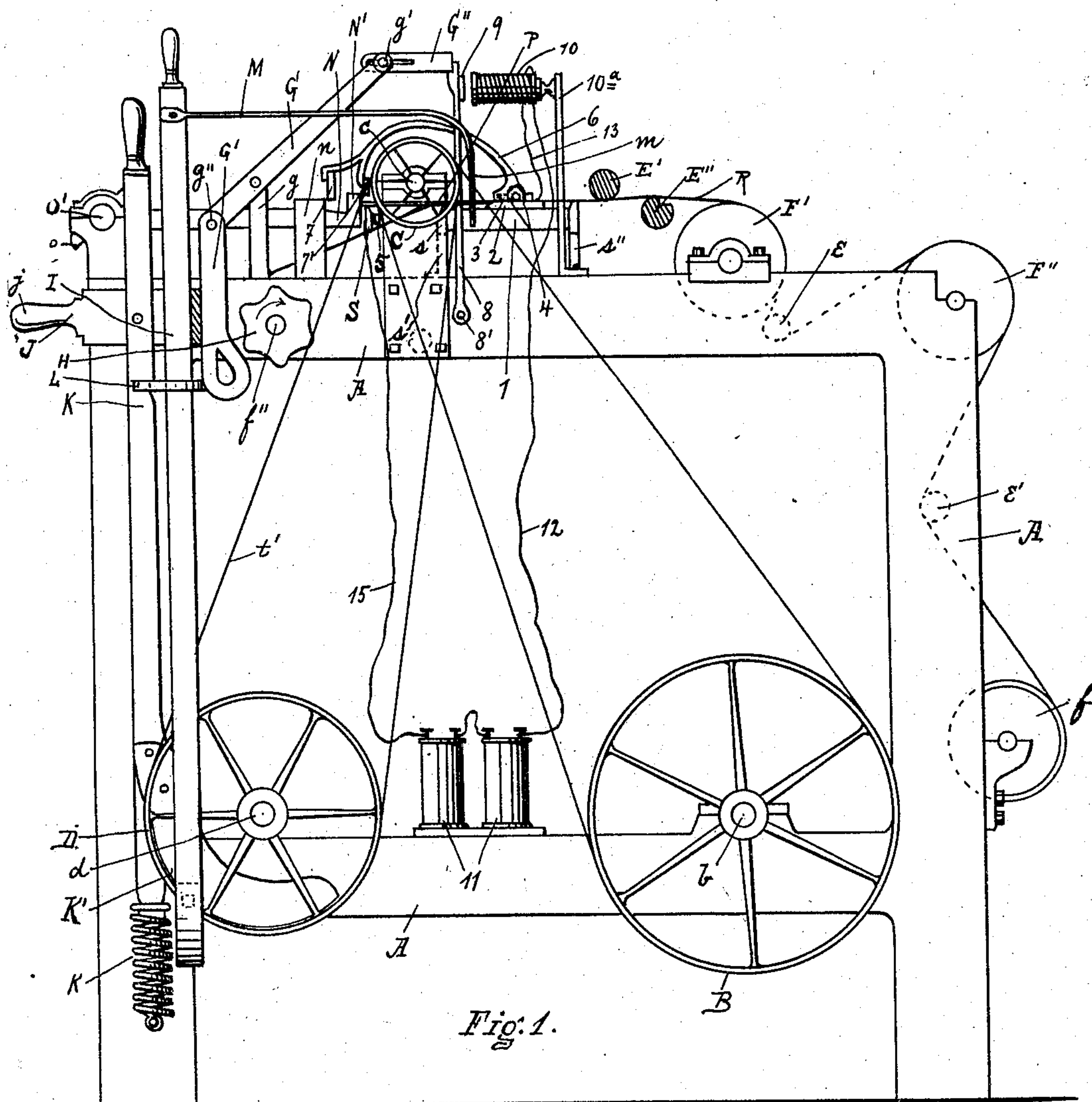


Fig. 1.

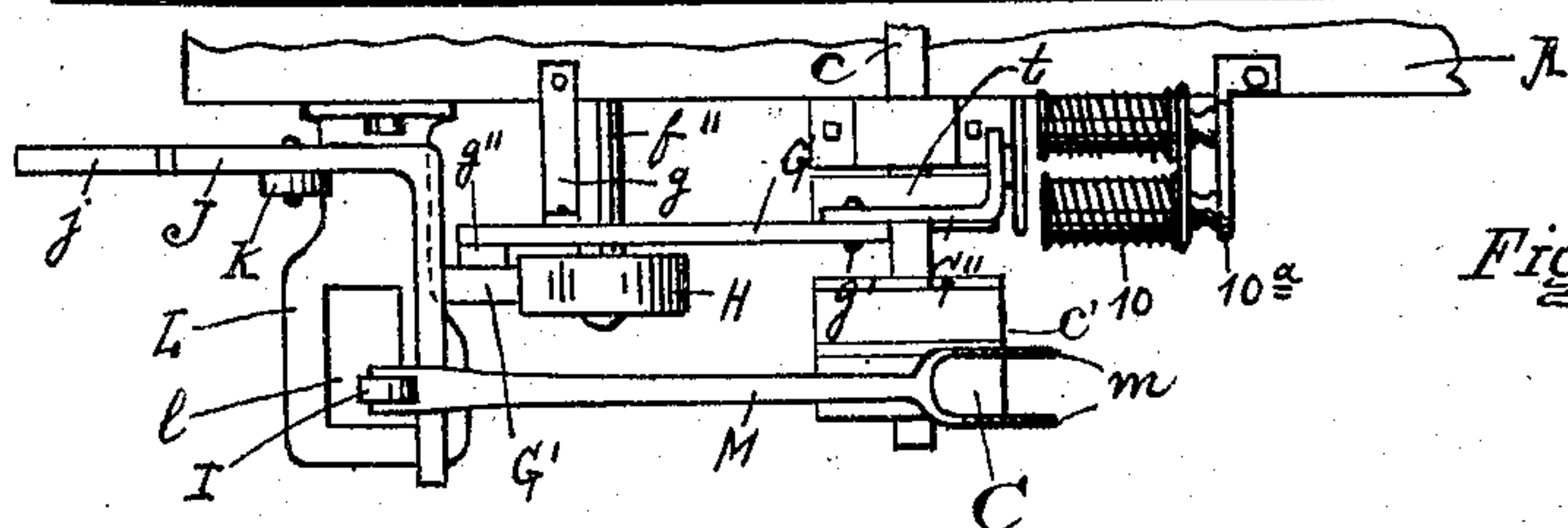


Fig. 2.

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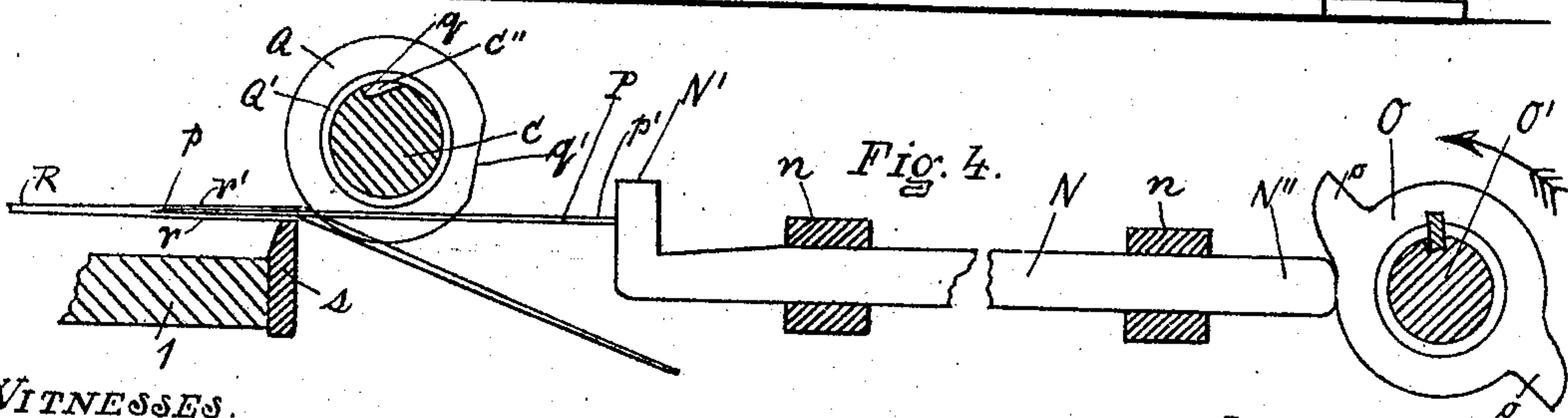
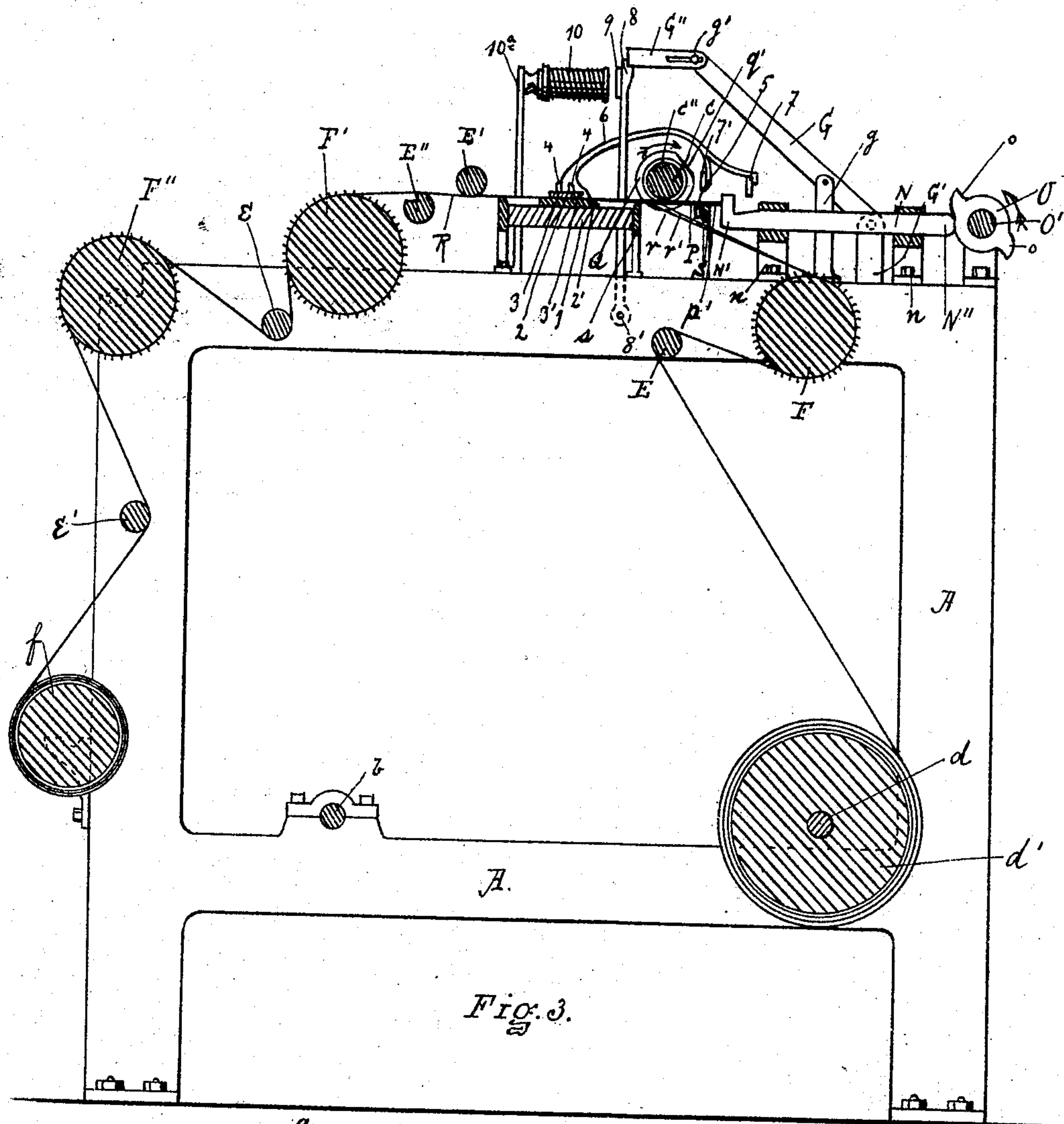
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4 SHEETS—SHEET 3.

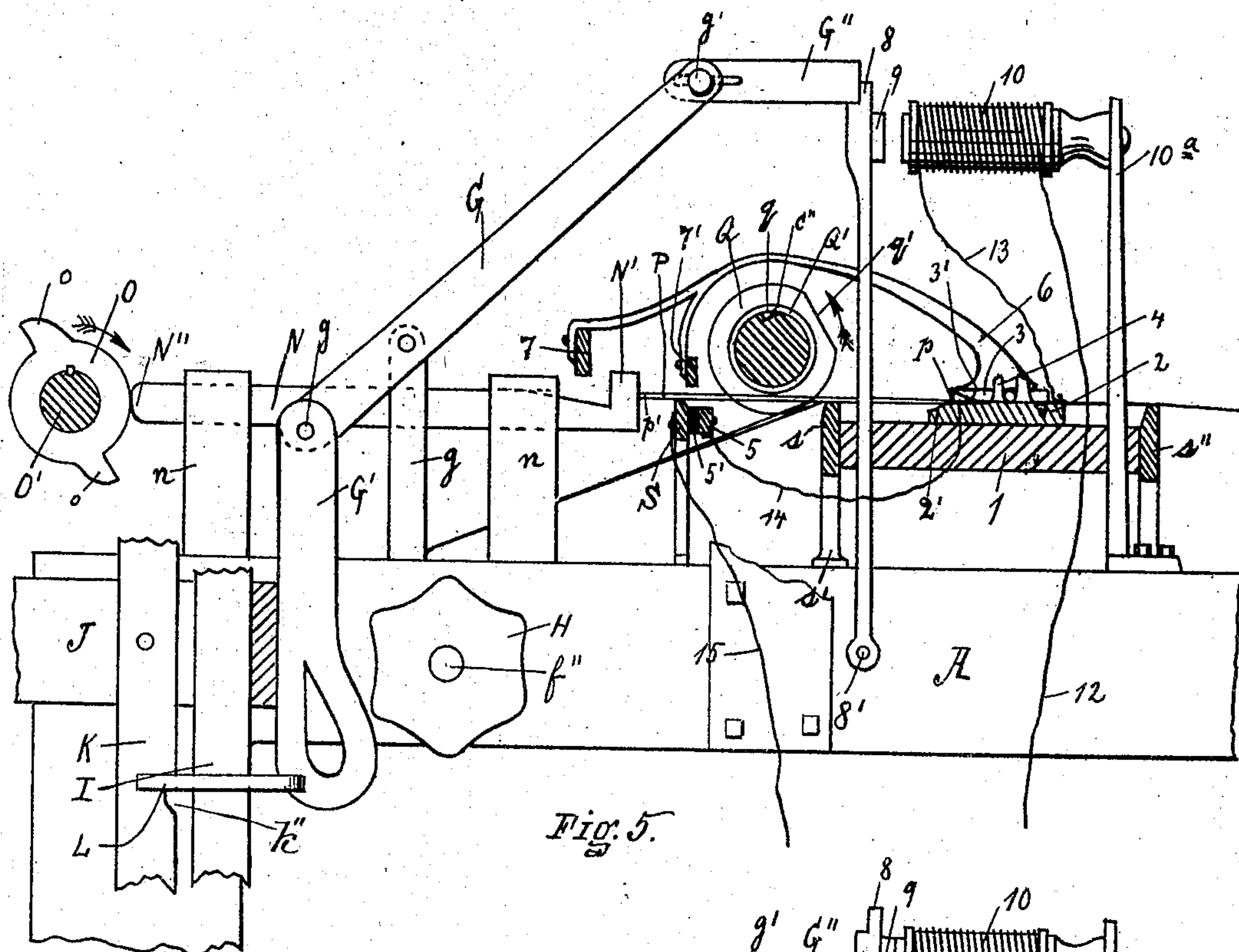


Fig. 5.

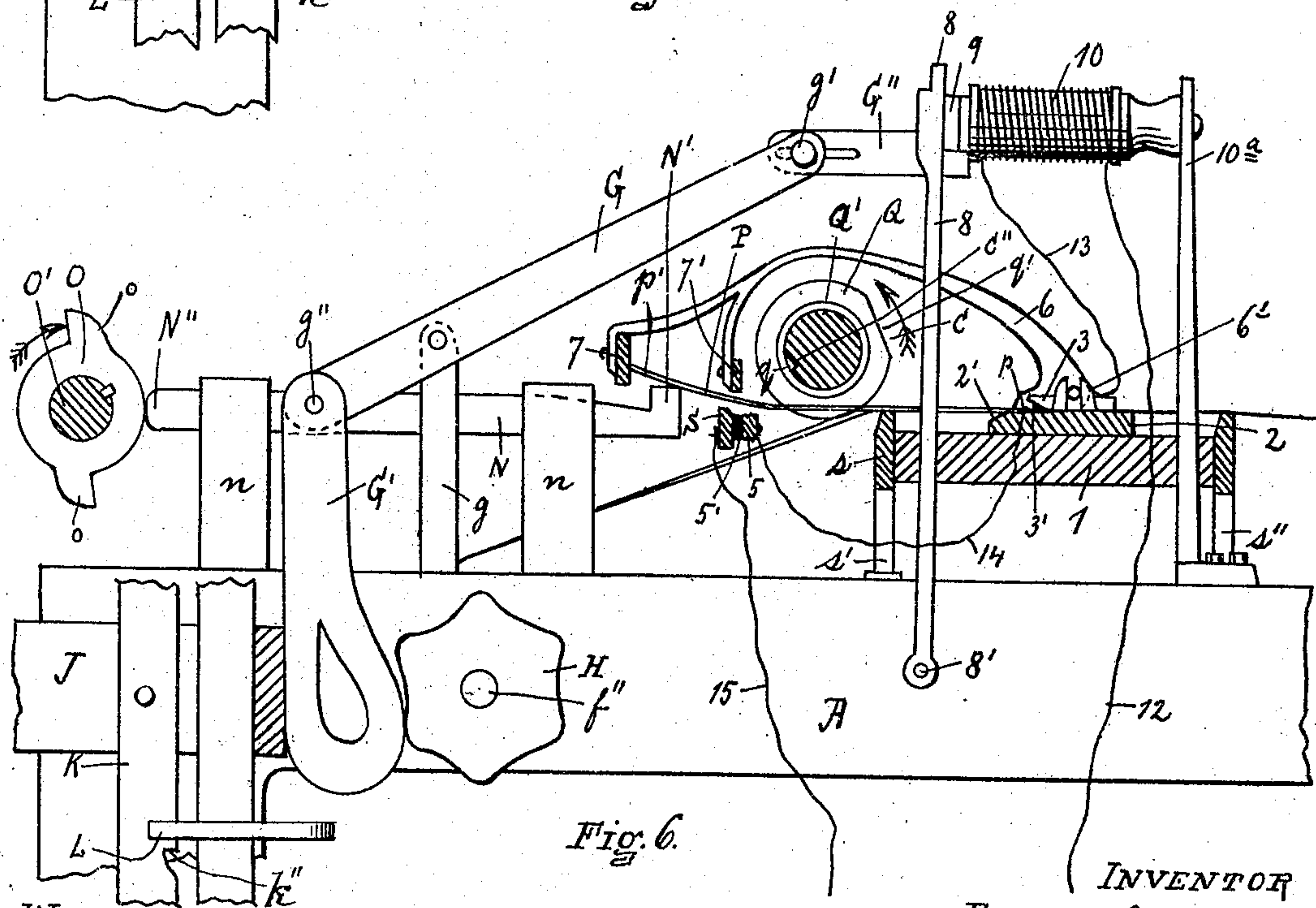


Fig. 6.

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4 SHEETS—SHEET 4.

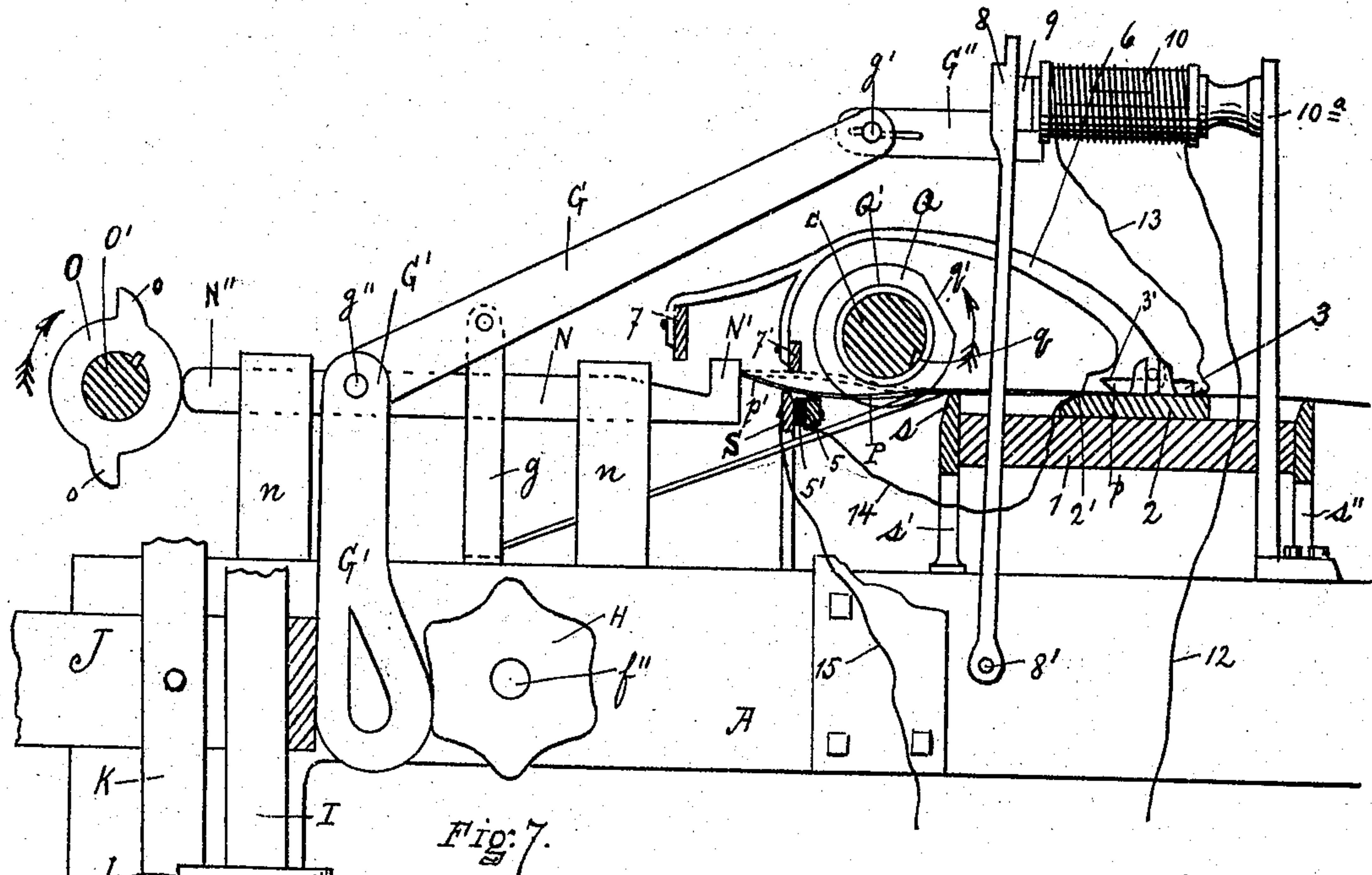


Fig. 7.

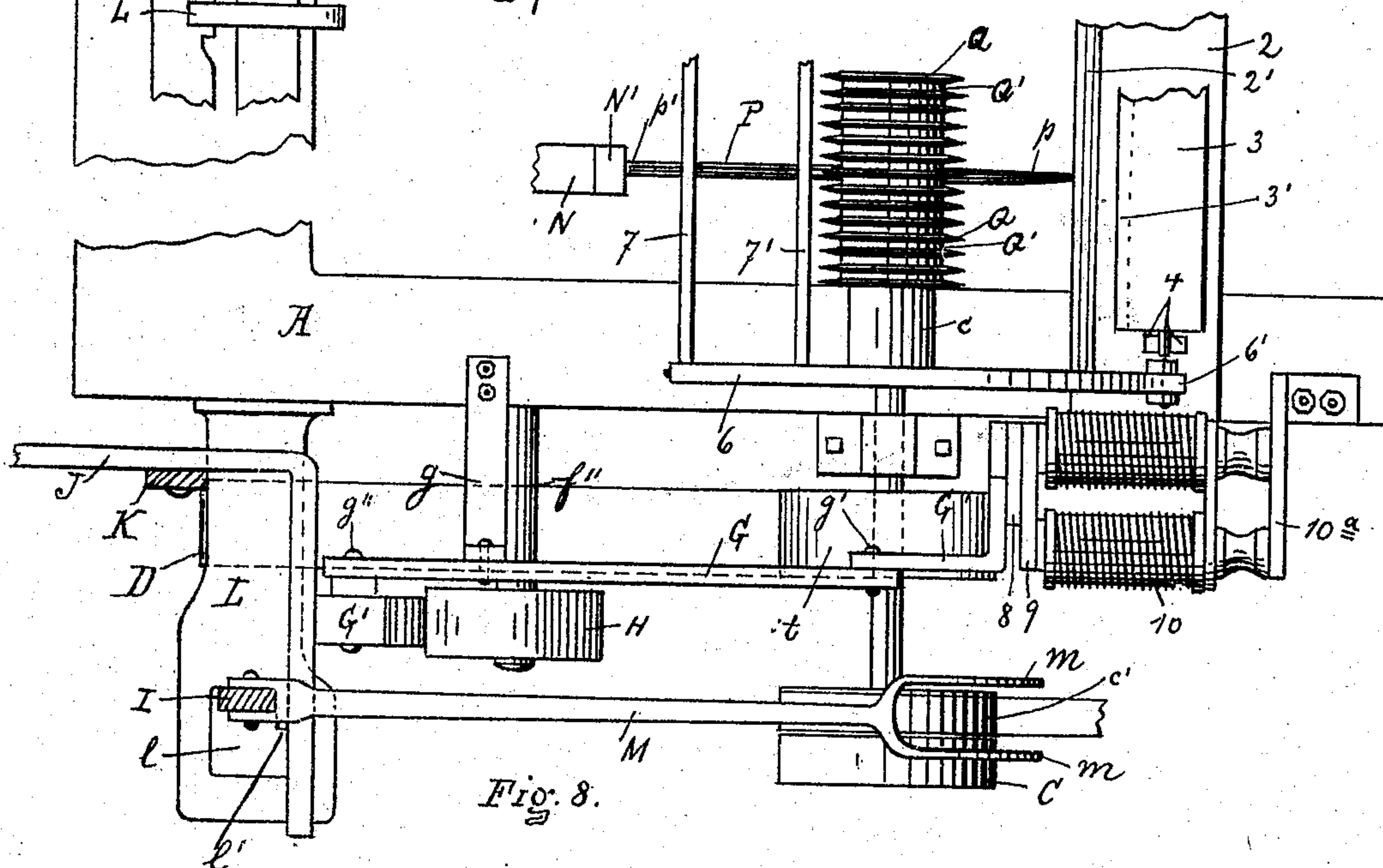


Fig. 8.

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# UNITED STATES PATENT OFFICE.

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## PILE-FABRIC-CUTTING MACHINE.

No. 806,204.

Specification of Letters Patent.

Patented Dec. 5, 1905.

Application filed June 18, 1902. Serial No. 112,162.

*To all whom it may concern:*

Be it known that I, EDWARD STANSFIELD, a citizen of Great Britain, residing at New York Mills, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Pile-Fabric-Cutting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to an improvement in machines which are used in the manufacture of pile fabrics—such as velvet, corduroy, &c.—for the cutting of the race or pile in the finishing of the product, my invention relating particularly to a stop-motion for such machines; and I declare that the following is a full, clear, concise, and exact description thereof, sufficient to enable any one skilled in the art to which it pertains to make, construct, and use the same, reference being had to the accompanying drawings, in which like letters and figures refer to like parts.

Figure 1 is a side view of such a machine with my improvement thereon, showing a portion in section. Fig. 2 is a plan view of a portion of the mechanism shown in Fig. 1. Fig. 3 is a section view from the side opposite to that shown in Fig. 1. Fig. 4 is a detail view of a portion of the mechanism shown in Fig. 3. Fig. 5 is a detail view of the upper portion of the machine, showing my improvement attached thereon and showing that part 6 which is on the farther side of the machine. Fig. 6 is a view similar to Fig. 5, showing a different position of part of the mechanism, as is also the case with Fig. 7. Fig. 8 is a plan view of a part of the machine with my improvement attached.

In the manufacture of goods, such as velvet and other pile fabrics, the cloth is made with what is called a "ground," on which are formed parallel ribs or races, which give a ridged appearance to the surface of the cloth, the portions of the material which are contained in the ribs being separated from the ground of the fabric and presenting something of a space between the rib and the body or ground. In manufacturing these classes of goods the rib which is thus formed is cut open, so that the ends of the threads are turned outwardly from the body of the cloth, forming the finished surface. This cutting is shown in the drawings as being done by circular knives, which are so adjusted in relation to

the cloth that as it passes thereunder they cut through the threads which form the ribs, but do not reach the ground of the cloth. The drawings also disclose what may be termed "guides," which are forced into the ribs and separate their threads from the ground of the cloth and through which guides the knives are designed to present their cutting edges to the ribs. It occurs from time to time that the guides in which these knives work are misdirected when they are thrust forward in the rib or pile of the fabric and pierce through the ground or the pile of the cloth, which condition must be remedied before the work can be properly continued.

The purpose of my device particularly is automatically to stop the machine whenever any one of the guides in which the knives play slips in any direction through the fabric or out of its proper place of action.

Referring to the figures more in detail, A represents the frame of such a machine as I have mentioned. On this machine is power-pulley B, which is suitably seated on power-shaft *b*.

C is a pulley carrying the belt from the power-pulley B and transmitting the power to the knife-shaft *c*, on which pulley C is seated. On the knife-shaft *c* is also seated an idle pulley *c'*.

D is what may be termed a "winding-pulley," to which power is transmitted from the knife-shaft by an ordinary pulley *t* and belt *t'*. This winding-pulley is seated on shaft *d* and carries the winding-drum *d'*, on which the cloth is received after it has been worked.

E, E', E'', *e*, and *e'* are turn-bars which are seated on the frame A, either fixedly or pivotally, as required, and whose office is to give sufficient tension to the cloth while passing under the knives.

F, F', F'', and *f* are winding-cylinders which are provided with pins on their surface for holding the cloth as it passes over them, with the exception, however, of the cylinder *f*, on which the cloth is first placed when it is brought to the machine. These are severally operated by proper mechanism, which is not shown in the drawings, but which, with other ordinary parts, any mechanic can readily supply and adjust.

G is a stop-arm which is pivotally supported on standard *g* upon the frame A. One end of this stop-arm bears a slotted stop-fin-



ger  $G''$ , adjustably secured thereto by the bolt  $g'$ . From the other end of the stop-arm hangs loosely on the pivot  $g''$  the stop-bar  $G'$ , which is enlarged at its lower end for the reasons hereinafter shown. The stop-arm  $G$  is so supported that when the stop-finger is released from its support that end will fall and the end which supports the stop-bar will rise.

$H$  is a lug pinion or wheel with an irregular periphery, which is seated on shaft  $f''$ , which is revolved by proper operating mechanism to the right as it appears in Fig. 1.  $I$  is a shifting-lever which is secured at its lower end to the frame in such manner that the upper end tends to press laterally toward the frame of the machine. When the parts are set, it is held outwardly by engagement in the notch  $l'$  in plate  $L$ . When released by the action of the stop-bar  $G'$ , it flies to the inner end of the opening in plate  $L$ .

$J$  is a contact-arm having a handle  $j$  and which extends from the front of the machine at the left in Fig. 1 toward the rear parallel with the frame and then projects at a right angle outwardly from the frame, as shown particularly in Fig. 2. Attached to this arm is a brake-bar  $K$ , which is seated on coil-spring  $k$ , attached to the frame. It carries at its lower end the brake  $K'$ , which is adapted to engage and stop the winding-pulley  $D$ . It is notched near its upper end at  $k''$  to rest on plate  $L$  when the brake is away from wheel  $D$ .

$L$  is a side plate secured to the frame  $A$  and projecting therefrom laterally and horizontally, and it is provided with an open space  $l$ , in which there is a step or notch  $l'$ .

$M$  is a shifting-arm with fingers  $m m$ , which is fixedly attached to the upper end of the shifting-lever  $I$ . By means of this shifting-arm the driving-belt is slipped on the idle pulley from the driver, or vice versa.

When the stop-finger  $G''$  is released from the support which holds it up, that end of the stop-arm  $G$  drops downwardly and the stop-bar  $G'$  rises, so as to be wedged between the contact-arm  $J$ , where it is bent outwardly, and the lug-pinion  $H$ . As the lug-pinion turns its edge crowds against the enlarged portion of the stop-bar  $G'$ , which results in crowding the contact-arm and handle forwardly. The contact-arm being between the stop-bar and the shifting-lever, the same interference pushes the shifting-lever forward, and it escapes from the notch  $l'$  in the side of the plate  $L$ , which held it outwardly from the frame of the machine, so that the shifting-lever flies toward the frame of the machine and carries with it the shifting-arm  $M$  and fingers  $m m$ , thereby passing the belt from the driver to the idle pulley. The same forward movement of the contact-arm pushes forward the brake-bar  $K$  from its engagement on plate  $L$  and brings the brake  $K'$

against the winding-pulley  $D$  under the tension of the spring  $k$  on the brake-bar.

$N$  is a series of thrust-bars which are carried in the supports  $n n$ , in which they are permitted to slide back and forth freely. At one end they are rounded, as at  $N''$ , and at the other end  $N'$  they are headed or upset.

$O$  is a spur-wheel having spurs  $o o$  and which is keyed or splined on spur-shaft  $O'$  and which is actuated by proper mechanism. There are a suitable number of such spur-wheels.

Represents knife-guides which are formed, roughly speaking, of a doubled wire, forming two prongs. At butt  $p'$  the prongs or ends of the wire are connected, leaving a narrow space between the portions of the wire forming the sides of the guide. From that point the wire extends forward, being brought closer together as it approaches the forward end and being fashioned and polished suitably to travel freely in the rib of the fabric. The knife-guides may be formed of steel, the two ribs or side portions of the doubled wire being easily separable by their elasticity to admit the circular knife. In operation the thrust-bars  $N$  are pushed forward by the spurs of the spur-wheels, each spur-wheel pushing one or more thrust-bars, the spurs being set at different angular positions, so that, for the convenience of the operator, the thrust-bars and knife-guides move one after another, or in sets, and not all at once. This also avoids too great tension of the threads of the rib. The thrust-bars are so wide at the head as to cover and push one or more of the knife-guides. When the thrust-bar is pushed forward by the revolution of the spur-wheel, its headed end strikes the butt of the knife-guides that are opposite to it and pushes the forward end of these knife-guides onward in the rib of the cloth  $R$  between the ground  $r$  and the threads which form the pile or race  $r'$ . The cloth in its passage under the knives brings back the knife-guides, which also return the thrust-bars, until the spur again comes in contact with the butt of the thrust-bars, when the guides are again advanced in the ribs. The knives revolving against the direction of the cloth and having their cutting edges confined between the prongs of the knife-guides are confined to cutting each the rib which is brought beneath it by the action of its knife-guide.

$Q$  represents the knives, of which there are a sufficient number seated on the knife-shaft  $c$ . They are here shown as circular rotary, but may be of any suitable form and operation. The knife-shaft  $c$  where it carries the knives is of a convenient diameter and has a longitudinal groove  $c''$  in that part which carries the knives. Each knife has a corresponding tooth  $q$  on its inner periphery, so that as the knife-shaft revolves the knives are carried with it, but are not held against side movement,



but are free to move laterally and follow the line of the knife-guides. A segment is cut off each knife, thus permitting the convenient insertion in the knife-guide, this being necessary from the fact that the lower edge of the knives are somewhat below the line of the knife-guides to prevent either the knife or guide getting out of place.

Q' represents rings loosely riding on the knife-shaft, keeping the knives properly separated. The knife-guides are supported horizontally near the butt by the guide-bar S and toward their other end, and just beyond the knife they are supported on turn-bars, which is so disposed as to change the direction of the cloth, keeping the ground away from the knives. The arrangement and operation of these parts are such that the knife-guide raises the threads of the rib above the ground and holds them toward the knife, while at the same time it guides the knife, so that it cuts in the center of the rib and is unable to get out of place, and the ground of the fabric is carried away from the knives. The guide-bar and the turn-bar are suitably supported at each end by the frame A.

In operation it sometimes happens that the knife-guides P become displaced as they rest on the guide-bar and on the cloth turn-bar. Sometimes the point of the knife-guide pierces the rib, which results in the knife failing to cut the threads, as they are thus brought below the knife-guide and follow the ground or body of the cloth as it turns somewhat sharply over the cloth guide-bar or turn-bar s. Sometimes the point of the knife-guide pierces the body or ground of the cloth when that part of the cloth is brought underneath the knives and more than the rib or race threads are cut. Sometimes, too, the butt of a knife-guide will slip out of contact with the opposite head N' of the thrust-bars, as is illustrated in Fig. 6, when of course the knife-guide ceases to do its work. It may also happen that the knife-guide be bent downwardly or upwardly, as illustrated in Fig. 7, when it also fails to do its work. Any of these displacements of the knife-guides should be remedied at once, and it is for the purpose of facilitating this and preventing any damage to the cloth by the improper operation of the machine that I employ the parts hereinafter described.

1 is a base-board supported suitably on standards s' and s'', which are seated on frame A. On this base-board I secure a copper or other electrically-conductive base-plate, which extends horizontally from one side of the machine to the other and over which the fabric passes on its way to the knives. This plate is indicated by 2, and at its front edge it may be beveled downwardly, as shown at 2'. On the base-plate I provide a top plate 3, the front edge of which may be beveled upwardly, as shown at 3'. This top plate is held in place by ears extending there-

from and which lie between the lugs 4 on the base-plate, so that there is at all times contact through the lugs and ears between the upper and lower plates. This upper plate rests upon the cloth as it is fed to the knives.

Upon a convenient support 10<sup>a</sup>, which is secured to the frame A, I place the electromagnet 10, and at some convenient place on the machine I locate a battery, as shown at 11. From one side of the battery I extend wire 12 to the electromagnet and from there (shown by 13) to the base-plate 2. From the other side of the battery I extend a wire 15 to the guide-bar S.

Upon the frame A, I pivotally seat at 8' a stop-finger support 8, which is shown in Fig. 5 as holding up the stop-finger G''. In Fig. 6 these parts are shown after the stop-finger support has been withdrawn. Upon the top of this stop-finger support I secure armature 9, which is disposed opposite to the electromagnet.

When the point of the knife-guide slips upwardly or downwardly from its place in the rib, it strikes base-plate 2 or top plate 3. Being supported on the guide-bar S, the moment the point of the knife-guide strikes either the top plate or base-plate the electromagnet is excited, so as to attract the armature 9 on the stop-finger support, which then permits the stop-arm G to swing and brings the lower end of the stop-bar G' between the contact-arm J and the lug-pinion H, the result of which has already been explained as stopping the machinery. If it should happen that the knife-guide which is displaced does not rest upon the guide-bar S, still other knife-guides rest thereon, and the electric current is carried from the guide-bar through the other knife-guides and knives and knife-shaft to the displaced knife-guide, so that the displacing of any single knife-guide, as shown, instantaneously stops the machine.

To provide for other displacements of the knife-guides, I attach to the guide-bar S, by means of properly-insulated bolts passing through slots in the connected parts and having nuts thereon, a construction well known and understood by those skilled in the art, a metallic or other electrically-conductive strip 5, which is separated from the guide-bar by insulation 5'. From this strip I pass a wire 14 to the base-plate 2. The upper edge of the strip 5 is slightly lower than the upper edge of the guide-bar S. In case the knife-guide is displaced, as shown in Fig. 7, it is crowded by very little displacement into the position there shown in full lines, the result of which is to complete the circuit and attract the stop-finger support to the electromagnet, and thus stop the machine. The same result follows even if the knife-guide is crowded off guide-bar S, the current passing through other knife-guides, as above described.

It sometimes occurs that a knife-guide bends



upwardly, as shown by the dotted lines in Fig. 7, or that its butt flies by the opposed head end N' of the thrust-bar, as in Fig. 6.

For such a case I provide the following parts:

5 At the end of the base-plate 2 is a bracket 6, which is pivoted on the base-plate at 6'. A bracket is shown at each end of the base-plate. They are pivoted so that they and their parts can be turned up and back out of the way  
10 when the operator wishes to get at the knives and the adjacent parts. These brackets extend forwardly over the knives and terminate in two arms, which carry the adjustable strips 7 and 7', which are of electrically-conductive  
15 material, as are also the brackets. The adjustment is by means of bolts and nuts passing through slots in the connected parts. The strips 7 and 7' extend from one side of the machine to the other.

20 In case the knife-guide is bent upwardly, as shown by the dotted lines in Fig. 7, it comes in contact with the strip 7' and the electric current is carried, as before, from the guide-bar through knife-guides, which rest  
25 upon it, through the knives and the displaced knife-guide to the strip 7', so that the circuit is completed and the stop-finger support then withdrawn. In case the butt of the knife-guide slips over head N', as shown in Fig. 6,  
30 it will instantly strike the strip 7, when the circuit will be completed in the manner described and the mechanism be brought to a stop.

By means of the parts and the arrangement  
35 of the parts which I have shown and which may be suitably located, adjusted, and duplicated I have surrounded the knife-guides with a series of guards which will instantly detect any displacement of any of the knife-guides, so  
40 that the instant any such displacement occurs the machine will be brought to a stand and the knife-guide may be restored to its proper place.

I do not limit myself to the construction as  
45 illustrated, as changes and modifications may be made in the device without departing from the spirit of my invention.

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

1. In a machine of the character described, a base-plate, a top plate in electric contact therewith, the plates being adapted to permit the interpassage of the cloth to the knives,  
55 knives, a stop-finger support, an armature thereon, knife-guides and an electric circuit adapted to be completed on contact of a knife-guide with the base or the top plate, in combination, substantially as set forth.

60 2. In a machine of the character described, knife-guides, a guide-bar supporting the knife-guides, an electrically-conductive strip supported on the guide-bar and insulated therefrom, electrically-conductive plates con-  
65 nected to pass an electric current and adapted

to permit interpassage of cloth to the knives, knives, an electric connection between the strip and the plates, an electromagnet, a stop-finger support oppositely disposed thereto and provided with an armature oppositely disposed  
70 to the electromagnet, and a battery with connections between it, the guide-bar and through the electromagnet to the base-plate whereby the circuit is completed on contact of a knife-guide with the electrically-conductive strip,  
75 in combination, substantially as set forth.

3. In a machine of the character described, an electrically-conductive base-plate, a bracket pivotally seated thereon terminating in arms, strips supported by the arms, the bracket,  
80 arms and strips being electrically conductive, a guide-bar supporting the knife-guides, knife-guides, an electromagnet, a stop-finger support provided with an armature oppositely disposed to the electromagnet, a battery, elec-  
85 trical connection between the battery, the electromagnet, the base-plate, the arms and the guide-bar whereby the electric circuit is completed on contact of a knife-guide with  
90 either of the bracket-supported strips, in combination, substantially as set forth.

4. In a machine for cutting the pile of a fabric, the combination of a shaft, a series of rotary cutting-knives mounted on said shaft, a series of knife-guides constructed with flexible  
95 ribs, one being on each side of each knife and united before and behind each knife, mechanism for moving the knife-guides forward in the pile of the fabric, a metal plate mounted to rest on the surface of the pile of the fabric  
100 and engage the knife-guides when the same pierce the pile of the fabric, an electric battery, an electromagnet electrically connected to the plate and to the battery whereby when  
105 one or more of the knife-guides project through the fabric into contact with the metal plate the circuit is established and the mechanism connected therewith for automatically  
110 arresting the movement of the fabric is put in operation, and mechanism adapted to stop the machine on completion of the circuit, substantially as set forth.

5. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides constructed to run in the pile of the fabric, and in which the knives rotate, a metal plate supported on the fabric, an open electric circuit, whereby when one or more of the knife-guides is brought in contact with the metal  
120 plate the electric circuit is established, a magnet, an armature connected with the stop-motion within the field of the magnet for automatically arresting the movement of the fabric when the electric connection is established  
125 and a stop-motion, substantially as set forth.

6. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides between which the knives rotate constructed to  
130



run in the pile of the fabric and in contact with the knives, an electrically-conductive knife-guide-supporting bar, an insulated electrically-conductive strip located slightly below the level of the knife-guides, an electromagnet electrically connected to the supporting-bar and to the said insulated strip, an armature connected to the stop mechanism on the machine and within the field of the electromagnet for arresting the movement of the fabric when the knife-guide comes in contact with the insulated strip and electric connection is established thereby, and stop mechanism, substantially as set forth.

7. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides between which the knives rotate constructed to run in the pile of the fabric and in contact with the knives, an adjustable insulated metal strip located slightly below the level of the knife-guides, an electromagnet electrically connected to the insulated metal strip and to an electric circuit, said electric circuit, an armature connected to the stop mechanism of the machine and within the field of the electromagnet for automatically arresting the movement of the fabric when a knife-guide comes in contact with the insulated metal strip and electric connection is established thereby, and stop mechanism, substantially as set forth.

8. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides between and in contact with which the knives rotate constructed to run in the pile of the fabric, a metal strip located above the knife-guides, an electromagnet electrically connected to the strip and an electric circuit, said electric circuit, an armature in the field of the magnet, which actuates the stop-motion for arresting the movement of the fabric when one or more of the knife-guides are brought in contact with the metal strip whereby the movement of the fabric is automatically arrested, and a stop-motion, substantially as set forth.

9. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides between and in contact with which the knives rotate constructed to run in the pile of the fabric, a metal strip located above the knife-guides, an electric circuit, an electromagnet electrically connected to the strip and in said electric circuit, connected to actuate the stop-motion and a stop-motion for arresting the movement of the fabric when one or more of the knife-guides are brought in contact with the metal strip whereby the movement of the fabric is automatically arrested, substantially as set forth.

10. In a machine for cutting the pile of a fabric, the combination of a series of rotary

cutting-knives, a series of metal knife-guides between and in contact with which the knives rotate constructed to run in the pile of the fabric, a metal strip located above and to the rear of the knife-guides, an electromagnet electrically connected to the metal strip and to an open electric circuit whereby when the rear or heel portion of one or more of the metal knife-guides are brought in contact with the metal strip an electric circuit is established, a stop-motion, said electric circuit and an armature connected to the stop-motion and within the field of the electromagnet whereby the movement of the fabric is automatically arrested when the electric circuit is established, substantially as set forth.

11. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides between and in contact with which the knives rotate constructed to run in the pile of the fabric, an adjustable metal strip located above and to the rear of the knife-guides, an electromagnet electrically connected to the adjustable metal strip and to an open electric circuit whereby when the rear or heel portion of one or more of the metal knife-guides are brought in contact with the adjustable metal strip an electric circuit is established, said electric circuit, a stop-motion and an armature connected to the stop-motion and within the field of the magnet whereby the movement of the fabric is automatically arrested when the electric circuit is established, substantially as set forth.

12. In a machine for cutting the pile of a fabric, a series of cutting-knives, a series of guides adapted laterally to limit the cutting-knives and in contact therewith and constructed to advance with the operation of the machine in the pile of the fabric, electrically-conductive strips and plates mounted adjustably on electrically-conductive supports adjacent to the knife-guides in their operation, said supports, a stop-motion mechanism provided with an armature, an electromagnet disposed opposite to the stop-motion armature, an open electric circuit connecting the adjustable strips and plates whereby the electric circuit is established on contact of one or more of the knife-guides with one or more of the metallic strips or plates, and the operation of the machine is suspended, in combination, substantially as shown.

13. In a machine for cutting the pile of a fabric, a series of cutting-knives, a series of guides adapted laterally to limit and guide the cutting-knives and in contact therewith and constructed to advance with the operation of the machine in the pile of the fabric, metallic strips or plates located to engage with any knife-guide upon its displacement, a stop-motion provided with an armature, an electromagnet disposed opposite to the stop-motion armature, an open electric circuit connecting



the strips or plates whereby the electric circuit is established on contact by one or more of the knife-guides with one or more of the metallic electrically-connected strips or plates, combined substantially as set forth.

14. In a machine of the character described provided with knives and knife-guides, electrically-conductive plates adjacent to the fabric and to the knife-guides, an electrically-operative stop mechanism, an electric circuit adapted on contact of a knife-guide with a plate to operate the stop mechanism, in combination, substantially as described.

15. In a machine of the character described provided with electrically-conductive knives and knife-guides, an electrically-conductive guide-bar supporting the knife-guides, an open electric circuit connected thereto, electrically-conductive plates adjacent to the knife-guides and connected with the circuit, and a stop-motion adapted to stop the machine on contact between a knife-guide and a plate, in combination, substantially as described.

16. In a machine of the character described, knife-guides, a guide-bar supporting the knife-guides, an electrically-conductive strip supported on the guide-bar and insulated therefrom, knives, an electromagnet, a stop-finger support provided with an armature oppositely disposed to the electromagnet, and a battery with connections between it, the guide-bar and through the electromagnet to the strip whereby the circuit is completed on contact of a knife-guide with the electrically-conductive strip, in combination, substantially as set forth.

17. In a machine of the character described provided with electrically-conductive knives, knife-guides and a guide-supporting bar, an electrically-conductive insulated strip adjacent to the knife-guides, an electrically-operative stop mechanism, an open electric circuit embracing the guide-supporting bar and the insulated strip and electrically actuating the stop mechanism upon the completion of the electric circuit on contact of a knife-guide with the insulated strip, thus stopping the machine, in combination, substantially as described.

18. In a machine of the character described, knives, knife-guides, a guide-supporting bar, an insulated strip adjacent to the knife-guides, the said parts being electrically conductive, an electrically-operated stop mechanism and an open electric circuit embracing the said parts and completed on contact of a knife-guide with the insulated strip to operate the stop mechanism, in combination, substantially as shown.

19. In a machine of the character described provided with knives and knife-guides, bracket-supported strips adjacent to the knife-guides, brackets, the said parts being electrically conductive, an electrically-operative stop mechanism, electrical connections embracing

the knife-guides and the strips whereby the stop mechanism is operated on contact of a knife-guide with either of the strips, in combination, substantially as described.

20. In a machine for cutting the pile of a fabric, the combination of a shaft, a series of rotary cutting-knives mounted on said shaft, a series of knife-guides constructed with a rib in contact with each face of its knife and united before and behind each knife, mechanism for moving the knife-guides forward in the pile of the fabric, a metal plate adjacent to the fabric and adapted to engage the knife-guides when the same pierce the pile of the fabric, an electric battery, an electromagnet electrically connected to the plate and to the battery whereby when one or more of the knife-guides project through the fabric into contact with the metal plate the circuit is established and the mechanism connected therewith for automatically arresting the movement of the fabric is put in operation, mechanism adapted to stop the machine on completion of the circuit, substantially as set forth.

21. In a machine for cutting the pile of a fabric, the combination of a series of rotary cutting-knives, a series of metal knife-guides constructed to run in the pile of the fabric and in which the knives rotate, a metal plate adjacent to the fabric, an electromagnet connected to the metal plate and adapted to receive an electric current whereby when one or more of the knife-guides is brought in contact with the metal plate the electric circuit is established, said electric circuit, an armature connected with the stop-motion for automatically arresting the movement of the fabric when the electric connection is established and a stop-motion, substantially as set forth.

22. In a machine of the character described provided with knives, knife-guides and knife-guide-supporting means, the said parts being electrically conductive, electrically-conductive strips or plates located to engage with any knife-guide upon its displacement, an electrically-operative stop mechanism, an open electric circuit embracing such parts adapted to be completed on contact of any knife-guide with any of said strips or plates to operate the stop mechanism, in combination, substantially as described.

23. In a machine of the character described, provided with electrically-conductive knives, knife-guides and knife-guide-supporting bar, an open electric circuit connected thereto, electrically-conductive strips supported adjacent to the knife-guides and a stop-motion whereby on contact of a knife-guide with a strip the circuit is completed and the stop-motion is operated, substantially as described.

24. In a machine of the character described comprising cutting members and electrically-conductive guiding means normally operative to feed material to the cutting members, an



open electric circuit comprising a magnet, a stop mechanism comprising an armature mounted in the field of the magnet, electrically-conductive members disposed adjacent to said guiding means whereby on contact between the latter and the former the circuit is closed and the stop mechanism is operated, substantially as described.

25. In a machine of the character described provided with knives and knife-guides, electrically-conductive members adjacent to the knife-guides, an electrically-operative stop mechanism, an electric circuit adapted on contact of a knife-guide with any of said members to operate the stop mechanism, substantially as described.

26. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode and means actuated by the closing of said circuit for stopping the machine, substantially as described.

27. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, a companion electrode with which said guide will contact to close the circuit when said guide is diverted from its normal position, and means actuated by the closing of said circuit for stopping the machine, substantially as described.

28. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, a companion electrode with which said guide will contact to close the circuit when said guide is diverted from its normal position, and means actuated by the closing of said circuit for disconnecting the power which drives the machine and operating a brake mechanism, substantially as described.

29. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, a companion electrode with which said guide will contact to close the circuit when said guide is diverted from its normal position, and means actuated by the closing of said circuit for simultaneously disconnecting the power which drives the machine and operating a brake mechanism, substantially as described.

30. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide

as an electrode, and a companion electrode arranged near the rear of said guide and in a position where the rear end of said guide, if diverted from its normal position, will contact therewith and close said circuit, substantially as described.

31. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, and a companion electrode arranged near the rear end of the guide and in a position where the rear end of the guide, if bent or sprung downward, will contact therewith and close said circuit, substantially as described.

32. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, a companion electrode with which said guide will contact to close said circuit when said guide is diverted from its normal position, tight and loose pulleys, a belt-shipper held under tension to hold the belt on the tight pulley, and means actuated by the closing of said electric circuit to release said belt-shipper and permit it to shift the belt on the loose pulley, substantially as described.

33. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, a companion electrode with which said guide will contact to close the circuit when said guide is diverted from its normal position, a spring-actuated brake held out of action while the machine is in operation, and means actuated by the closing of said electric circuit for releasing said brake and permitting it to act, substantially as described.

34. In a pile-cutting machine, the combination of a guide which enters a race of the cloth, an electric circuit which includes said guide as an electrode, and a companion electrode arranged above the cloth and in position where the point of the guide, if projected through the face of the cloth, will contact therewith and close the circuit, said companion electrode being hinged so that it may be turned to facilitate the insertion of the cloth in the machine, substantially as described.

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

EDWARD STANSFIELD.

Witnesses:

ELEANOR T. DE GIORGI,  
GRACE C. ELLIS.