

Sheet 1-2, Sheets.

W. H. Palmer, Jr.
Making Cord.

N^o: 84,506.

Patented Dec. 1, 1868.

Fig. 1.

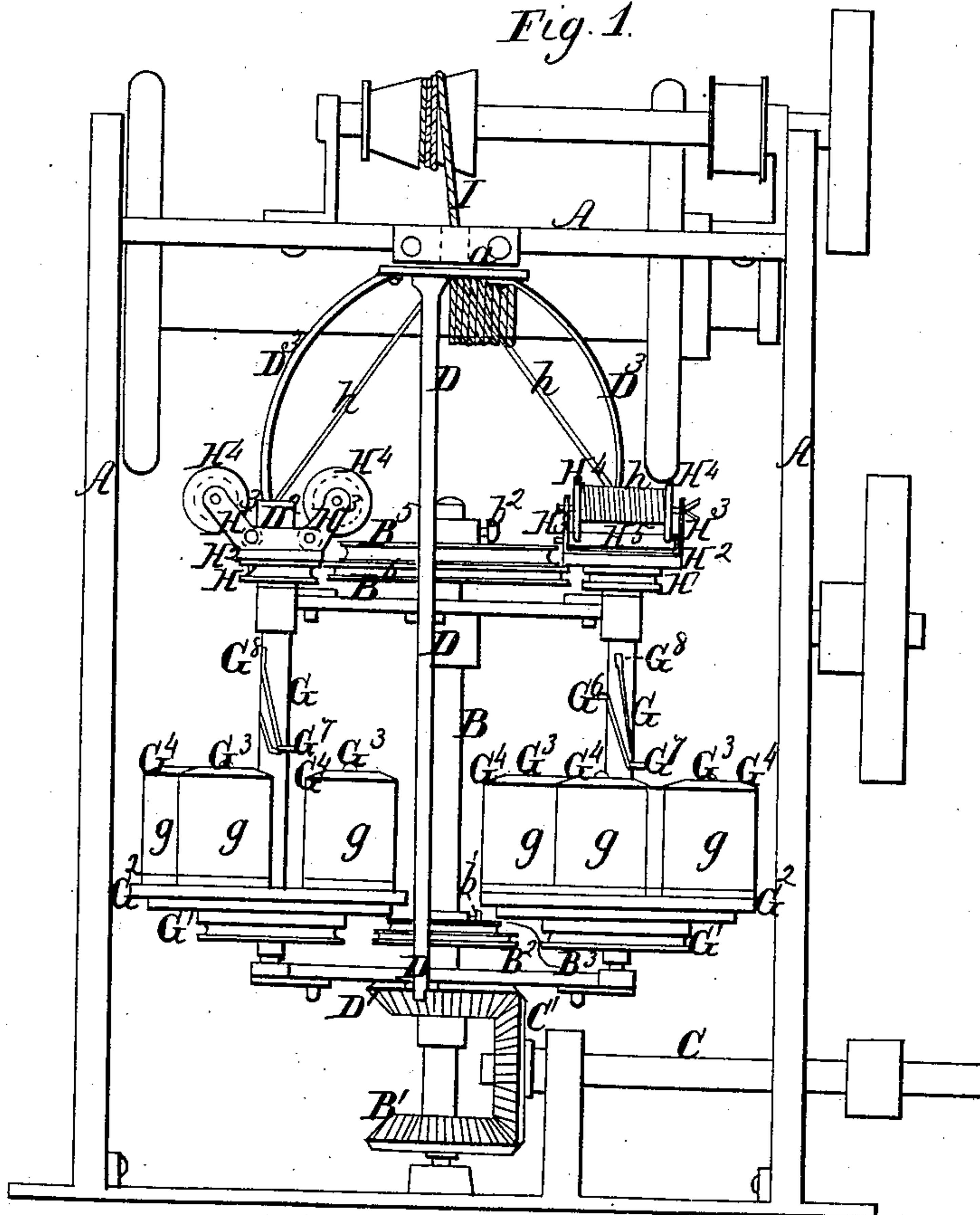
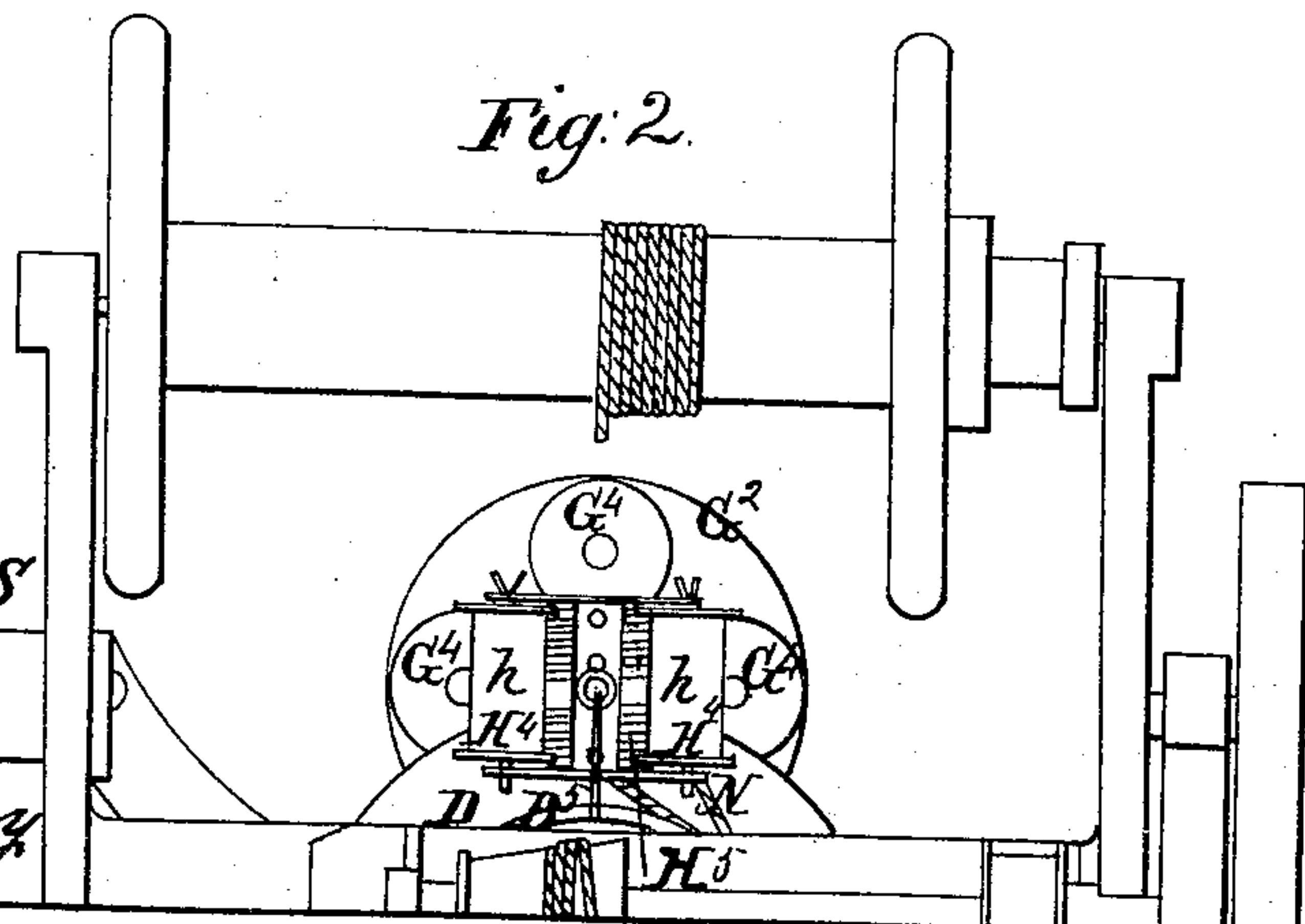


Fig. 2.



Witnesses

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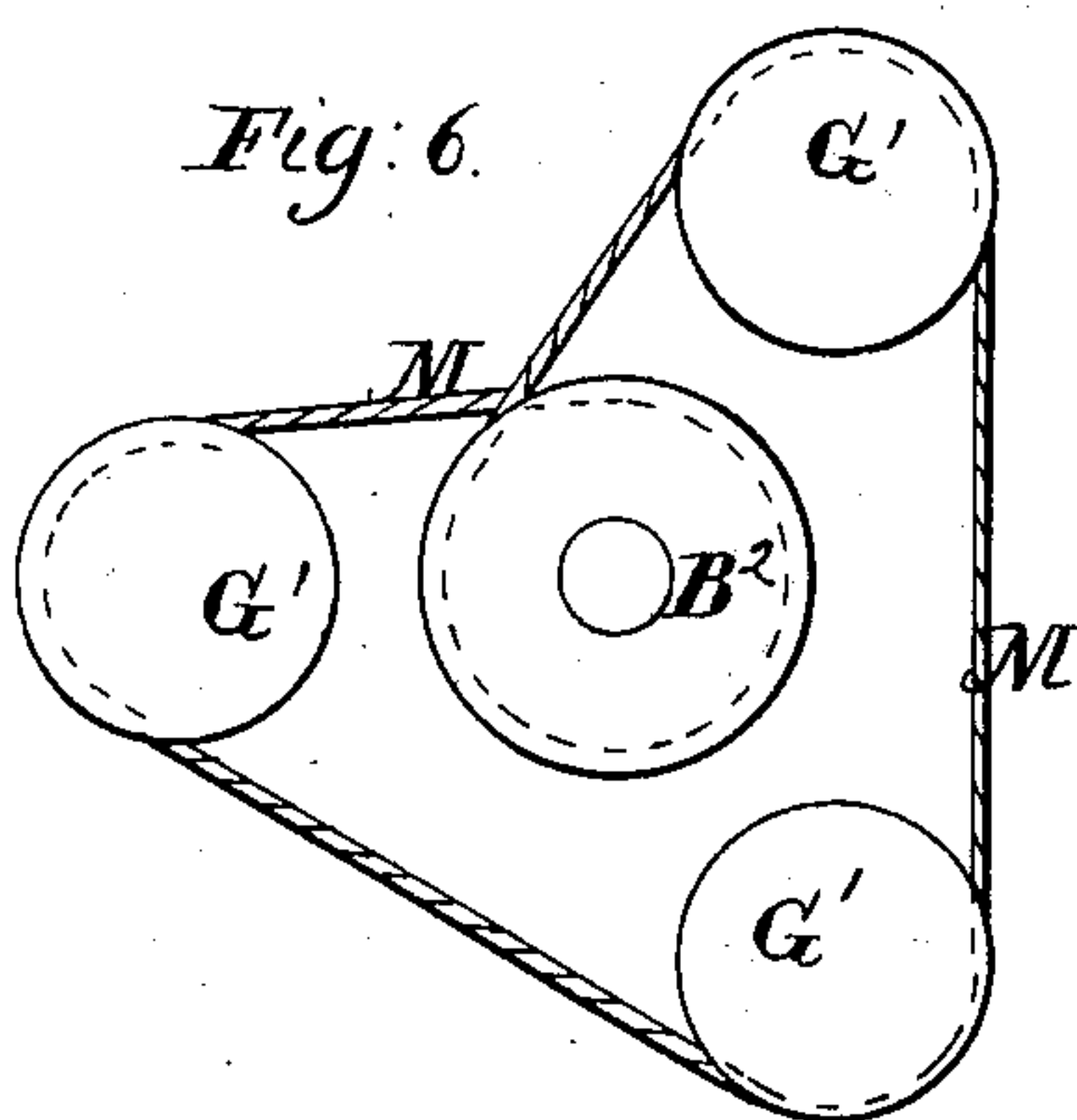
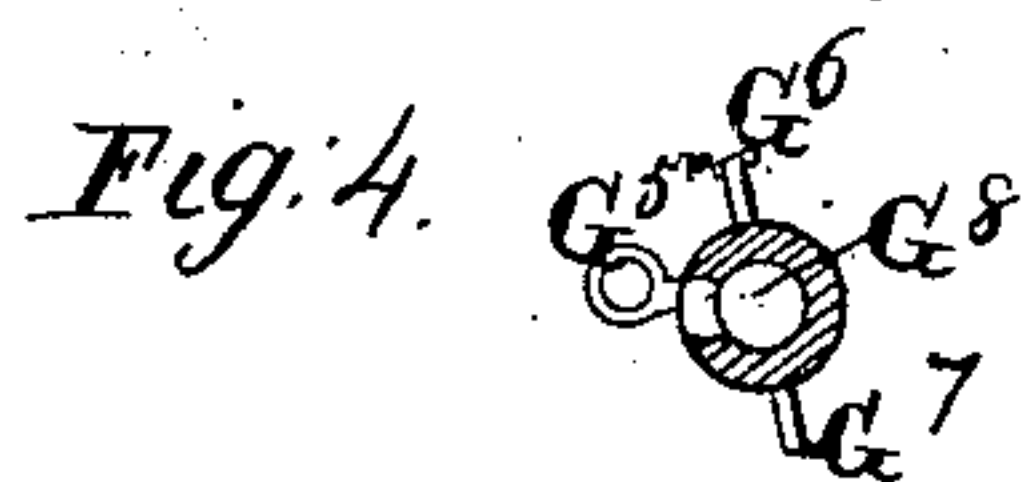
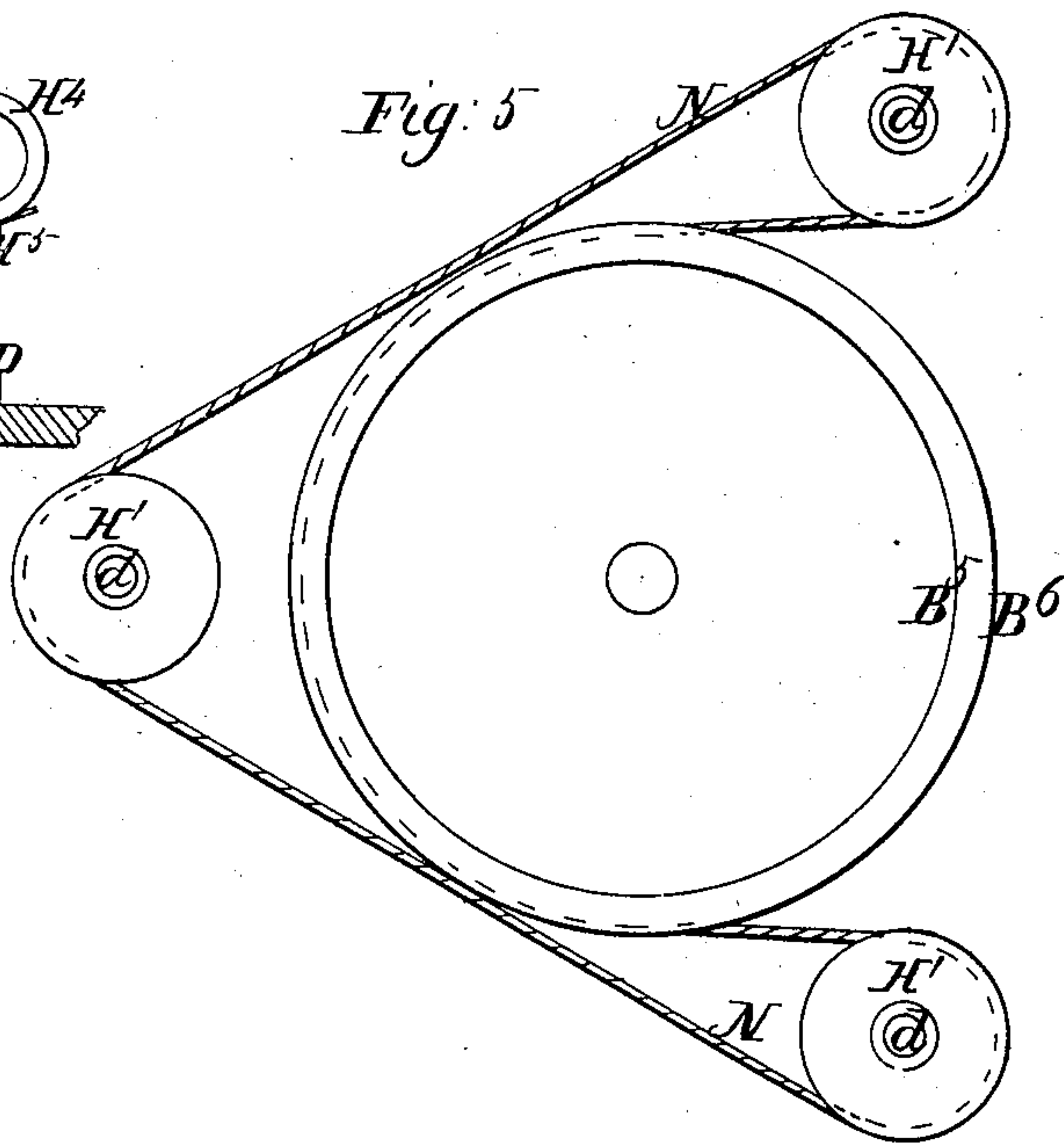
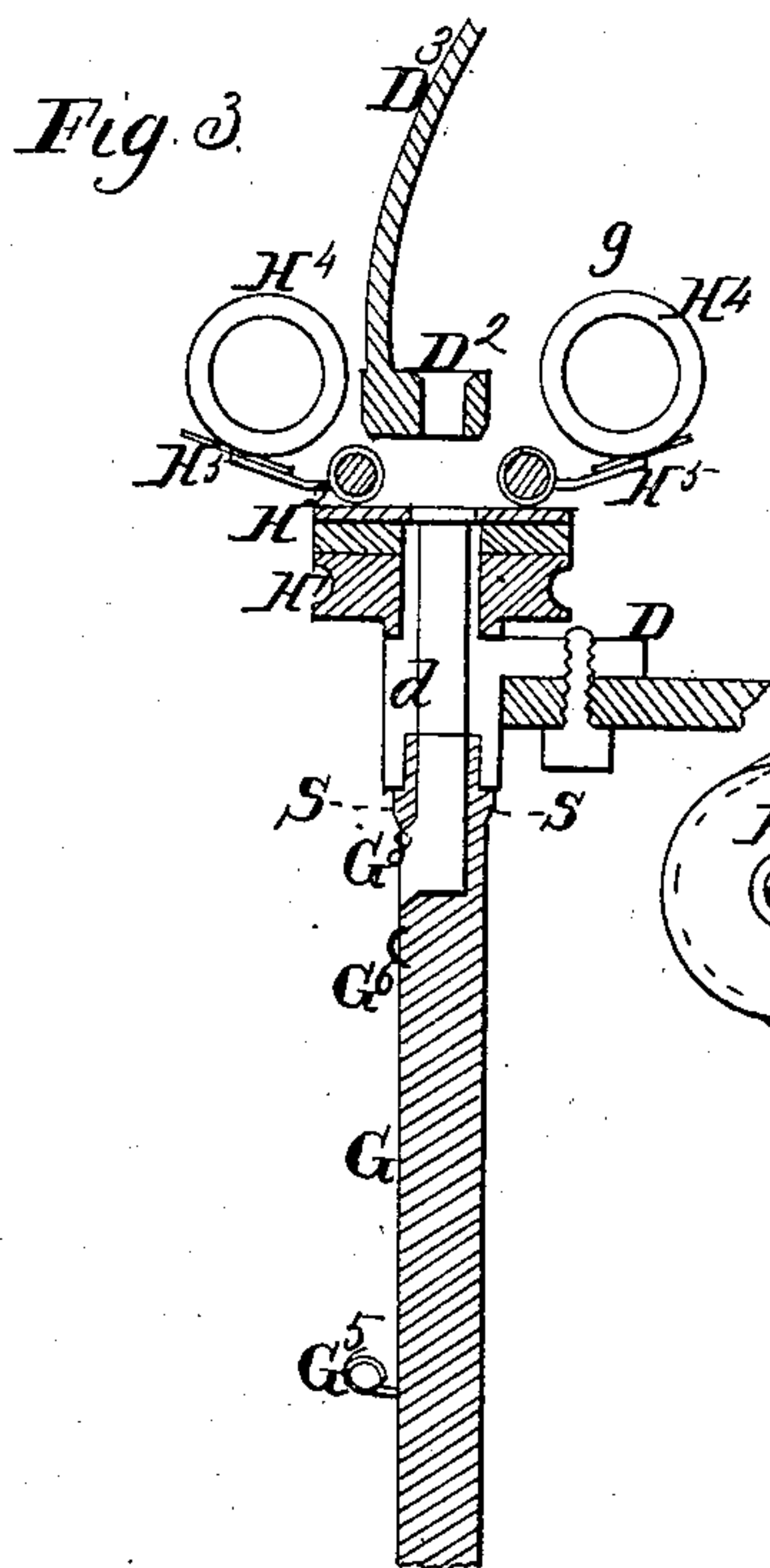
Wm H Palmer Jr
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Sheet 2-2 Sheets.

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United States Patent Office.

WILLIAM H. PALMER, JR., OF MIDDLETOWN, CONNECTICUT.

Letters Patent No. 84,506, dated December 1, 1868.

IMPROVEMENT IN CORD-COVERING MACHINE.

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

To all whom it may concern:

Be it known that I, WILLIAM H. PALMER, JR., of Middletown, in the county of Middlesex, in the State of Connecticut, have invented certain new and useful Improvements in Machines for Manufacturing Cord, Gimp, &c.; and I do hereby declare that the following is a full and exact description thereof.

My invention is more especially intended for the manufacture of picture-cord, and the like, or ornamental cord, in which the strands are wound or served with silk or worsted, to impart an ornamental finish; but parts of my invention may be used with success in the manufacture of gimp; so covered, by which I mean single strands, not twisted or held together, and also in the manufacture of cords, composed of twisted or laid strands not covered.

I will first proceed to describe what I consider the best means of carrying out my invention, and will afterwards designate the points which I believe to be new.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of the machine complete;

Figure 2 is a plan view of a portion of the machine;

Figure 3 is a vertical section, through a portion, on a larger scale;

Figure 4 is a longitudinal section on the line S S in fig. 3;

Figure 5 is a plan view of the belt and pulleys, which drive the covering-mechanism; and

Figure 6 is a corresponding view of the belt and pulleys which drive the cord-mechanism.

Similar letters of reference indicate like parts in all the figures.

The drawings represent the novel parts, with so much of the other parts as is necessary to indicate their relation thereto.

Tints are employed mainly to aid in distinguishing parts, and do not indicate material.

The material of the entire machine may be iron and steel.

The fibrous material employed may be of any color.

It is usual to employ a coarse and unattractive material, as hemp, jute, or the like, for the inner material of each strand, and brilliantly-colored material, as scarlet, or blue silk, or worsted, for the covering-material.

A is the frame-work, made of cast-iron, or other suitable material, and, adapted to support the several parts firmly, and providing suitable bearings for the journals.

B is an upright shaft, stepped in the frame-work A, at the bottom, and extending upward more than half way to the top of the machine, carries a bevel gear-wheel, B¹, which receives a constant rotatory motion from a corresponding bevel-gear wheel, C¹, on the driving-shaft C, which latter is impelled by a steam-

engine, or other suitable power, through a belt or other connection not represented.

D is a frame-work, adapted to carry the bobbins and other main parts of the mechanism to be described hereafter. To it is fixed the bevel-gear wheel D¹, which meshes also into the driving-gear wheel C¹, so as to impart a rotatory motion to the frame-work D, in a direction opposite to that of the interior shaft B. The weight of the revolving frame-work D, and its connections, rests on collars on the internal shaft B, and it is steadied entirely thereby.

At the top it is sustained in a bearing on the frame-work A, this bearing being formed at the point *a*, where a lay-block is introduced into the interior of the bearing, through which the strands issue, and are laid together with a proper twist.

It will be understood that by this arrangement, the internal shaft B and its connections, and the frame-work D and its connections, revolve in opposite directions. The mechanism above mentioned for taking away and reeling the cord as fast as it is produced, is of the ordinary character, and need not be specially described.

G G, &c., are upright shafts, mounted in the frame-work D, and made hollow at their upper ends, as represented. They carry, near their lower ends, pulleys G¹, which are expanded or widened on their upper sides, as indicated at G², and carry skewers, G³, on which are fixed the bobbins, G⁴, on which is wound the material, *g*, for the interior of each strand. This material *g* forms the body or main substance of each strand of the cord, gimp, or whatever is being manufactured. This material, *g*, is led from the spools G⁴, through the eye G⁵, up over the hook or peg G⁶, down again and partially around the shaft G, to pass under the hook or peg G⁷, thence upward through and in the hole G⁸, into the hollow interior of the upper end of the shaft G.

It will be understood that the friction of the spools or bobbins G⁴, and the friction induced by the passage of the material, *g*, through the guide, and around the pegs, as represented, induces a sufficient resistance to give a proper tension or draught of the material as it is drawn off in the manufacture of a cord.

A hole is made in the frame-work D, directly in line with the centre of each spindle G, of sufficient size to allow the material, *g*, to be led upward through it to be covered above, as will be presently described.

The central upright shaft B carries two pulleys, of different sizes, B² and B³. These are made in a single piece, and fixed on the shaft B by means of the pinching-screw b¹, so that they may be adjusted up and down as required. These pulleys impart a rotatory motion in the same direction to the several pulleys G¹ and their connections, by means of the belt M arranged thereon, as represented. This belt may be changed from the pulley B² to the pulley B³ at pleasure, and in such case the pulleys B² and B³ are moved

upward or downward on the shaft B, slackening the screw b^1 before the movement is effected, and tightening it afterwards.

The slackening of the belt M, by changing it from the larger pulley B^2 to the smaller pulley B^3 , may be compensated for by any of the ordinary approved means, for example, by the use of one or more tightening-pulleys, at suitable points on the belt M, or by providing a corresponding change of pulleys in place of the single pulley G^1 here represented.

I will now describe the mechanism for covering the strands.

The most remarkable peculiarity of this mechanism lies in the fact that it lays the covering-material in a spiral opposite to that of the internal material or core g . A hollow stud, d , is extended upward from the frame-work D, directly in line with and forming a continuation of the hole through which the strand g is drawn upward, on which stud is mounted a horizontal pulley, H^1 , which is extended on its upper face, as indicated by H^2 . From this upper face extend upward the ears H^3 , which carry the horizontal bobbins or spools H^4 , on which is wound the silk or other material for the covering h .

H^5 are friction-pieces, which press by the force of coiled springs, as represented, against the surface of the fibrous materials on the bobbin H^4 , and thus produce a proper and very nearly constant draught or tension on the covering-material.

I have found two bobbins, H^4 , of covering-material, for each strand, to be sufficient, and to give a very nicely-finished appearance to the cord, but more can be used, if desired, or one can be used alone, if preferred for any reason.

D^2 D^2 D^2 are guides, or eyes, fixed on the frame-work D, by means of the curved arms D^3 , as represented.

Each strand, after being coiled, is led upward through these eyes, and is drawn from thence directly to the lay-block, as represented.

It will be observed that the position of each eye D^2 is so low between the bobbins that the covering-material hugs closely against the under side of the eye, traversing continuously around the smooth under edge thereof. This arrangement gives an open construction to the parts, which is not attainable with the revolving eyes with limited holes therein, previously employed for analogous purposes, and is much less liable to clog with loose fibres, and involves much less difficulty in inserting the yarns. It also avoids all difficulties, heretofore experienced, in consequence of accidental variations in the sizes of the yarn, or occasional bunches therein.

As each strand is drawn upward with regularity, and the several parts revolve uniformly, it follows that the covering-material is wound on the core or interior material g with mathematical uniformity, like the threads of a screw, and the tension and other points being properly regulated, (as is easily done by those familiar with the manufacture of this kind of cord,) the product, or finally-finished cord I, produced by the proper applying together above the lay-block of the severally-covered strands, is superior in uniformity of appearance, and in the smoothness of its exterior, to the cord produced by ordinary means.

The increased tightness with which the material may be twisted and laid together, is due in part to the fact that the covering-material is wound in a spiral opposite to the spiral of the core in each strand, which allows my cord to present a much more glossy appearance than is presented by ordinary covered cord.

The pulleys H^1 are driven by a belt, N, arranged as represented, on the pulleys B^2 B^3 . These latter differ in size, as represented, but are both larger than the pulleys B^2 B^3 , before described, and the pulleys H^1 are smaller than the pulleys G^1 . It follows, therefore, that the covering-material h is wound on with a considerably

more rapid rotatory motion than the twisting of the cord-material g . This condition is ordinarily required, but it may be varied, as required, in the manufacture of thin cord, gimp, &c.

The velocity of rotation of the covering-pulleys H^1 , and their connections, may be varied in the same manner as before described for varying the twisting of the core-material, that is to say, by changing the belt M from the pulley B^2 to the pulley B^3 , or *vice versa*, correspondingly loosening and tightening the pinching-screw b^2 to effect it.

I can increase the number of the different-sized pulleys B^2 B^3 ; also, the number of the other set of pulleys, B^2 B^3 , so as to employ three or more different sizes, instead of two, at each of these points.

I can increase the number of the skewers G^3 , and thus vary the number of yarns in each of the strands, as may be required.

Many other variations of the details may be made, with a corresponding change in the effect, but which will be so obvious to those skilled in the art as to require no special description.

It may be proper, however, to state, (because it pertains directly to some of the features which I believe to be novel in this machine,) that the core-material g may be hooked on to or liberated from the several pegs G^4 G^5 at pleasure, as may be required, to increase or reduce the tension or draught on each strand. I propose, where the tension is not sufficient with two of these hooks, as represented, to increase the number, as may be required.

Some of the benefits of my invention may be realized by the employment of some of the novel features of my machine without the others. For example, I attach much importance to the employment of the belts M and N, arranged as represented, for communicating the motion from the internal shaft B, and its connections, to the pulleys which twist and lay the covering-material of the several strands; but I can easily dispense with the belt M, and impart the motion from the central shaft to the covering-pulleys by gearing, or by simple rolling-contact, or the friction of suitable wheels, grooved or otherwise, rolling one against the other, and in such case I should dispense with the special advantage due to the peculiar arrangement of my belt M, but should retain a great part of the advantages due to the obtaining of the motion from a centrally-located shaft, revolving in a direction opposite to that of the frame-work D.

By the two sets or systems of bobbins, G^4 and H^4 , revolving in opposite directions, and the several covered strands thus formed being afterwards laid together, as represented, the slight untwisting of the core of each strand, which results from the twisting together of the strands to form the final cord, is rendered available to increase the tightness with which the covering-material h is confined, and consequently to increase the smoothness of the product.

I attach considerable importance, practically, to the bands M and N, arranged and operating as represented, because, by these peculiar arrangements, not, as I believe, before known in this class of mechanism, I am able to communicate the motion more strongly than usual, and without risk of fracture.

My hooks, or pegs, G^5 G^6 , arranged as represented in the strand-twisting mechanism, allow me to vary the draught within wide limits, by causing the strand to make more or less abrupt bends. This is a species of resistance which is less liable to be affected by changes in the moisture of the atmosphere, and the like accidental causes, than the winding of a strand around a spindle, as has been heretofore practised. It also allows the draught to be altered at will, without cutting the strand, as is required to increase or diminish the number of turns around a spindle.

The fact that the spools carrying the covering-ma-

terial k are mounted with their axes in a plane at right angles to the axis of motion, instead of parallel thereto, as represented, allows me, while mounting the covering-eye D^4 very low, to draw the strand therefrom at the great angle represented, and avoid a necessity for extending it a great way up, and thus making the machine of inconvenient dimensions.

This arrangement also insures a greater uniformity in the manner in which the covering-material is applied, because, if the bobbins stood upright, or parallel to the axis of rotation, the stuff, drawn first from one end and then from the other of each bobbin, would not hug with the same invariable force against the eye D^4 .

Having now fully described my invention,

What I claim as new, as an improvement in machines for manufacturing cord and gimp, is as follows:

1. I claim the within-described arrangement of the belts M and N , so as to turn the several bobbins G^4 and H^4 , or their equivalents, by pulleys carried on the shaft B , from pulleys mounted concentrically within

the mechanism, substantially as and for the purpose herein set forth.

2. I claim the covering-bobbins H^4 , mounted on horizontal axes, the revolving ears H^3 , or their equivalents, and the open-based eyes D^2 , carried on the frame D , all combined and arranged substantially as and for the purposes herein specified.

3. I claim the bevel-gears B^1 C^1 D^1 , the revolving frame D , and guides D^2 , the twisting-spindles G , and covering-devices H^4 , in combination with the concentric shaft B , revolving in the direction opposite to the revolutions of the frame D , and arranged to impart opposite motions to the twisting and covering-mechanism, all substantially as and for the purposes herein set forth.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

Witnesses:

W. H. PALMER, JR.

O. C. LIVINGS,

W. C. DEY.