

W. V. LOWE.
WOVEN PILE FABRIC.
APPLICATION FILED OCT. 30, 1909.

995,693.

Patented June 20, 1911.

3 SHEETS—SHEET 1.

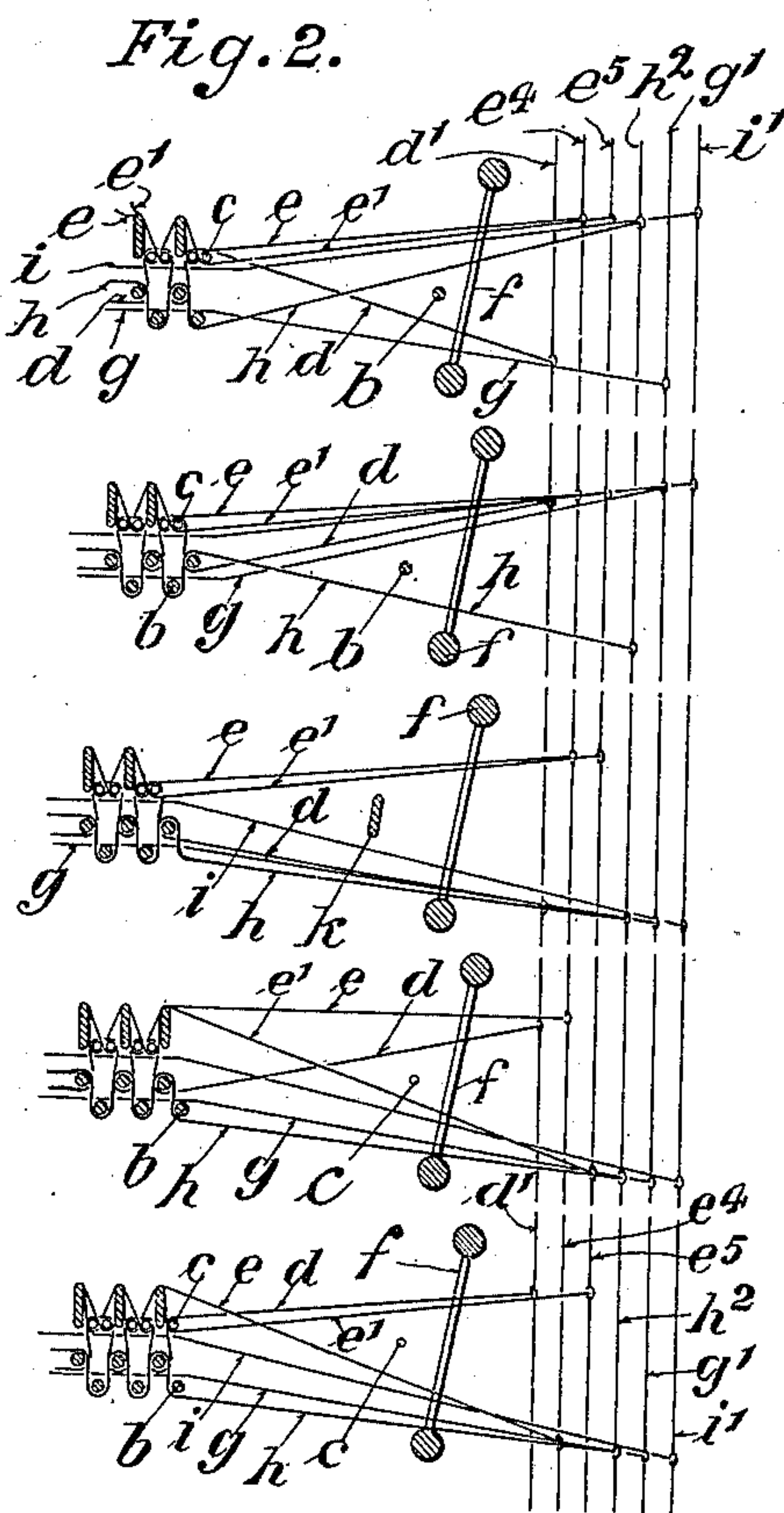
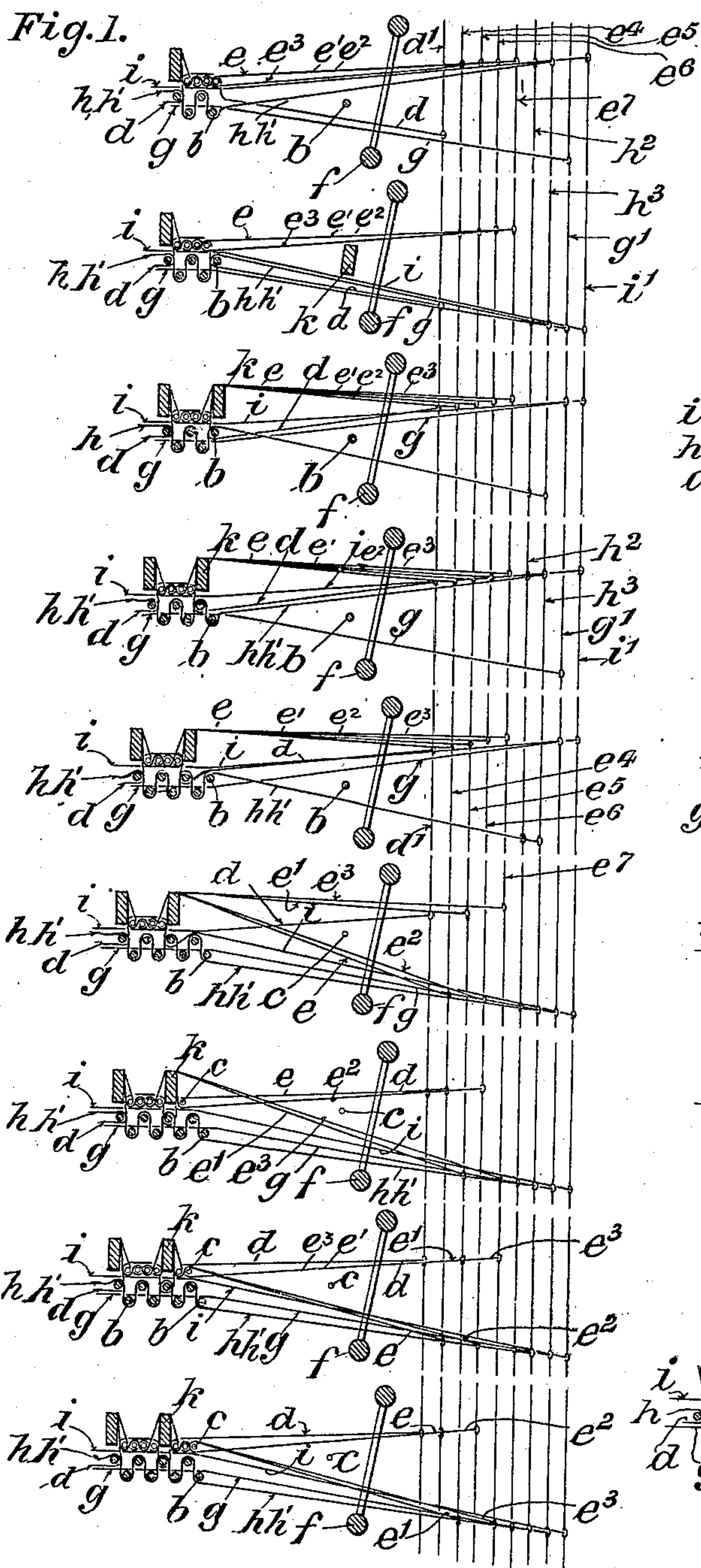
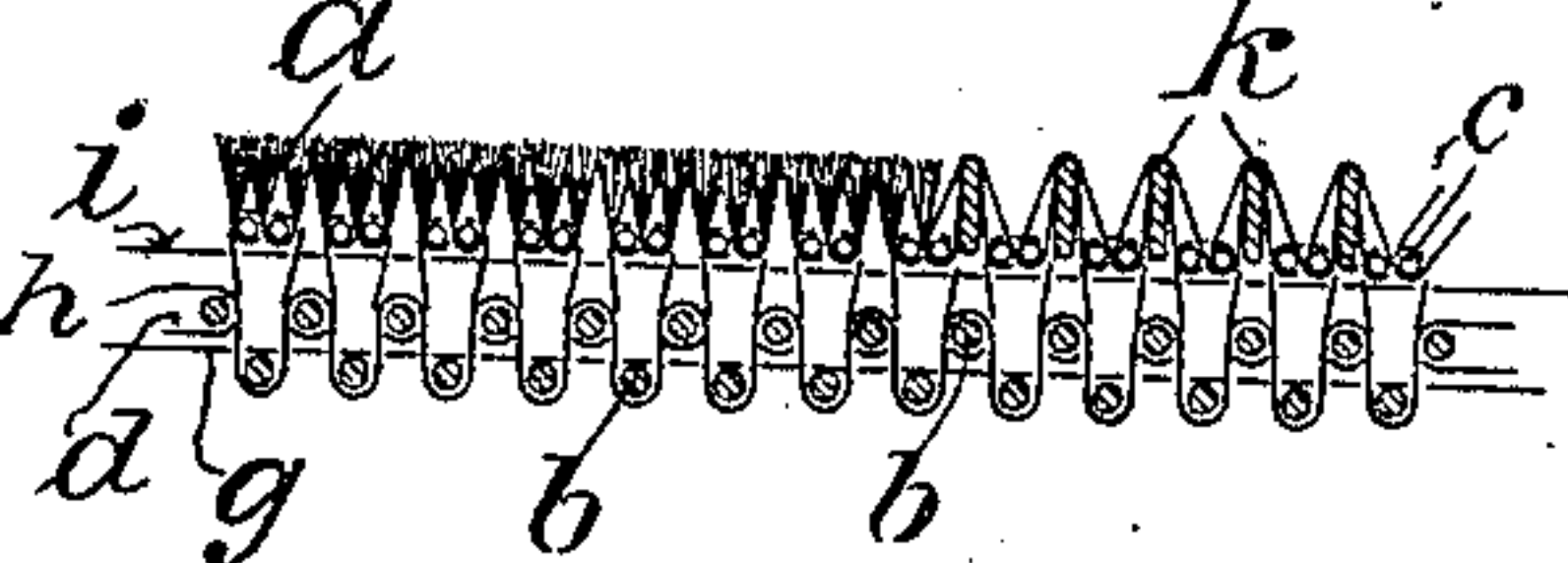


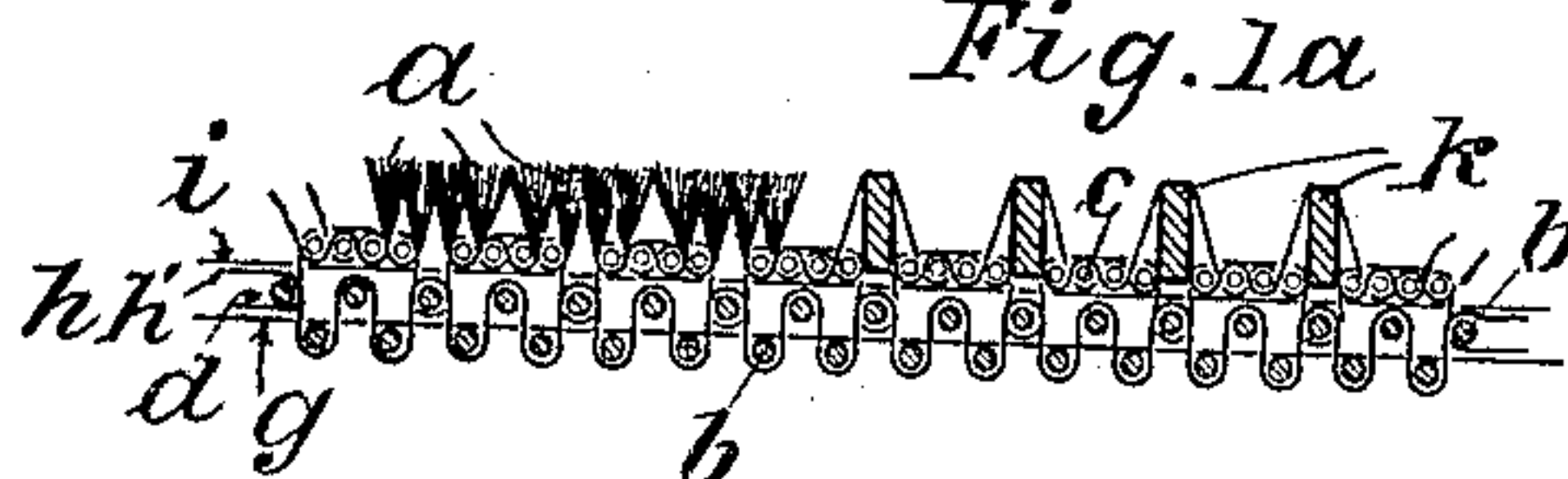
Fig. 2a



Witnesses

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3 SHEETS—SHEET 2.

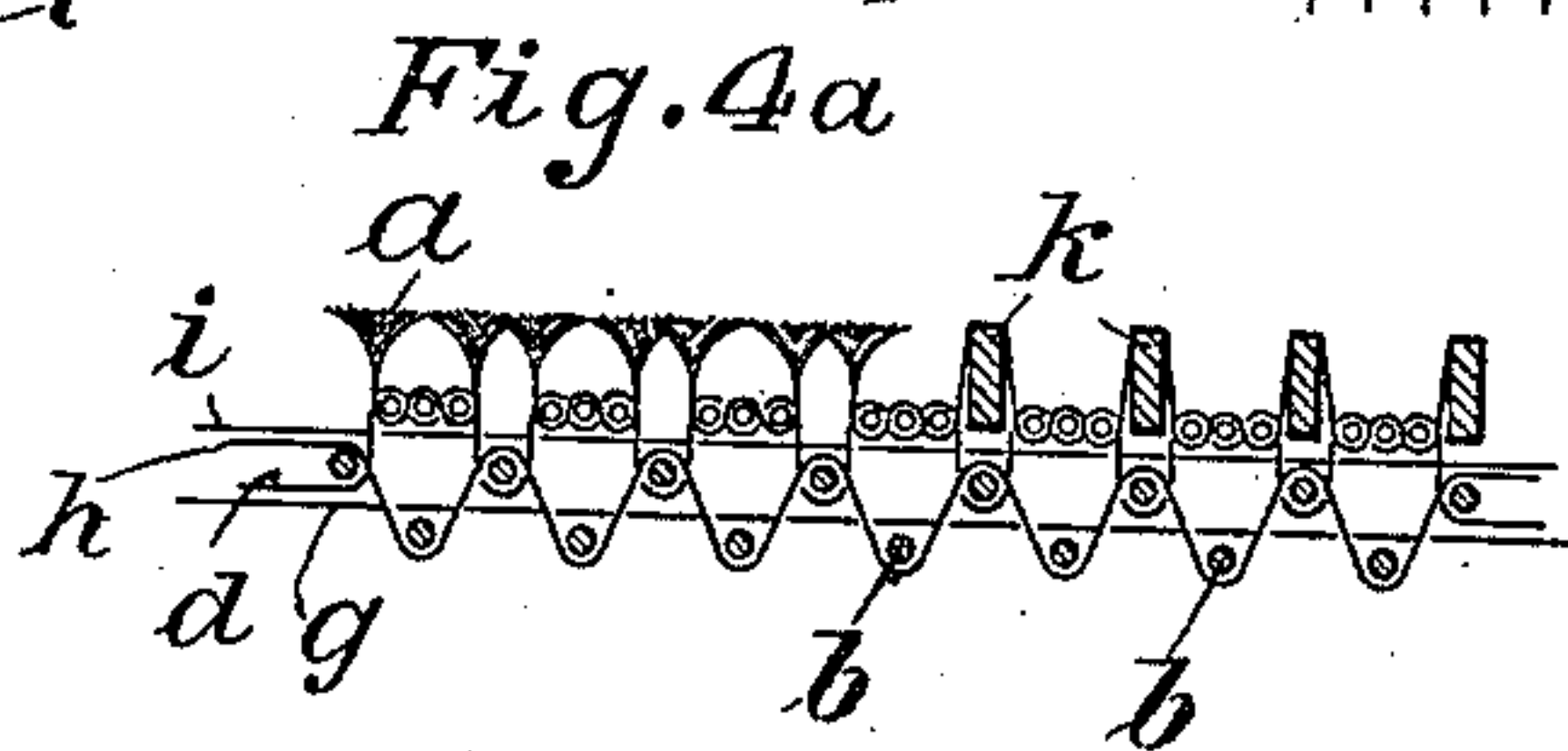
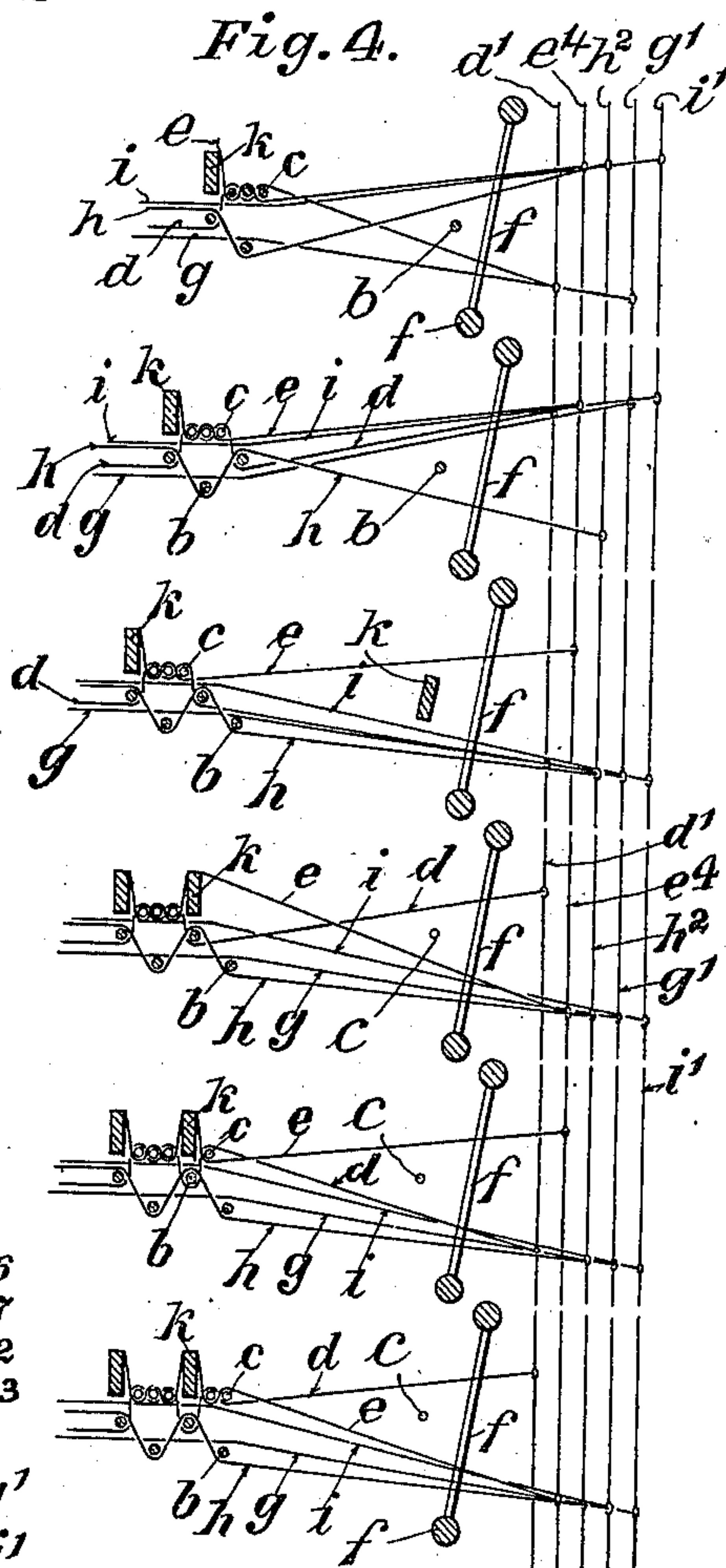


Fig. 3a.

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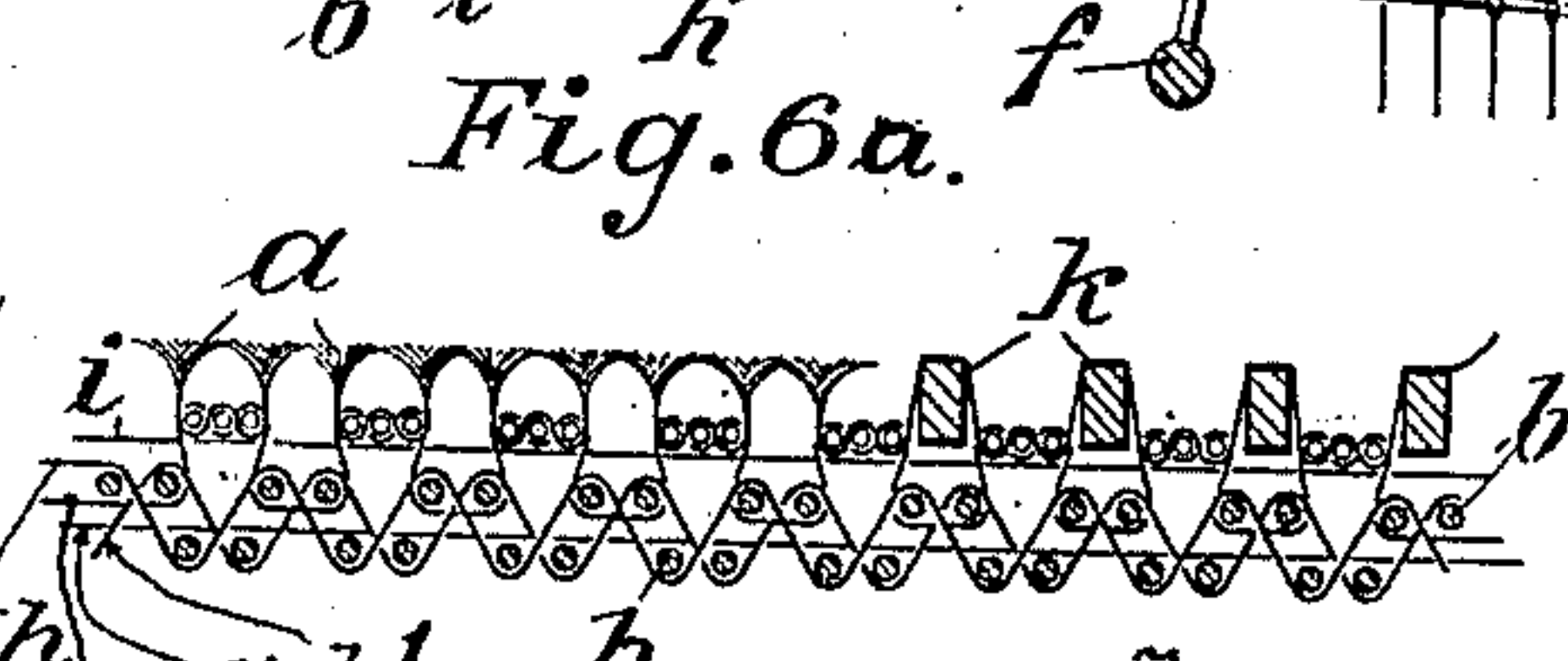
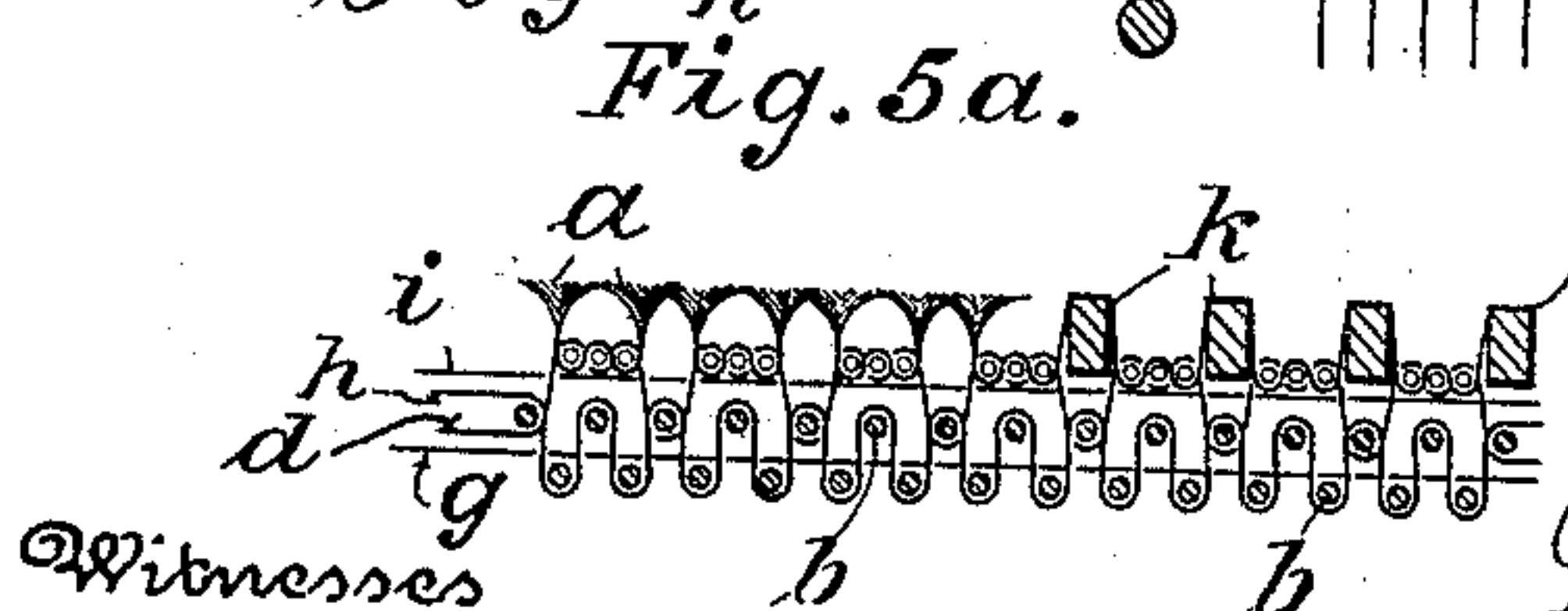
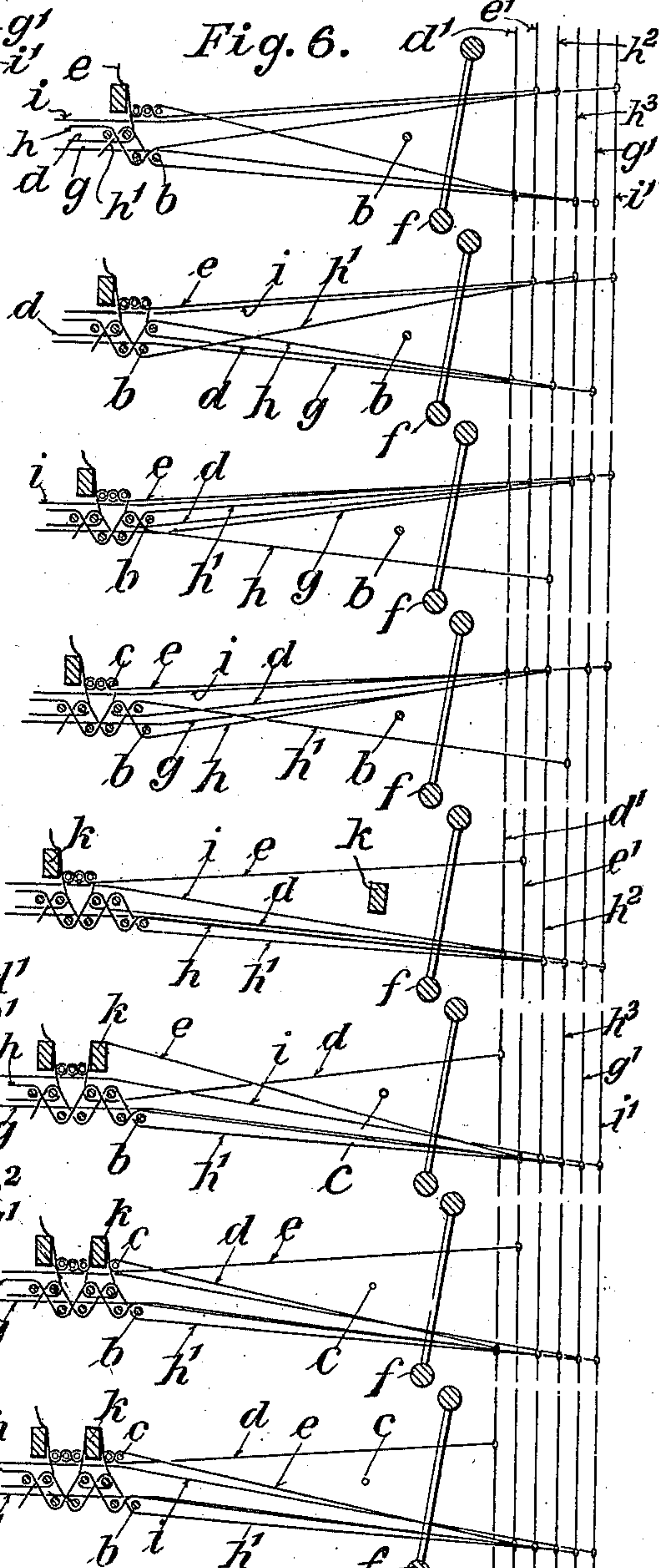
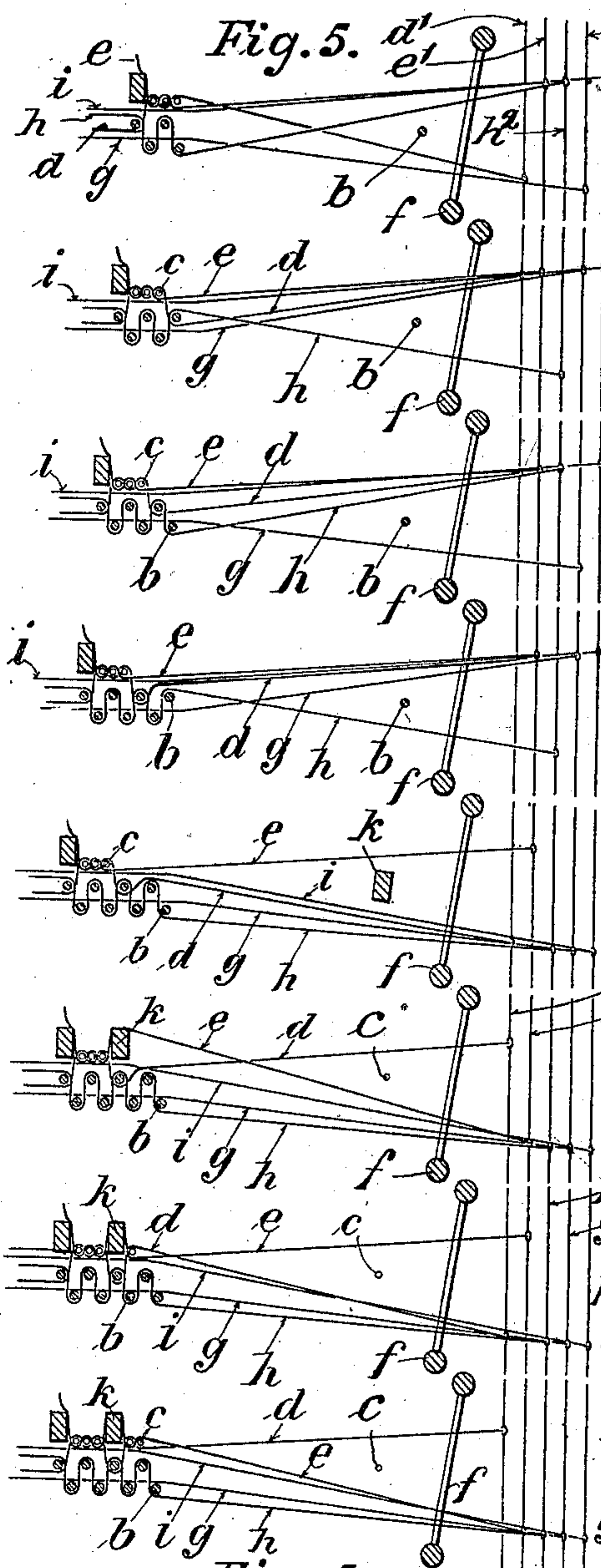
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

WALTER V. LOWE, OF DIGGLE, ENGLAND.

WOVEN PILE FABRIC.

995,693.

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Application filed October 30, 1909. Serial No. 525,513.

To all whom it may concern:

Be it known that I, WALTER VINCENT LOWE, a subject of King Edward VII of Great Britain, and resident of Diggle, in the county of York, England, have invented certain new and useful Improvements in Woven Pile Fabrics, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to woven pile fabrics and more especially to a new or improved weave for pile or carpet fabrics of the Axminster chenille type, the object of my improvements being to produce a fabric of the Axminster chenille type at one operation in a single loom and thus dispense with the weaving in one loom of the fabric from which the chenille or fur weft is obtained and the cutting machine for cutting the said fabric into strips or sections giving the fur weft from which the Axminster or chenille fabric is finally produced in a separate loom.

Under the present ordinary system of weaving Axminster chenille carpets or like pile fabrics, the weft or fur is woven, in the form of a fabric, with a series of shuttles containing different colored wefts according to the design to be produced, these shuttles being changed as required by hand. The fabric is subsequently cut up into longitudinal strips in a cutting machine to form the pile, such longitudinal strips being used as weft in a separate loom, and bound at intervals to a backing, to form the fur or pile surface, the loom having to be stopped at each insertion of the fur to admit of the weaver adjusting it to coincide with the pattern or design being woven, and to comb up the fur to bring it properly on to the surface of the fabric. Usually one strip of fur or chenille will be used to form a single tuft or pick in a given number of rugs.

According to my improved weave, I produce an Axminster chenille type of carpet or like pile fabric in one loom, without previous weaving of the chenille or fur, and at one operation, by the adoption of a suitable tapestry printed, or plain colored warp, which ever is desired, to form the pile.

In the construction of the fabric I use either one or two shuttles, preferably two, one containing weft for binding the base or foundation of the fabric, and the other for binding the pile which is formed by pile wires of any desired height, the use of the

printed or colored warp to produce a pile of plain color, or giving a design and the novel method of binding same, producing a more level surface on the face of the fabric, binding the pile more perfectly and firmly in the fabric, and dispensing with the separate operations of weaving the fur weft, passing same through a cutting machine to cut the strips of fur, and adjusting and combing the fur in setting same in a separate loom, all of which processes necessitate continual stoppages and cause considerable loss of time, the chenille carpet or like pile fabric being woven in a continuously running harness loom, and therefore considerably increasing the production of such fabrics.

The warp may be printed on the drum, or horizontal printing process frame, by the setting of the design on the usual setting frame, this being ordinary and forming in itself no part of the invention.

In order that the nature of my invention may be fully understood I shall in describing same, make reference to the accompanying drawings, in which:—

Figures 1, 2, 3, 4, 5 and 6 each show a series of sectional elevations taken transversely of the loom, and of the weft, illustrating the several steps in a complete cycle of operations in the weaving of a row of tufts of pile to form a fabric of the Axminster chenille type, according to my invention and Figs. 1^a, 2^a, 3^a, 4^a, 5^a and 6^a are sections, corresponding to Figs. 1 to 6, but showing a length of fabric of each respective weave, with some of the loops of pile warp cut and some uncut and with the pile wires therein.

Referring to the drawings and firstly to Figs. 1 and 1^a showing one embodiment of my improved weave, for one tuft or row of pile *a*, there are four shots of thick weft *b* for the plain backing and four shots of thin weft *c*, either wet or dry as desired, for binding the pile, these four shots of thin weft being held securely down by the catcher warp *d*. Fig. 1 shows the pile warp *e*, *e'*, *e''* and *e'''* drawn through four respective harnesses *e*⁴, *e*⁵, *e*⁶ and *e*⁷ so that twisting of the yarn threads together if passed between the same dents of the reed *f* will be prevented and a closer beat up allowed. The pile warp could be distributed over two harnesses instead of four if desired with equal results. Between each dent of the reed

are drawn a two or three-fold jute stuffer warp thread g , drawn through the respective harness g' , binder or ground warp threads h, h' , drawn through the respective harnesses h^2, h^3 , a catcher warp thread d , drawn through the respective harness d' , one thread if desired of the float warp i drawn through the harness i' and one, two, or four strands of pile warp yarn, or one strand of pile warp yarn from alternate harness frames, or some of the said threads may be passed otherwise through the dents of the reed.

In drawing the pile warp yarn through four harnesses, and the binder warp through two harnesses, the change over from the weave of a plain back to the weaving of a diamond back is simplified.

It will be seen from Fig. 1 that nine revolutions of the crank are required to complete the cycle of operations for each tuft of wire, single shed, but of course the number of revolutions necessary can be modified to suit individual requirements.

According to the weave shown at Figs. 1 and 1^a, on the first beat of the lay, the pile warps e, e', e^2 and e^3 , binder warps h, h' and float warp i are up, and the catcher warp d and stuffer warp g are down, the first pick of thick weft b being inserted in the shed. On the second beat of the lay, the pile warps e, e', e^2 and e^3 are up, and the catcher warp d , binder warps h, h' , stuffer warp g and float warp i are down, the pile wire k being inserted, and the pick omitted. On the third beat of the lay, the catcher warp d , pile warps, e, e', e^2 and e^3 , stuffer warp g and float warp i are up, and the binder warps h, h' are down, and the second pick of thick weft b is inserted. On the fourth beat of lay, the catcher warp d , pile warps e, e', e^2 and e^3 , binder warps h, h' and float warp i are up, and the stuffer warp g down, and the third pick of thick weft b is inserted. On the fifth beat of the lay, the catcher warp d , pile warps e, e', e^2 and e^3 , stuffer warp g and float warp i are up, and the binder warps h, h' are down, and the fourth pick of thick weft b is inserted. This completes the operation of inserting the wire and weaving the backing of the fabric. On the sixth beat of the lay, the catcher warp d and pile warps e' and e^3 are up, and the pile warps e, e^2 , binder warps h, h' , stuffer warp g and float warp i are down, and the first pick of thin weft c is inserted. On the seventh beat of the lay, the catcher warp d and pile warps e and e^2 are up, and the pile warps e', e^3 , binder warps h, h' , stuffer warp g and float warp i are down, and the second pick of thin weft c is inserted. On the eighth beat of the lay, the catcher warp d , pile warp e' and e^3 are up, and the pile warp e and e^2 , binder warp h, h' , stuffer warp g and float warp i are down, and the third pick of thin weft c is inserted. On

the ninth beat of the lay, the catcher warp d and pile warp e and e^2 are up, and the pile warp e' and e^3 binder warp h, h' , stuffer warp g and float warp i are down, and the fourth pick of thin weft c is inserted.

In weaving the fabric with a diamond backing or foundation and with four shots of thick weft b and four shots of thin weft c as in Figs. 1 and 1^a, the cycle of operations for one wire or row of tufts of pile would be substantially as illustrated in Figs. 3 and 3^a.

The float warp i , forming the base for the fur or pile warp to lie upon when bound down by the catcher warp d , could be dispensed with if desired.

It will be seen from the foregoing description that there are four picks of thin weft to bind the pile. Owing to the alternate rising and falling of the pile harness frames three picks accomplish the binding process, making a perfect W weave, and the splitting up of the pile threads through the different and alternate rising and falling harness frames gives a very full surface to the fabric.

I show at Figs. 2 and 2^a the full operation for making one row of tufts, or row of pile, with six harnesses, giving a plain back or foundation, with two shots of thick weft b for the backing, and two or more shots of thin weft c for binding the pile, the pile warp operating either with two threads between each dent, or between alternate dents of the reed, and being secured to the backing by the catcher warp d , as will be understood from the description given with reference to Figs. 1 and 1^a, which will also enable the remaining figures on the drawings to be understood.

Figs. 3 and 3^a show a modification of the weave shown at Figs. 1 and 1^a, the same number of shots of thick weft b for the backing, and the same number of shots of thin weft for the binding of the pile being employed. In this case there are seven harnesses, and the four shots of thin weft are held securely down by the catcher warp d which passes under two picks of thick weft. The binder warps h and h' are in alternate dents of the reed, and by the rise and fall of said binder warps a diamond backing is produced, as distinguished from the plain backing produced by the weave shown at Figs. 1 and 1^a. I show at Figs. 4 to 6 an alternative weave to those already described with reference to Figs. 1, 2 and 3.

Figs. 4 and 4^a show the full operation of making one row of tufts, with five harnesses, one each for the pile, stuffer, binder, catcher, and float warps, with two shots of thick weft b for the backing, which is woven plain, and three shots of thin weft c , for the binding of the pile. These three shots of thin weft are held securely by the catcher warp d , which is worked in a different manner from

that shown in Figs. 1, 2 and 3, as will be seen by reference to Figs. 4 and 4^a.

5 Figs. 5 and 5^a show the method of making one row of pile, with the same number of harnesses as in the last example, with four shots of thick weft *b*, and three shots of thin weft *c* for binding the pile, the said thin shots of weft being held down in the same manner as described with reference to Figs. 10 4 and 4^a.

15 Figs. 6 and 6^a show the operation of making one row of pile, with six harnesses, the tuft or pile warp being held down by the passage of the catcher warp under two picks of thick weft. The binder warp is distributed over two harnesses and passes between alternate dents of the reed, and a diamond back instead of a plain back is produced by the weave.

20 In each case in which there are three or more picks inserted, a perfect W bind is given to the pile warp, and a distinct row of tufts to the surface of the fabric.

25 During the operation of weaving, the pile warp is suspended above the backing shed during the weaving of the backing, and the binder, stuffer, and float warps rest on the lay when binding the pile warp.

30 In securing the pile warp to a plain or diamond woven backing as above described, a fabric of the type of an Axminster chenille carpet is produced at one operation and

without stoppage of the loom, changing of shuttle, or adjustment of the fur to suit the pattern or design, such pattern or design being produced by the printed pile warp. 35

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

1. A pile or tufted fabric having three 40 planes of weft, and comprising pile warps, two or more wefts for each tuft, binder warps interwoven with said wefts, a second set of wefts, a third set of wefts, a float warp between the first and second sets of 45 wefts, a stuffer warp between the second and third set of wefts, a catcher warp to bind the sets of wefts.

2. A pile or tufted fabric having tufts on the surface of the fabric, and three planes of 50 weft, two or more wefts on the upper plane for each tuft, binder warps interwoven with the wefts in the upper plane, and with the wefts in the middle plane, a stuffer warp between the second set of wefts, and the third 55 set of wefts in the lower plane of the fabric, a catcher warp interwoven with the second and third planes of wefts.

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

WALTER V. LOWE.

Witnesses:

THOMAS H. BARRON,
ELSIE M. GLEDHILL.