

No. 621,720.

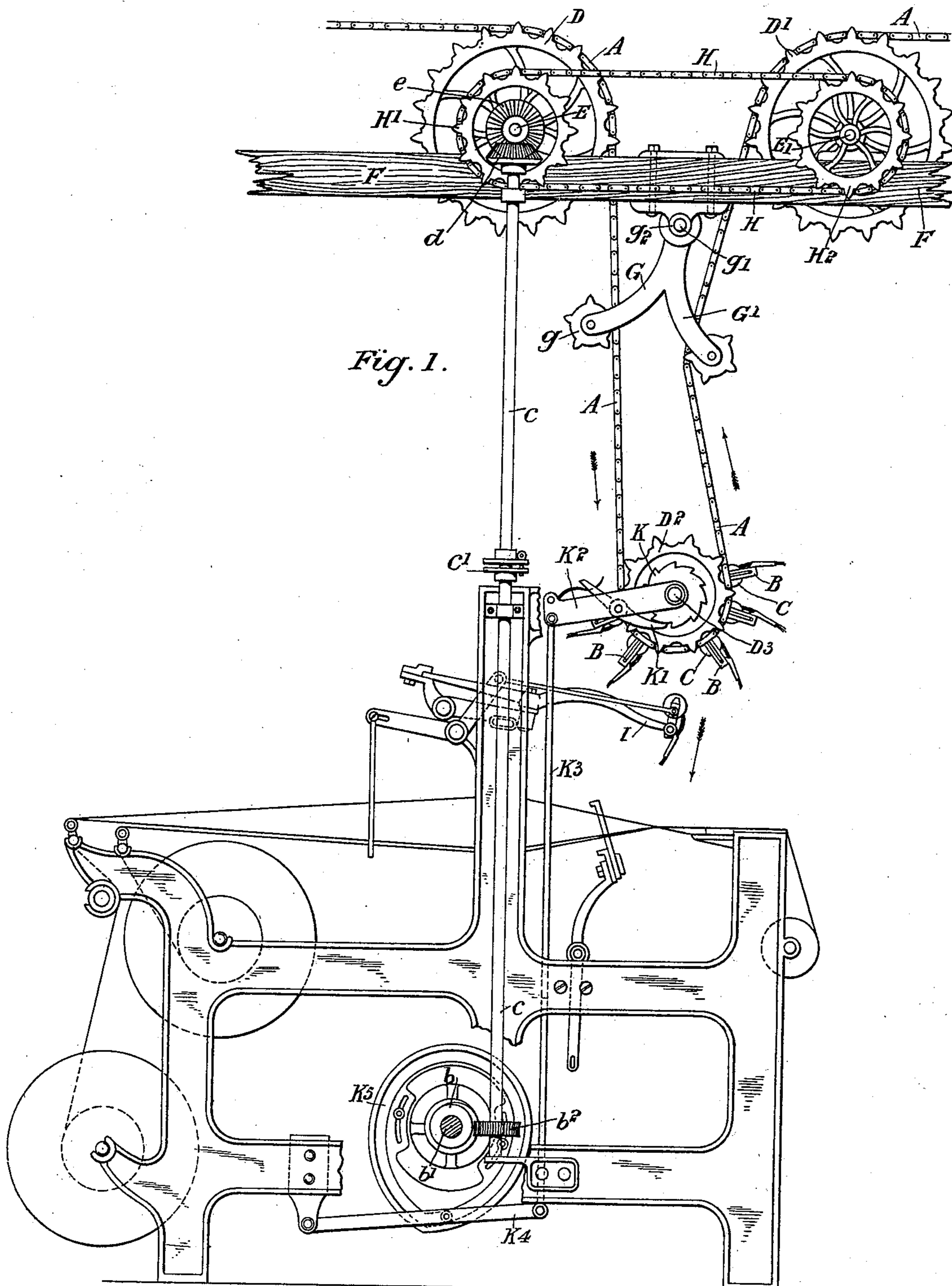
Patented Mar. 21, 1899.

T. M. SOUTHWELL & T. W. HEAD.  
LOOM FOR WEAVING MOQUETTE CARPETS.

(No Model.)

(Application filed May 27, 1898.)

4 Sheets—Sheet 1.



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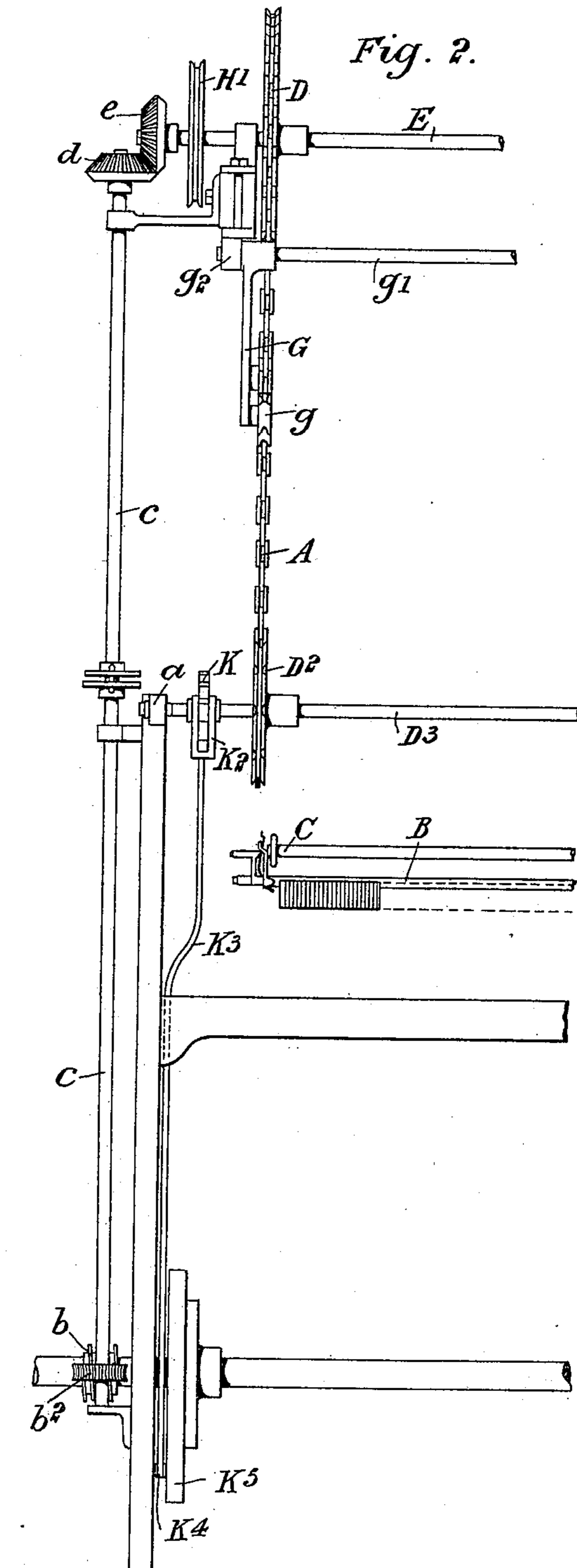
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4 Sheets—Sheet 2.



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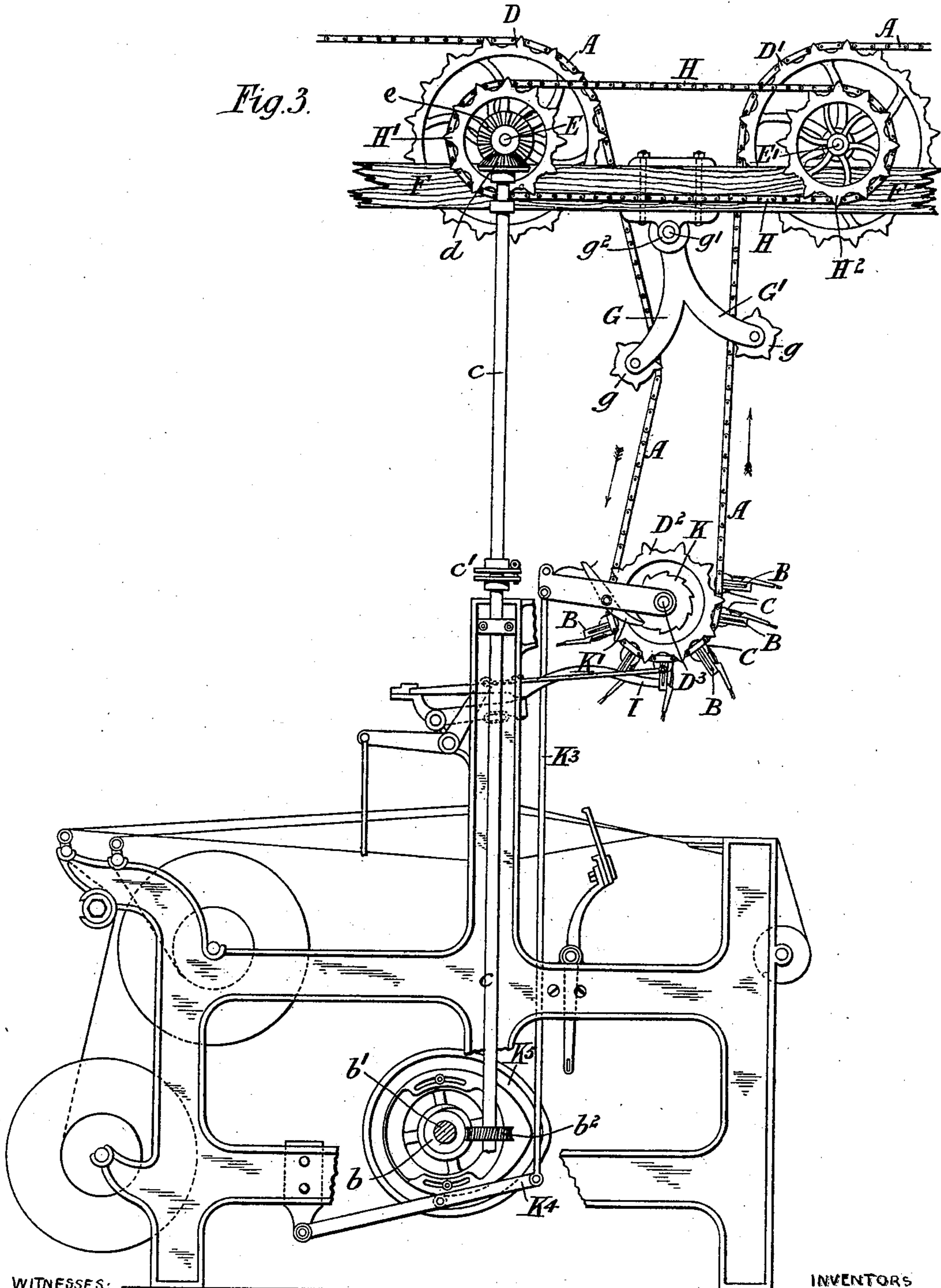
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4 Sheets—Sheet 3.



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No. 621,720.

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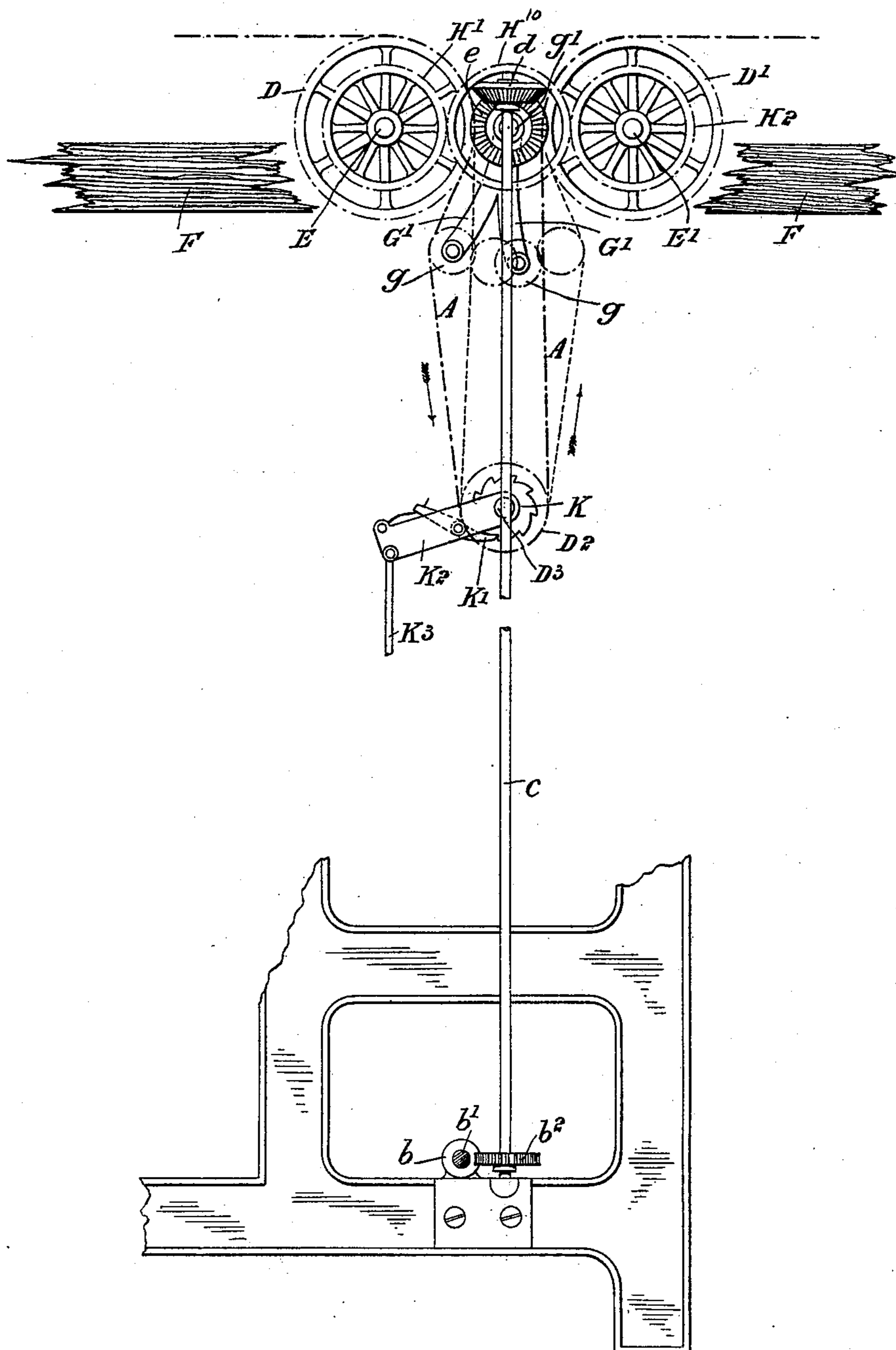
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Fig. 4.



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# UNITED STATES PATENT OFFICE.

THOMAS MARTIN SOUTHWELL AND THOMAS W. HEAD, OF BRIDGENORTH,  
ENGLAND.

## LOOM FOR WEAVING MOQUETTE CARPETS.

SPECIFICATION forming part of Letters Patent No. 621,720, dated March 21, 1899.

Application filed May 27, 1898. Serial No. 681,935. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS MARTIN SOUTHWELL, manufacturer, and THOMAS WILLIAM HEAD, loom-turner, subjects of the Queen of Great Britain and Ireland, and residents of Bridgenorth, in the county of Salop, England, have invented certain new and useful Improvements in Looms for Weaving Moquette Carpets or other Tufted Fabrics, (for which we have applied for a patent in Great Britain, No. 25,728, dated November 5, 1897,) which improvements are fully set forth in the following specification.

This invention relates to looms for weaving moquette carpets or other tufted fabrics, more particularly to such looms wherein the tuft-spools are carried in endless chains or similar spool-carriers and the tuft-spools are removed in succession from the said carriers and replaced after inserting the tufts by what are known as "transferring-arms." It is important in looms of this kind that the spool-carriers should be moved very steadily. Otherwise the tuft-yarns projecting from the spool-frames on the carriers are liable to be disarranged and cause waste of the tuft-yarn. At the same time it is desirable that the spools be moved quickly into position to be engaged by the transferring-arms, so as to prevent loss of time, which occurs in ordinary tuft-looms of this kind by keeping the transferring-arms waiting long after inserting a spool in the carriers and while the next spool is being brought into position to be engaged by the said transferring-arms. It has been found in practice with looms of this kind hitherto in use that owing to the great weight of the carriers on account of the number of spools required to be carried thereby to form a pattern the said carriers cannot be moved so quickly as is desirable without at the same time being unsteady in their movements.

The object of this invention is to provide means whereby rapid and steady intermittent movements can be given to a portion of the spool-carriers at the part where the spool is to be removed from and returned to the carriers, while a continuous, slow, and steady movement is given to the main portion of the said carriers.

We will describe our invention with ref-

erence to the accompanying drawings, of which—

Figures 1 and 2 are elevations at right angles to each other of so much of a tuft-loom as is necessary to illustrate our present invention, Fig. 1 showing the spool-carrier in the position it assumes while a spool is being removed from the said carrier to insert a row of tufts in the fabric and the previously-removed spool having been reinserted in the carrier by the transferring-arms. Fig. 3 is a view similar to Fig. 1, showing the removed spool as having been just reinserted in the carrier and the next spool in the carrier about to be brought into position to be engaged and removed from the carrier by the transferring-arms. Fig. 4 shows, partly diagrammatically, a slight modification in the arrangement of the parts shown in Figs. 1, 2, and 3.

In the drawings we have shown only one side of the loom—namely, the side at which the driving mechanism for operating the spool-carriers is arranged—it being understood that a similar arrangement is provided at the opposite side of the loom except the mechanism for driving the spool-carriers, which driving mechanism is only required on one side of the loom, although this driving mechanism may, however, be duplicated, if desired. The spool-carrier consists of endless chains A, with the links of which chains frames B, in which the tuft-spools C are mounted, are caused to engage, as is well understood, the said frames B being constructed in the ordinary manner. Each spool-carrier chain A is carried on and conducted around sprocket-wheels  $D D' D^2$ , as usual; but instead of, as heretofore in looms of this kind, imparting to the whole of the spool-carriers intermittent traveling movements to bring the spools successively into position to be removed by the transferring-arms only a small portion of the spool-carriers has intermittent movement given to it, while the main portion of the said carriers receive a continuous slow movement. The lower sprocket-wheels  $D^2$ , around which the chain spool-carriers pass, are fast on a shaft or spindle  $D^3$ , extending across the loom and mounted in suitable bearings in the loom-frame or on centers, as shown at *a*, Fig. 2, the two upper sprocket-wheels  $D D'$  being fast on shafts

E E', mounted in bearings on a beam F or other suitable support situated above the loom, as shown. The other portion of the endless chains A beyond the sprocket-wheels D D' may be supported on any desired number of guide-wheels, which are not shown in the drawings, the said chains, with the spools carried thereby, being of great weight. The length of the chain A between the lower sprocket-wheel D<sup>2</sup> and the upper sprocket-wheels D D' is longer than is sufficient to reach in straight lines from the said wheels D D' to the wheel D<sup>2</sup>, and consequently, except for the arrangement according to this invention, as shown in the drawings, the chain would hang as a loose loop between the said wheels D D' and the wheel D<sup>2</sup>. To maintain this portion of the chain between the wheels D D' and the wheel D<sup>2</sup> taut, the two sides of the loop are engaged by arms G G', preferably provided with rollers or sprocket-wheels, as at g, to engage the links of the chain, the engaging portions of the said arms being at such a distance apart as to deflect the chain sufficiently to take up the slack and render it taut between the wheels D D' and the wheel D<sup>2</sup>. The arms G G' are carried on a rod or spindle g', to which they may be fixed and the rod or spindle be free to rock or oscillate on the bearings g<sup>2</sup>, or the rod or spindle may be fixed and the arms G G' be mounted loosely on the said rod or spindle, so as to be free to oscillate thereon. A continuous slow motion is given to the main portion of the spool-carrier—that is to say, the whole of the said carrier except that portion which is contained between the points of contact of the oscillating arms G G' and the lower sprocket-wheel D<sup>2</sup>. This slow continuous motion may be obtained by any suitable arrangement of mechanism, a convenient arrangement being shown in the drawings consisting of a worm b on the cam or tappet shaft b' of the loom engaging in a worm-wheel b<sup>2</sup>, keyed on a vertical shaft c, the said shaft having fast thereon a bevel-wheel d, in gear with a corresponding wheel e on the shaft or spindle E of one of the upper sprocket-wheels D D'. The shafts E E' of the said upper sprocket-wheels D D' are geared together by a chain H, passing around and engaging with sprocket-wheels H' H<sup>2</sup> on the said shafts E E', so that on a slow rotary motion being given to the vertical shaft c by the worm b and worm-wheel b<sup>2</sup> such motion is transmitted, through the gearing d and e, to the shaft E and sprocket-wheel D and thence, through the chain H, engaging the wheels H' H<sup>2</sup>, to the sprocket-wheels D', and in this manner a slow continuous traveling motion is given to the portion of the spool-carrier above the points of contact of the said spool-carrier with the deflecting-arms G G' without causing a traveling motion to the portion of the spool-carrier below the said contact-points, which portion remains stationary while the transferring-arms I operate to remove a spool from the spool-carrier, in-

sert a row of tufts in the fabric, and return the removed spool to the spool-carrier. The vertical shaft c is preferably made in two parts connected together by a suitable coupling, such as c', so that the two parts can be readily separated to permit of the looped portion of the carrier being moved in the reverse direction to remedy any defect which may occur in the order of the tuft-spools. During these movements of the transferring-arms I, the slow traveling movement of the main portion of the spool-carrier continuing in the direction of the arrows in Figs. 1 and 3, a portion of the carrier above the contact-point therewith of the arm G' is taken up by the sprocket-wheel D', while a like portion of the said carrier is given off from the sprocket-wheel D, and the spool-carrier by exerting pressure on the arm G' causes the arms G G' to oscillate on their shaft or axis g', thereby straightening the portion of the carrier between the sprocket-wheels D' and D<sup>2</sup> and deflecting the portion of the said carrier between the sprocket-wheels D and D<sup>2</sup> into the position shown in Fig. 3. By the time the spool-carrier has moved into the position shown in Fig. 3 the transferring-arms I will have been raised and reinserted the spool into the space in the spool-carrier from which it had been removed, and while the said transferring-arms are in this raised position a motion of partial rotation is given to the lower sprocket-wheels D<sup>2</sup>, so as to bring the next spool in the carrier into position to be engaged by the transferring-arms I. The partial rotary motions may be imparted to the sprocket-wheels D<sup>2</sup> by any convenient means. For example, as shown in the drawings, on the spindle D<sup>3</sup>, carrying the lower sprocket-wheels D<sup>2</sup>, there is fixed a ratchet-wheel K, with which a spring-pawl K' engages. The said spring-pawl is pivoted to an arm or arms K<sup>2</sup>, loosely mounted on the spindle D<sup>3</sup>, the said arms or arm being connected by a rod K<sup>3</sup> to a lever K<sup>4</sup>, on which a cam K<sup>5</sup> on the tappet-shaft of the loom operates at the required periods to cause the pawl to give the sprocket-wheels D<sup>2</sup> intermittent partial rotation to bring the spools in succession into position to be engaged by the transferring-arms I. As the construction of and means for operating the transferring-arms are as usual and constitute no feature of the present invention, we have not considered it necessary to fully describe the same. It is, however, to be understood that the movements of the said arms and the intermittent movements of the sprocket-wheels D<sup>2</sup> are suitably timed to operate in the order required.

Each partial rotation given to the sprocket-wheels D<sup>2</sup> causes the oscillating arms G G' and the portion of the spool-carrier between the sprocket-wheel D<sup>2</sup> and the wheels D D' to move from the position shown in Fig. 3 into the position shown in Fig. 1. The transferring-arms then operate to carry a spool from the spool-carrier, insert a row of tufts in the fabric, and return the spool to its position in

the carrier, the operation hereinbefore described being then repeated until the desired length of fabric is woven.

Instead of the spool-carrier being deflected inwardly by the arms G G', as shown in Figs. 1 and 3, the said arms may be arranged, as shown diagrammatically in Fig. 4, so as to deflect the said carrier in an outward direction, and instead of driving the sprocket-wheel D' from the sprocket-wheel D by means of an endless chain H, as before described, the shaft or spindle g', which carries the deflecting-arms G G', may be provided with a toothed wheel H<sup>10</sup>, gearing with corresponding wheels H' H<sup>2</sup>, fast on the shafts E E' of the sprocket-wheels D D', the shaft or spindle g' being driven from the shaft b' by bevel-gearing d and e and worm and worm-wheels b b<sup>2</sup> from any suitable part of the loom. The details of construction may be otherwise considerably varied without departing from the nature of this invention.

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

1. In looms for weaving moquette carpets or other tufted fabrics, the combination with endless chains or like tuft-spool carriers and transferring-arms or equivalent means for removing from and inserting the spools in the carriers, of means for imparting intermittent traveling movements to the portion of carriers

from which a spool is to be removed and replaced, and means whereby a continuous slow traveling movement is imparted to the main portion of the carriers substantially as hereinbefore described.

2. In looms for weaving moquette carpets and other tufted fabrics the combination with endless-chain tuft-spool carriers supported on sprocket or chain wheels arranged so as to form slack loops in the carriers at the part where the tuft-spools are removed from and reinserted in the carriers and means for so removing and reinserting the carriers: of suspended arms engaging the sides of the loops in the carriers to deflect the sides of the said loops; means for imparting intermittent traveling movements to the portion of the carriers from which the spools are removed and replaced and means for imparting a continuous slow traveling motion to the main portion of the carriers beyond the point on contact therewith of the loop-deflecting arms substantially as and for the purpose hereinbefore described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

T. MARTIN SOUTHWELL.  
T. W. HEAD.

Witnesses:

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A. G. BARLOW.