

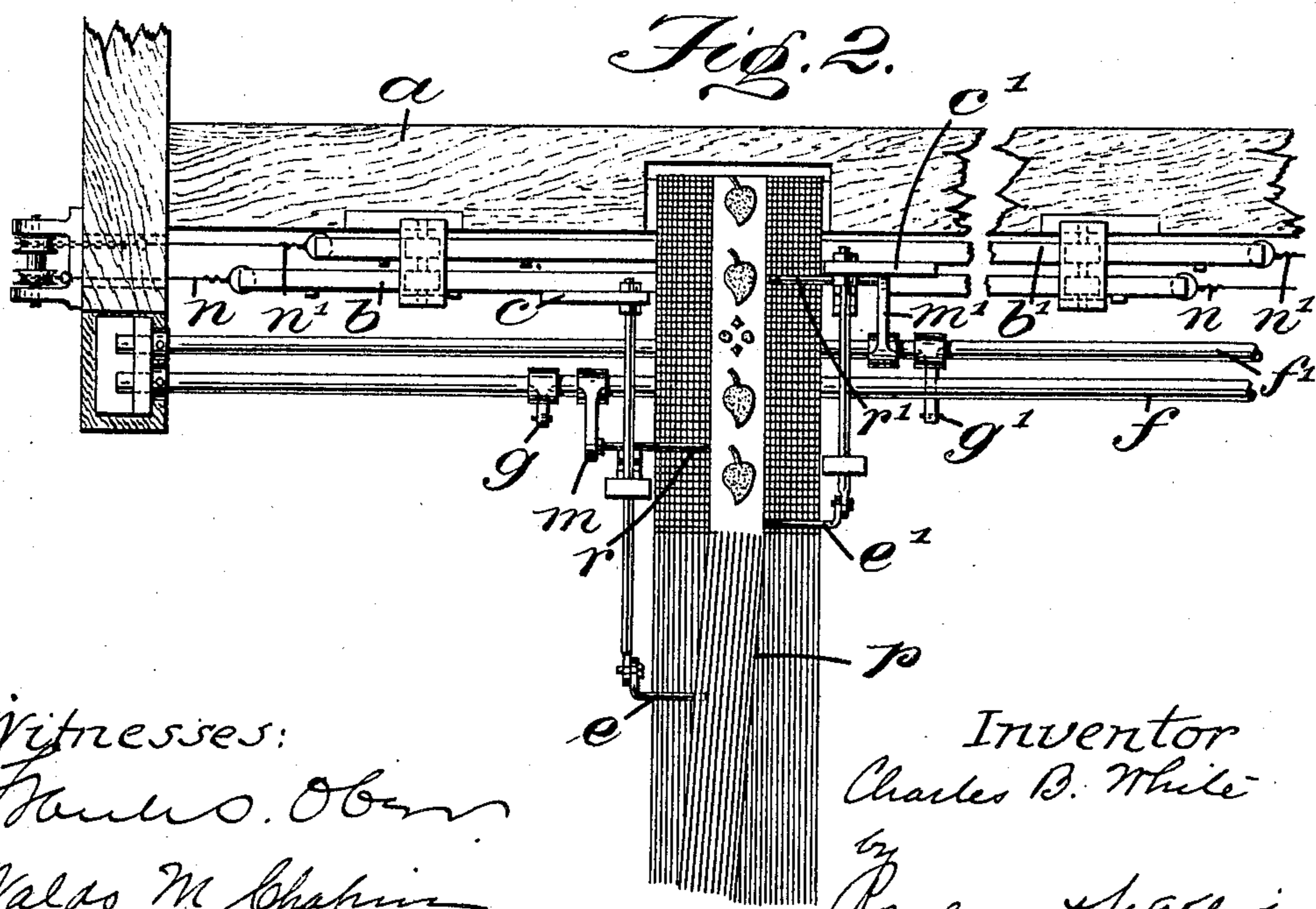
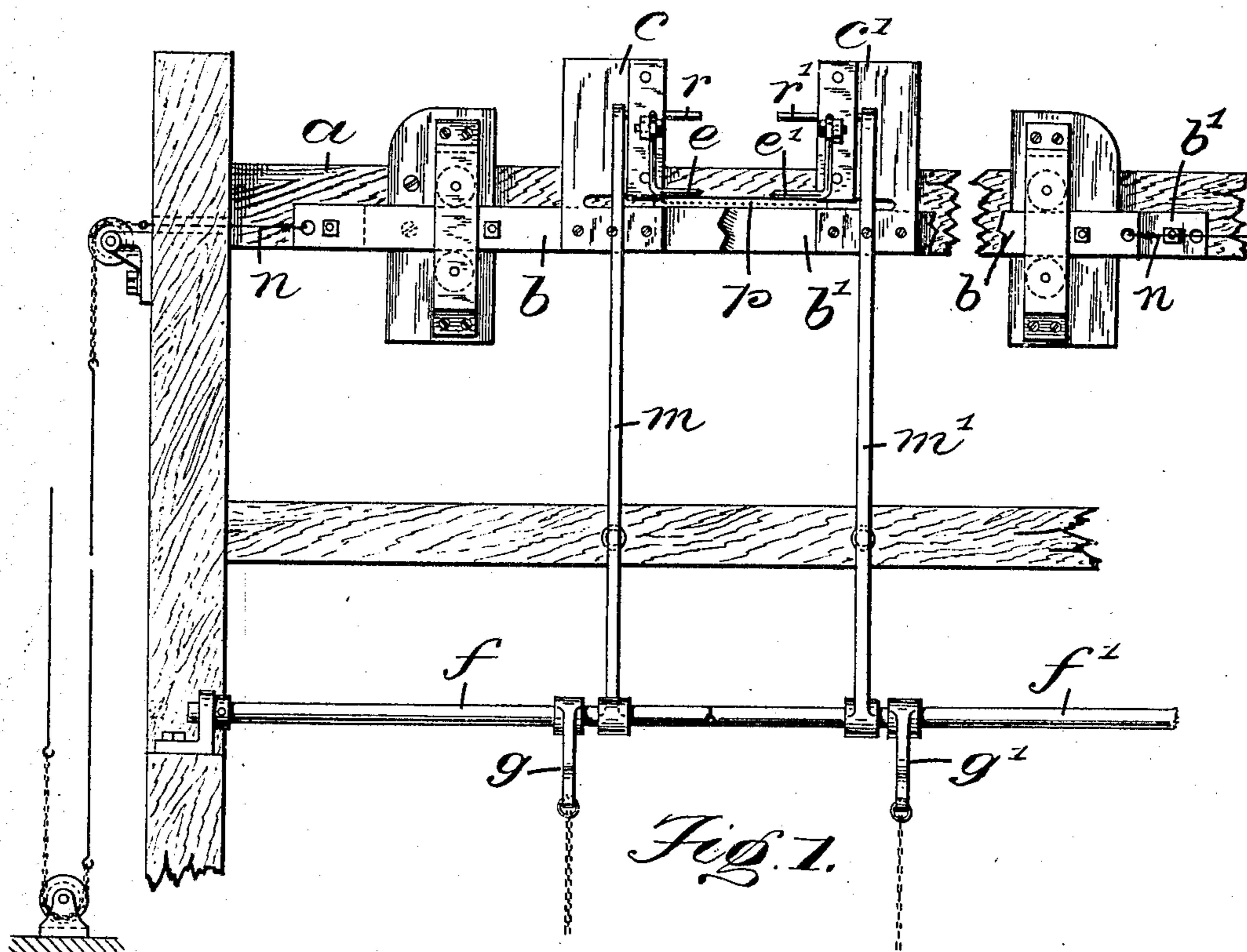
No. 871,382.

PATENTED NOV. 19, 1907.

C. B. WHITE.
LOOM FOR WEAVING PILE FABRICS.

APPLICATION FILED FEB. 4, 1906.

4 SHEETS—SHEET 1.



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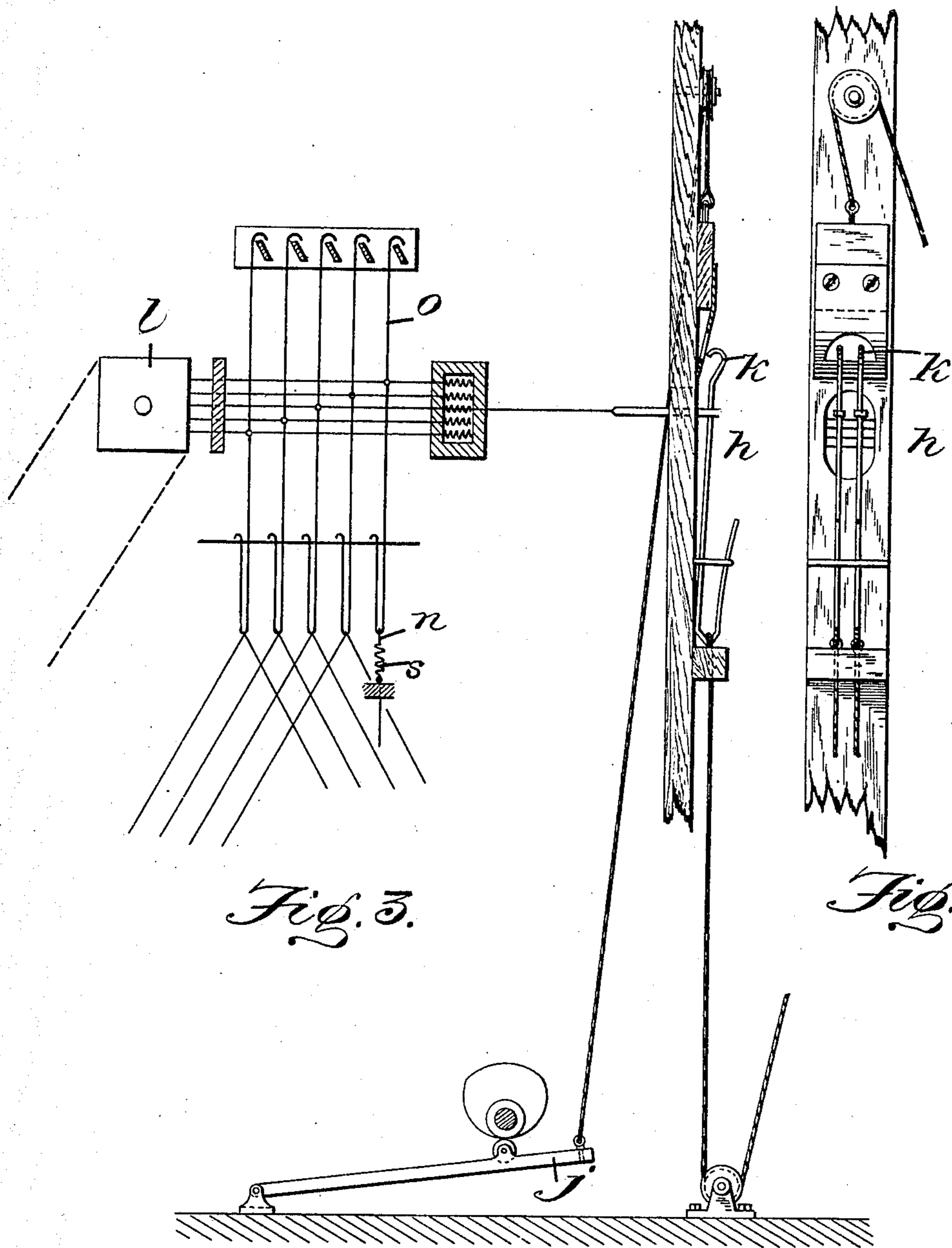


Fig. 3.

Fig. 4.

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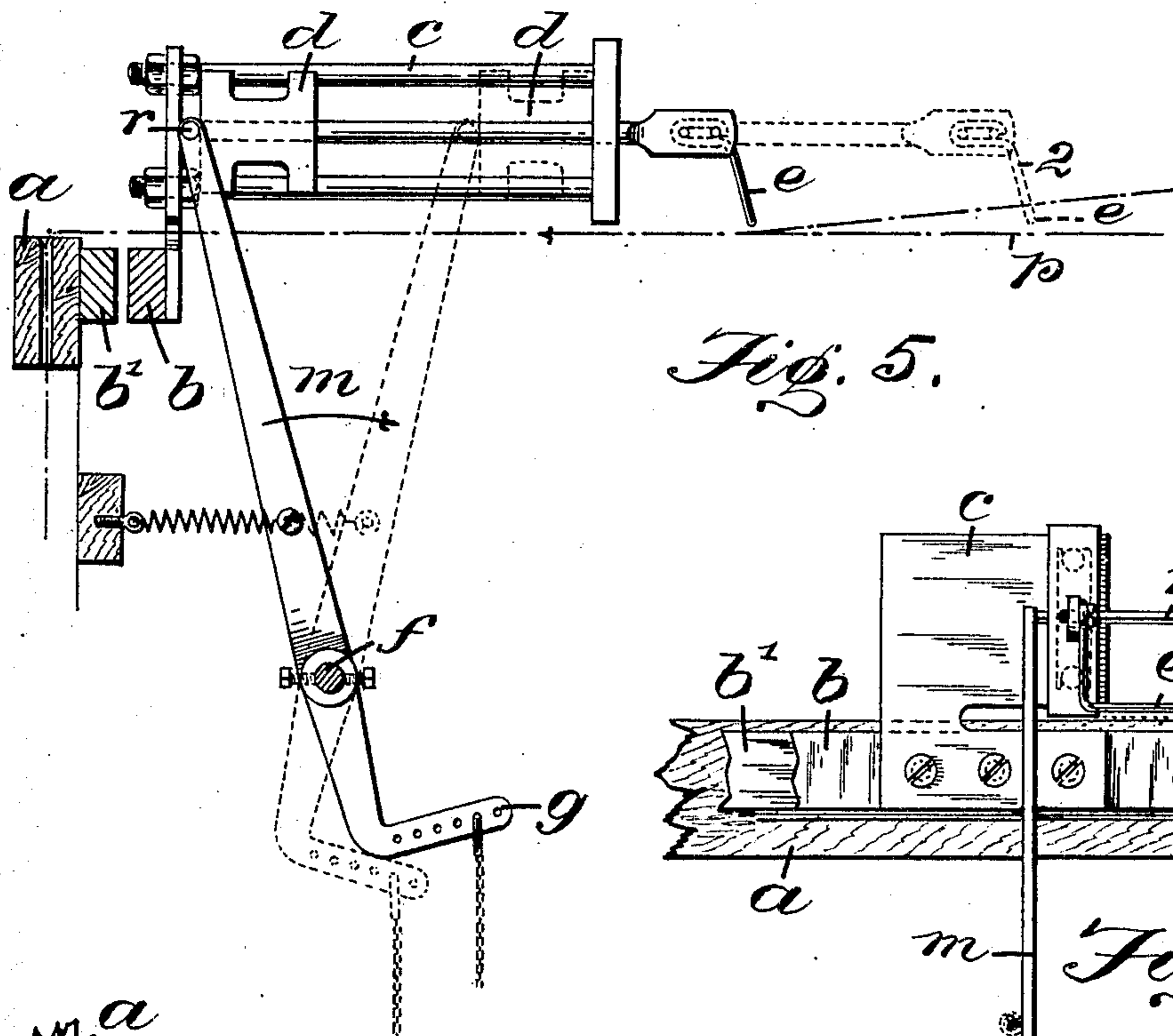


Fig. 5.

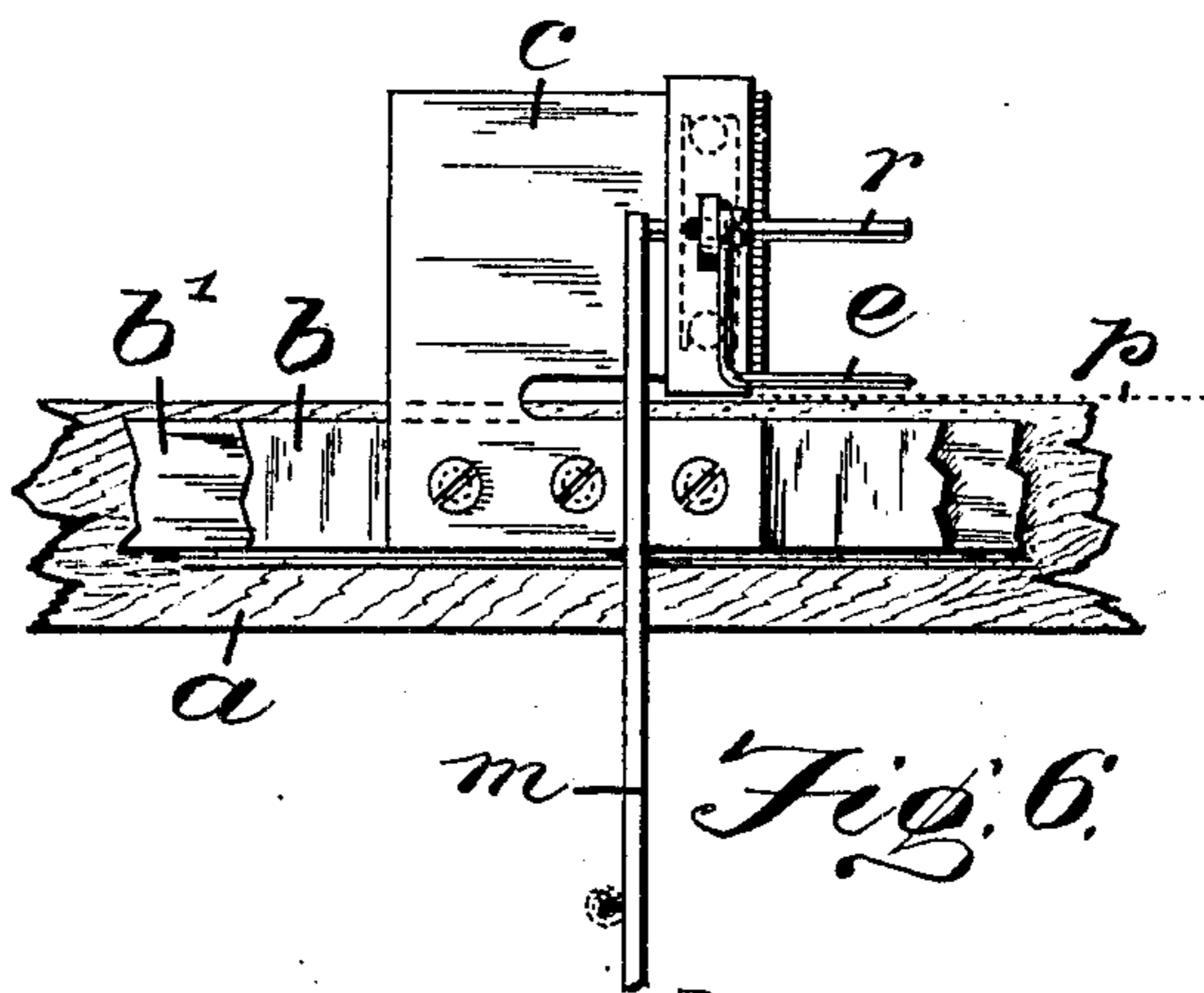


Fig. 6.

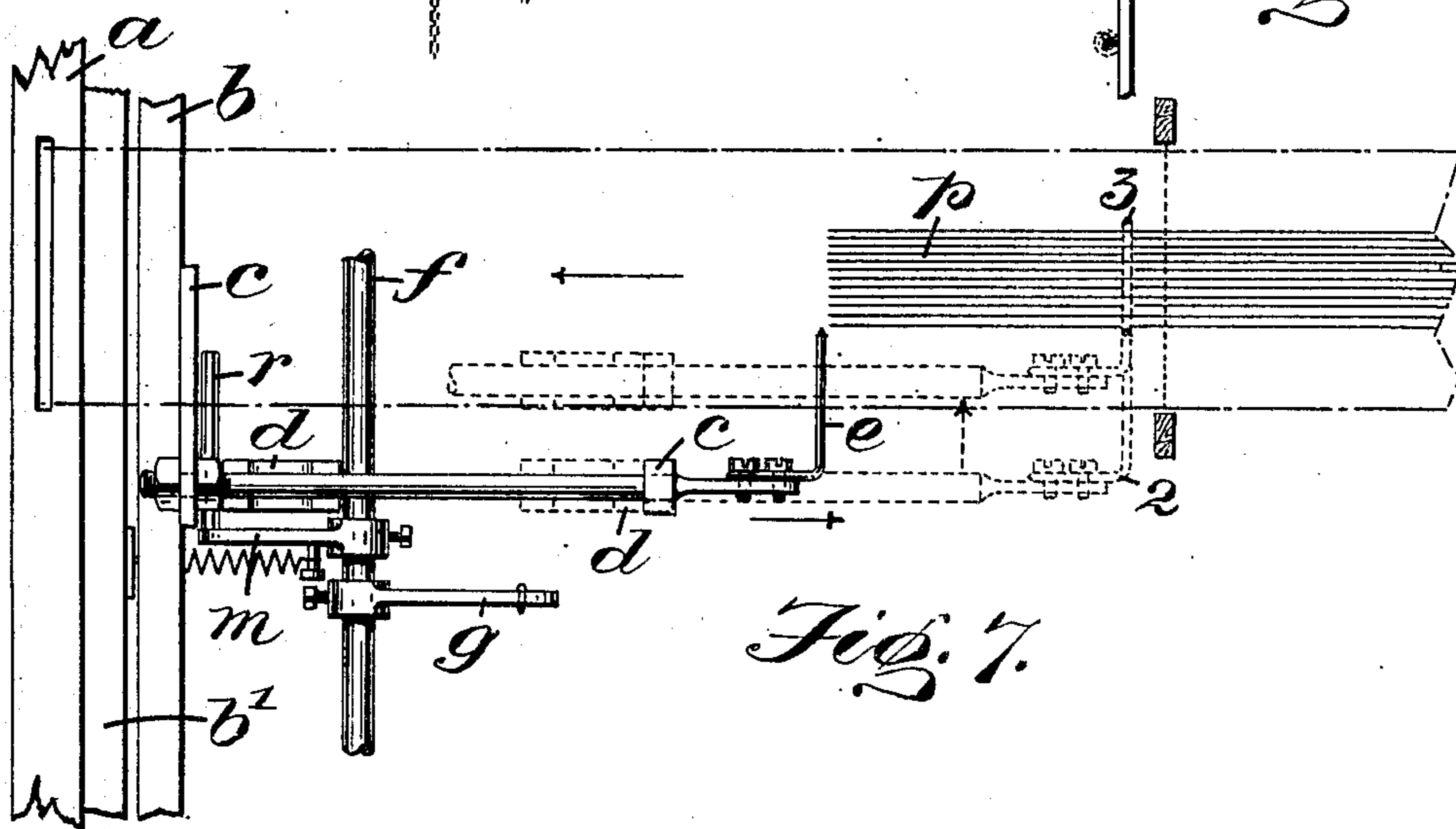


Fig. 7.

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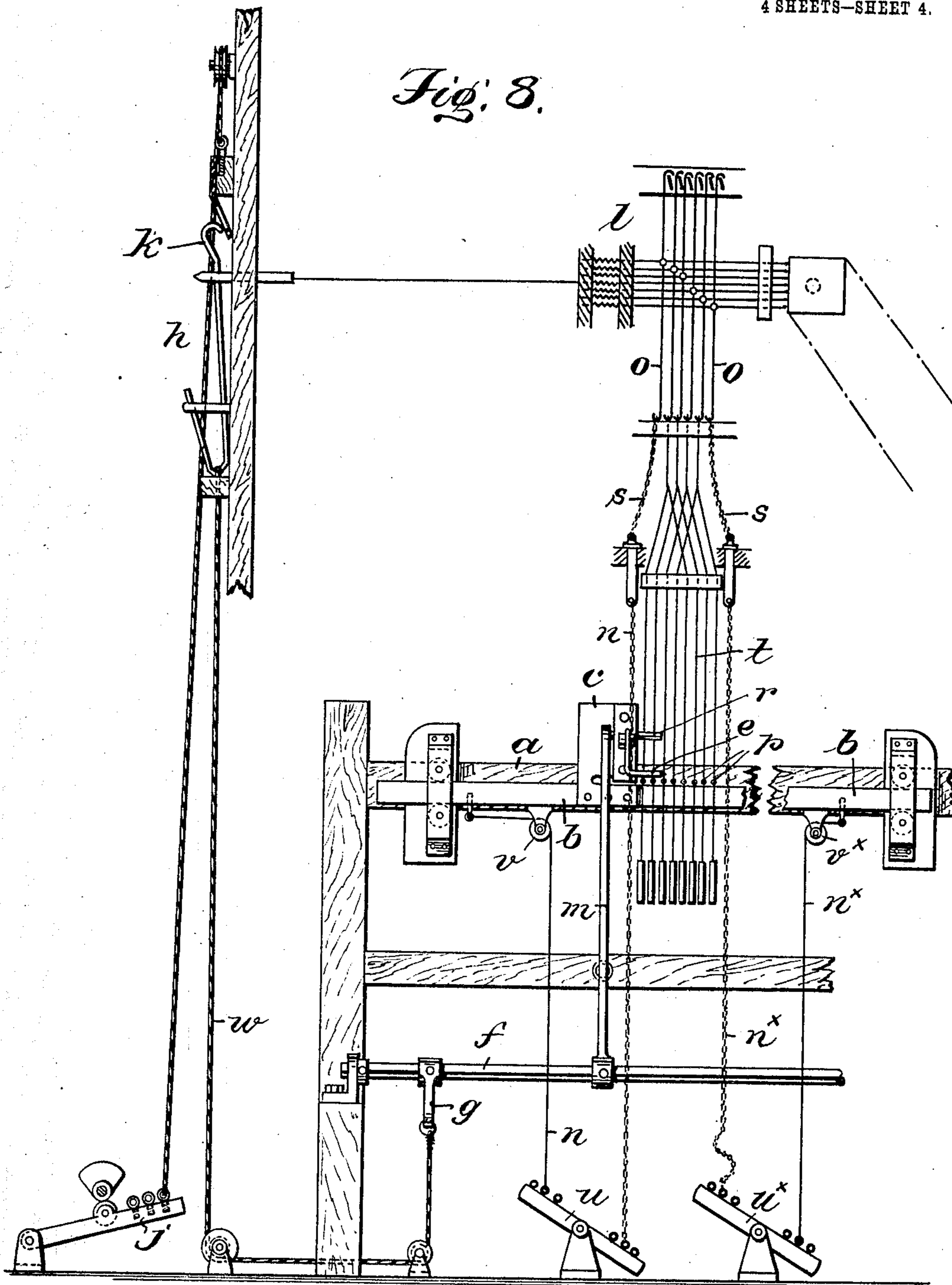
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4 SHEETS—SHEET 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES BERNARD WHITE, OF MANCHESTER, ENGLAND.

LOOM FOR WEAVING PILE FABRICS.

No. 871,382.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed February 4, 1905. Serial No. 244,080.

To all whom it may concern:

Be it known that I, CHARLES BERNARD WHITE, a subject of the King of Great Britain and Ireland, and a resident of Manchester, in the county of Lancaster, England, have invented new and useful Improvements in and Relating to Looms for Weaving Pile Fabrics, of which the following is a specification.

These improvements relate to looms and to appliances employed therein for the production of a warp pile or like pattern in a fabric either alone or in combination with a figured or other pattern. Such appliances may be applied to broader looms for the production of any suitable fabric, but they are particularly applicable to smallware looms and to the manufacture of coach lace, trimmings, edgings, ribbons, or the like narrow fabric, for the production of patterns which, hitherto, it has only been possible to produce by hand.

The warp pile loops are formed by means of a wire or by wires which are so disposed and arranged that they may be moved by the jacquard mechanism as desired and according to the pattern required both in a direction along the warp threads and in a direction about transverse thereto, so that such wire or wires can be inserted into the shed and be withdrawn as required.

It will be preferred to employ two sets of wires and their operating devices, one along each side or edge of the warp threads, but for the present it will be more convenient to describe the construction and operation of one such wire only and its conjoined parts, although in Figures 1 and 2 of the drawings two sets of devices are illustrated.

It is in connection with a smallware loom that I will now describe my improved devices and their operation.

Fig. 1 shows in front elevation part of a loom provided with my improved devices for forming the warp loops. Fig. 2 shows similar parts in plan. Fig. 3 represents a jacquard device for operating the heddles of the loom and also for effecting the operations of the pile loop forming device. Fig. 4 shows part of such a device in front elevation. Fig. 5 illustrates in side elevation mechanism by which the movement of the pile forming wire may be effected in a direction parallel to the warps. Fig. 6 is a front elevation of such a wire and the parts to which it is attached. Fig. 7 is a plan of such

a wire and its directly operating parts and shows how the wire may be moved both along the warps and across them. Fig. 8 is a sectional view illustrating the connections between the jacquard mechanism and the loom, as well as the proper accessories for working the cross slides.

Upon the breast bar *a* or other convenient part of the loom frame is mounted a slide *b* which is in guides or on rollers and is capable of being moved in a to and fro longitudinal direction across the loom. Secured to the slide is a frame *c* provided with rods or equivalents upon which is mounted a sliding carriage *d* capable of being moved by itself in a direction about parallel to the warps, and also capable of partaking in the movement of the slide to which it is attached in a direction across the loom. Attached to this sliding carriage or to an extension therefrom is a suitably shaped wire *e*, which, following the movements of the slide *b* and the sliding carriage *d* may be moved both along and across the warps or in either direction separately so as to form the warp piles by being inserted in the shed as wires are at present inserted by hand.

Below the breast beam is pivoted a rocking shaft *f* which has angular motion imparted to it through an arm *g* which is connected by a cord, chain, or the like to supplemental hooks and griff bars or similar part which is brought into action by the jacquard or like mechanism and is indicated by *h* in Figs. 3 and 4 and is vertically reciprocated by a cord attached to a lever *j* operated from the crank or tappet shaft and by a spring or weight. As indicated, the hook *k*, adapted to operate through suitable cords the rocking shaft *f*, may be brought into or placed out of engagement with the griff bar through jacquard mechanism *l* of the well known construction. Also secured to the rocking shaft is an arm *m* the upper end of which is provided with a long pin *r* which engages behind the rear face of the sliding carriage *d* so that when the rocking shaft is actuated from the supplemental hooks and griff bars the arm moves and places the sliding carriage and its accessories in the position indicated by the dotted lines in Fig. 5 and as indicated by 2 in Fig. 7.

The slide *b* may be moved in one direction across the loom by means of a cord *n* passing over suitable pulleys and attaching it to a suitable jacquard hook as at *o* in Fig. 3, and its return may be effected by a duplicate or

similar cord attached to another jacquard lifting hook. This movement of the slide across the loom puts the wire e in either of the two positions shown in 2 and 3 in Fig. 7.

5 The warp threads in which the pile pattern is to be formed according to this invention are represented by p and they may comprise all the warps in a fabric or may be edged by other warps which are woven in the usual
10 manner or to any desired figured or other pattern. t is the harness through the mail of which the warp threads p pass, the different threads being raised or lowered by the jacquard hooks according to the holes in
15 the pattern card in the usual manner. As shown in this figure a cord n is attached to the left hand end of the cross slide b and a cord n^x to the right hand end. These cords pass over pulleys v and v^x attached to the
20 breast beam downwards to one side of double armed levers u and u^x , the other side of which is joined by a chain or the like which is slack at s to the jacquard hooks o for working the cross slide. As shown in the
25 drawing the slide b is in its extreme left hand position. If now the hook o is raised, the slide b is moved towards the right and the pile wire e is put across the warp p . If it is desired to withdraw the wire e from the fabric
30 the hook o^x is raised and the slide is thereby moved from the right to the left. The forward motion of the wire in order to bring it in position opposite the "shed" is effected by means of the mouse trap h to the hook
35 of which the cord w is attached which is connected to the lever g on the rocking shaft f carrying the propeller arm m for the wire carriage.

When it is desired to form a loop or loops
40 in the fabric the sliding carriage d which has been normally standing in the position shown by the full lines in Figs. 5 and 7 is moved along in the direction of the length of the warps until it occupies the position shown by
45 the dotted lines in those figures and so that the wire e , which is suitably proportioned and shaped for forming a warp loop, is opposite to the shed in the position shown by 2 in Fig. 7. The cross slide b is then moved in a direc-
50 tion across the fabric and the frame and sliding carriage attached to it are moved with it so that the wire enters the shed and occupies the position inside the shed formed in the warp threads as indicated by the numeral 3 in
55 Fig. 7. The radial arm m owing to its only making contact by the pin r behind the rear face of the sliding carriage, has now, owing to its release from the supplemental hooks and griff bars been withdrawn entirely from the sliding
60 carriage, and the wire and the sliding carriage d to which it is attached are free to be moved by the reed into the "fell" of the cloth on the next beat of the lathe, and as the "shed" is closed the loop or loops is or are formed
65 around the wire. As further picks are made

the wire and the sliding carriage move with the cloth in the direction of the arrow shown in Fig. 7. When sufficient movement has taken place or when the wire is again required it is withdrawn from the loop or loops
70 by a reverse movement of the cross slide. The wire is then in position for a repetition of the movements already described.

It is highly important that the movement
75 of the slide b and the sliding carriage inwards or transversely to bring the wire e to the position indicated by the numeral 3 in Fig. 7 should not be effected until the shed is fully open and when the slide b is operated
80 from or by the same jacquard mechanism as the heddles, this may be accomplished by forming the cord n by which the slide b is operated with a certain amount of surplus length as indicated at s in Fig. 3, so that the
85 slide is not moved until a certain lift of the different hooks has taken place. The travel of the slide is of course thus of less length than the stroke of the hooks. The relative movements of the sliding carriage and the
90 slide should be, that the sliding carriage is first moved to its outer position as shown by the dotted lines in Figs. 5 and 7 and then the slide should be moved to insert the wire in the shed as indicated at 3 in Fig. 7.

Although I have described my improve-
95 ments as relating only to one wire and its sliding carriage and slide arranged in connection with one edge of a fabric and although one such wire only may be used if
100 desired, two are preferred to be used one on each edge of the fabric and each provided with its cross slide and sliding carriage, the necessary operating and other parts being
105 duplicated where necessary or as required. With two such wires any one wire may be left longer in the shed before it is removed to form another loop and thus each loop may be more firmly bound in place. With two
110 such wires it is preferred to bring them into use alternately from opposite edges of the fabric. Two such sets of slides, sliding carriages, and wires in combination with one
115 fabric are shown in Figs. 1 and 2 and parts which are the equivalents or duplicates of the parts already described are indicated by the same letter of reference with the addition of a numeral 1; thus the second slide is indicated at b^1 and so on. Similarly three
120 or more wires may be employed, arranged two or more on each or either side of the fabric and preferably arranged above and below the cloth on any one edge, the wires being suitably cranked, bent or shaped to enter the "shed".

The supplemental hooks and griff bars,
125 and jacquard mechanism generally is of the usual construction and is well known. It will be well known to any one skilled in the art to so form the cards as to bring the wires
130 into operation as desired to form any de-

sired pattern. The shedding is effected in the usual manner.

As is usual and well known with wires which have hitherto been used for forming warp piles, the ends of the wires may be formed as knives or with cutting edges, so that as a wire is withdrawn the loops which have been formed round it are cut. The loops may be left as loops in the pattern or they may be cut in the ordinary manner.

Having now described my invention what I claim and desire to secure by Letters Patent is:—

1. In a loom for weaving pile or loop designs, a loop forming wire movable laterally to and also parallel to the warps, jacquard mechanism for operating and controlling the movement of such loop forming wire, means connecting said jacquard mechanism and the wire by which said wire is moved directly transversely to the warps, supplemental hooks and griff bars for operating the wire parallel to the warps, a cam for reciprocating such supplemental hooks and griff bars, and a connection between the supplemental hooks and griff bars and the jacquard mechanism for throwing said supplemental hooks

and griff bars in and out of action, substantially as described.

2. In a loom for weaving pile or loop designs, a loop forming wire movable both laterally to and parallel to the warps, jacquard mechanism for operating and controlling the movement of such loop forming wire, a flexible connection between said jacquard mechanism and the wire adapted to move such wire transversely of the warps, a slack length in said flexible connection, supplemental hooks and griff bars for operating the wire parallel to the warps, a cam for reciprocating said supplemental hooks and griff bars, and a connection between the supplemental hooks and griff bars and the jacquard mechanism arranged to throw said supplemental hooks and griff bars into and out of action, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES BERNARD WHITE.

Witnesses:

WILLIAM GEO. HEYS,
J. O'CONNELL.