

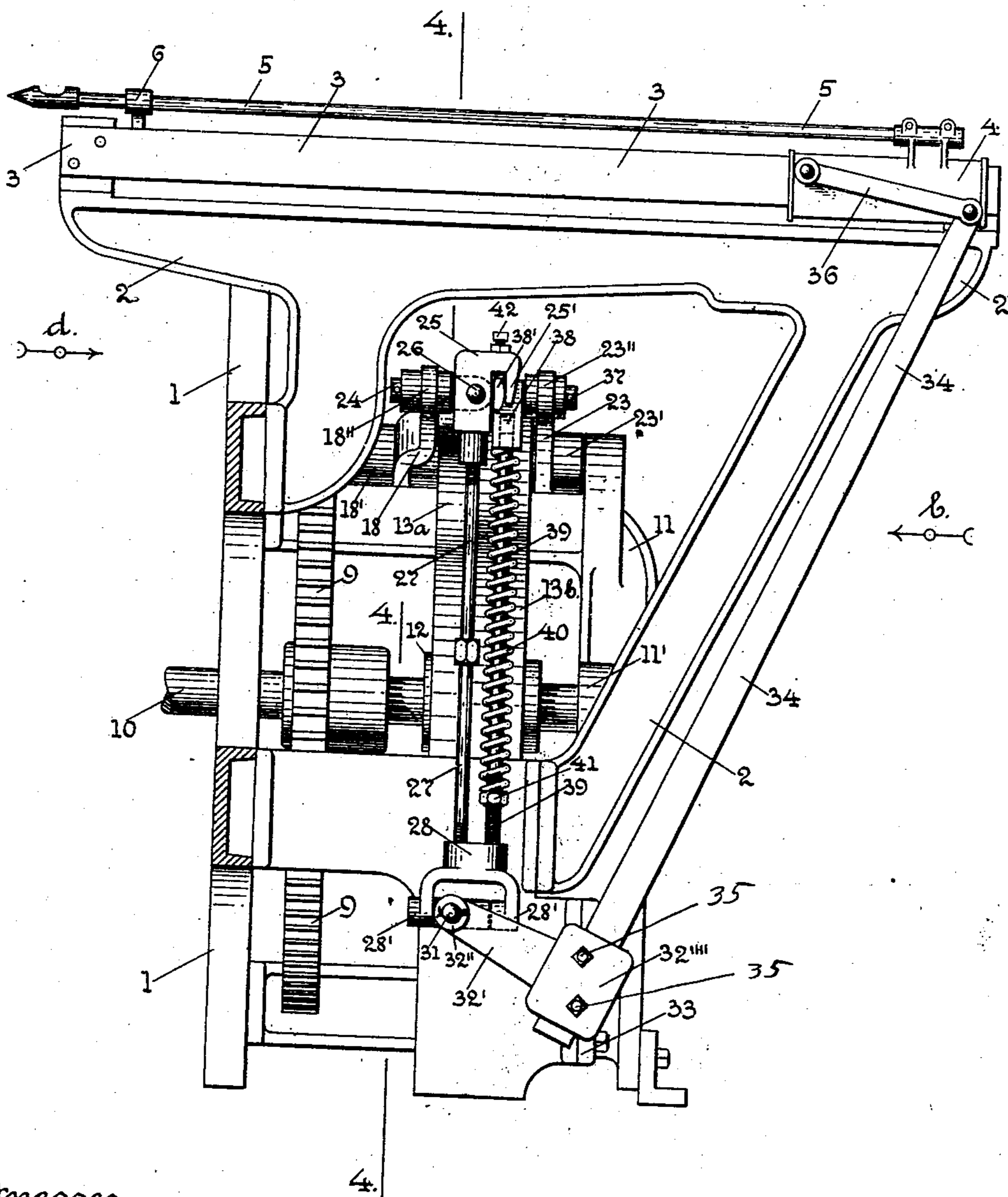
J. A. CLARK.  
 NEEDLE MOTION FOR PILE FABRIC LOOMS.  
 APPLICATION FILED JUNE 26, 1907.

912,648.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



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Fig. 3.

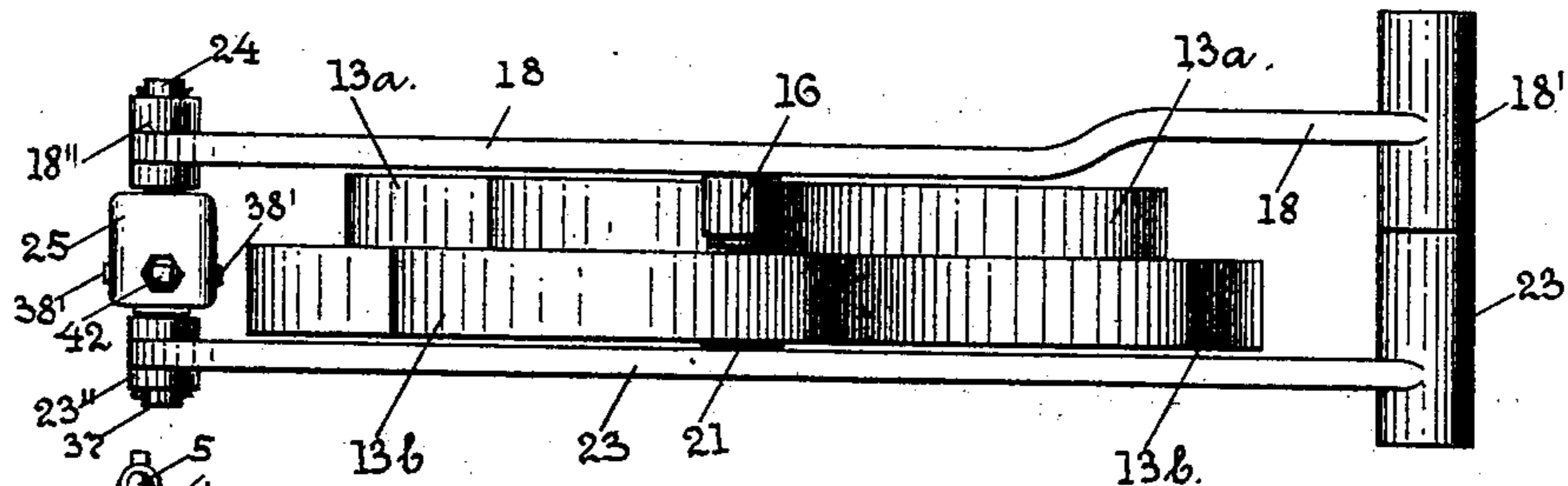
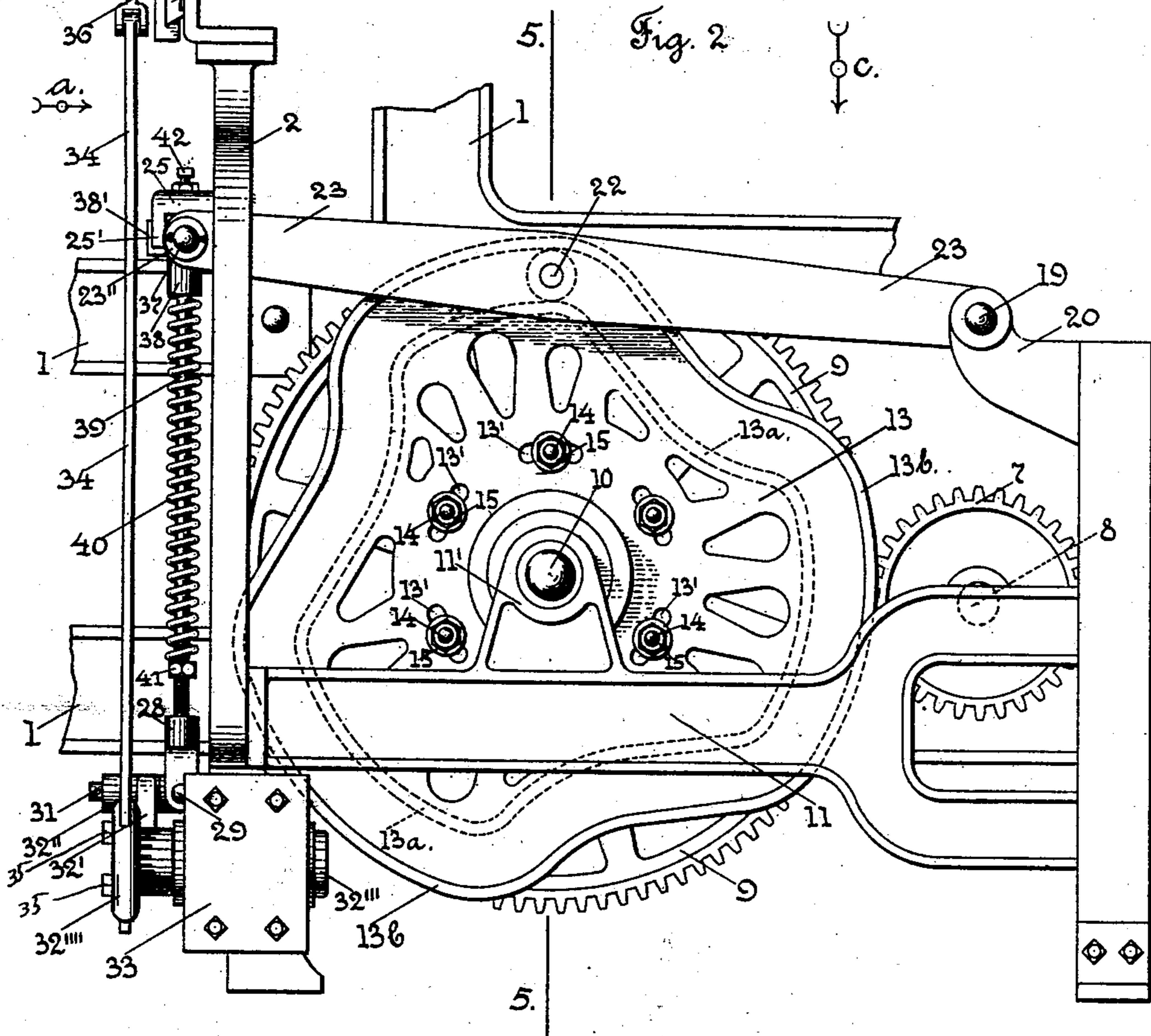


Fig. 2.



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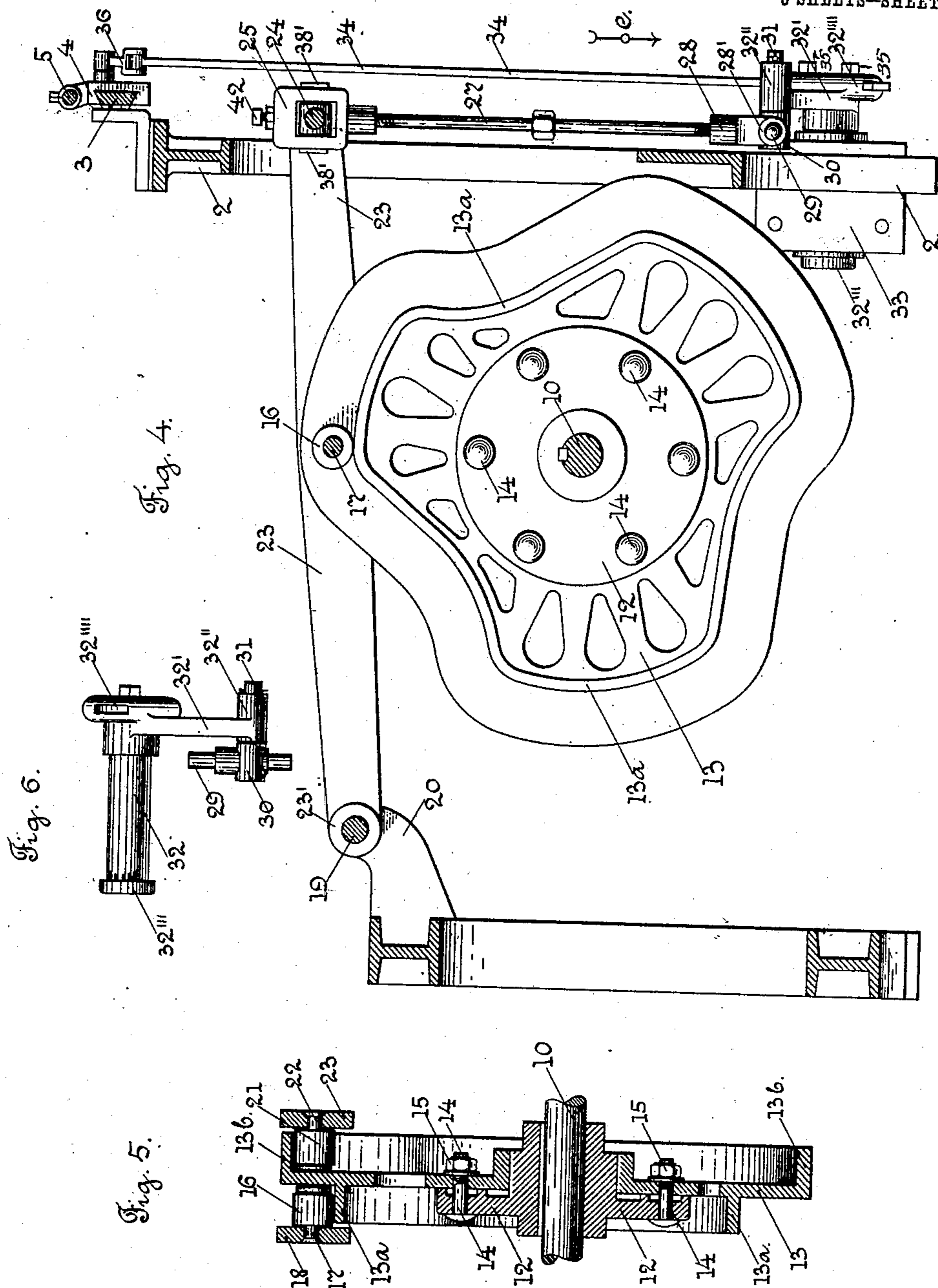
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JOHN A. CLARK, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES  
LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

## NEEDLE-MOTION FOR PILE-FABRIC LOOMS.

No. 912,648.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed June 26, 1907. Serial No. 380,894.

*To all whom it may concern:*

Be it known that I, JOHN A. CLARK, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Needle-Motions for Pile-Fabric Looms, of which the following is a specification.

My invention relates to a needle motion for pile fabric looms, and to that class of needle motions shown and described in U. S. Letters Patent, No. 668,597, in which the needle which carries the weft or filling thread is inserted and withdrawn from one side of the loom, and in which the swinging needle lever is operated by a cam mechanism.

My invention particularly relates to improvements in the cam mechanism for operating the swinging needle lever.

The object of my invention is to improve upon the cam mechanism for operating the swinging needle lever as ordinarily made, and to insure a positive and rapid insertion and withdrawal of the needle.

In my improvements, I employ a double cam, or two cam surfaces forming an external cam and an internal cam, and two cam levers, one for each cam surface, and connections intermediate said levers and the swinging needle lever.

I have only shown in the drawings a detached portion of a loom frame, and of a needle motion embodying my improvements for pile fabric looms, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a sectional front view of a needle motion embodying my improvements, looking in the direction of arrow *a*, Fig. 2. Fig. 2 is an end view of the parts shown in Fig. 1, looking in the direction of arrow *b*, same figure. Fig. 3 is a plan view of the double cam, and the two cam levers, detached, looking in the direction of arrow *c*, Fig. 2. Fig. 4 is a section, on line 4, 4, Fig. 1, looking in the direction of arrow *d*, same figure. Fig. 5 is a section, on line 5, 5, Fig. 2, looking in the direction of arrow *a*, same figure, and Fig. 6 is the support of the swinging lever, detached, looking in the direction of arrow *e*, Fig. 4.

In the accompanying drawings, 1 is a portion of a loom side or frame, 2 is a stand

bolted to the loom side and carrying on its upper part the needle rail 3 for the needle carriage 4, to which is secured the outer end of the needle 5; the inner end of the needle 5 is in this instance supported in a guide 6.

All of the above mentioned parts may be of the usual and well known construction.

I will now describe my improvements.

A pinion 7 on a shaft 8 is driven by a pinion, not shown, on the bottom shaft, not shown, and meshes with and drives a gear 9 fast on a shaft 10, which is mounted at one end in a bearing 11' on a stand 11, and suitably mounted at its other end, not shown. On the shaft 10 is also fast, in this instance, a disk 12, see Figs. 4 and 5. To the outer face of the disk 12 is adjustably secured, in a rotatable direction, a double cam 13, by bolts 14 which extend through elongated slots or openings 13' in the cam 13, see Fig. 2, and nuts 15 screwed onto said bolts. The double cam 13 forms an external and an internal cam, and has in this instance on its inner face a projecting flange or rib 13<sup>a</sup>, forming in this instance a peripheral or external cam surface, and on its outer face, at its outer edge or periphery, a projecting flange or rib 13<sup>b</sup>, forming an internal cam surface. The external cam surface 13<sup>a</sup> is for a roll 16 mounted on a stud 17 on a cam lever 18, having a hub 18' pivotally mounted on a stud 19 on a stand 20, see Fig. 2. The internal cam surface 13<sup>b</sup> is for a roll 21 mounted on a pin 22 on a second cam lever 23, the hub 23' of which is also pivotally mounted on the stud 19 on the stand 20.

The outer end of the cam lever 18 has thereon a boss or hub 18'' in which is loosely mounted to rotate therein, a stud 24. The outer end of the stud 24 has a rod head 25 secured thereto, in this instance by a pin 26, see Fig. 1. To the rod head 25 is secured the upper end of a connector 27; the lower end of the connector 27 is secured to a cross head 28, which is fork shaped at its lower end, and has the two hub portions 28', through which extends a stud or pin 29, see Fig. 4. On the pin 29 is loosely mounted a hub 30 having thereon a stud or pin 31 on which is pivotally mounted the hub or boss 32'' on an arm 32' made integral with a stud 32, which is journaled to rock in a box or bearing 33.

On the inner end of the stud 32 is an

enlarged end 32''' and on the front end of the stud 32 is a flat surface or plate 32'''' which is cored out to receive the lower end of the swinging needle lever 34 which is secured by two set screws 35. The stud 32, arm 32', and plate 32'''' are all made integral, see Fig. 6, so that there is an absolutely rigid connection between the stud or pin 31 on the cross head 28, and the swinging needle lever 34, and there can be no working loose of the parts, as might be the case if they were made separate. The upper end of the swinging needle lever 34 is connected by a link 36 with the needle carriage 4, in the usual way. The second cam lever 23 has at its outer end a boss or hub 23'', in which is rotatably mounted a stud 37. On the inner end of the stud 37 is fast a rod head 38. The rod head 38 has two ears or extensions 38' thereon, which are engaged by two hook shaped projections 25' on the rod head 25, see Figs. 1, and 2. The hook shaped projections 25' engaging the ears 38' act to hold the two rod heads 25 and 38 together, and in proper relative position without interfering with the independent movement of each cam lever 18 and 23. Into an opening in the other end of the rod head 38 loosely extends the upper end of a connector 39; the lower end of said connector 39 is secured to the cross head 28.

Encircling the connector 39 is a helically coiled expansion spring 40, which bears at its lower end against a nut 41 on the connector 39, and at its upper end against the lower end of the rod head 38. The spring 40 acts to yieldingly hold the lever 23 in its raised position at its outer end, to cause the roll 21 to be yieldingly held up against the inner side of the cam surface 13<sup>b</sup> on the cam 13.

In order to prevent the spring 40 from causing the roll 21 binding or pressing too hard on the internal cam surface 13<sup>b</sup>, through the expansion of said spring, I preferably use a set screw 42, which extends through a threaded hole in the upper end of the rod head 25, at the hook shaped portion, and engages with its inner end the up-

per end of the rod head 38, and limits the upward movement of the rod head 38 and the lever 23.

The operation of my improvements will be readily understood by those skilled in the art. Through the rotation of the double cam 13, having an external and an internal cam surface, both cam levers 18 and 23 move in the same direction, and one lever, as 18, acts as a pulling lever, to raise the arm 32' and move through the rocking stud 32 outwardly the swinging needle lever 34, to withdraw the needle 5, while the other lever 23 acts as a pushing lever, to push down the arm 32', through the rocking stud 32, and move inwardly the lever 34, to insert the needle 5.

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

1. In a needle motion for a loom, a cam mechanism for operating the swinging needle lever, comprising a double cam having a peripheral cam surface on one side or face, and an internal cam surface on the opposite side or face, and two cam levers extending upon opposite sides of said cam.

2. In a needle motion for a loom, a cam mechanism for operating the swinging needle lever, comprising a double cam having a peripheral cam surface on one side or face, and an internal cam surface on the opposite side or face, and two cam levers extending upon opposite sides of said cam, and connections from said levers to the swinging needle lever.

3. In a needle motion for a loom, a cam mechanism for operating the swinging needle lever, comprising a cam having an outer cam and an inner cam, and a lever for the outer cam, and a lever for the inner cam, and connections intermediate each lever and an arm connected with the swinging needle lever, and said arm.

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Witnesses:

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