

(No Model.)

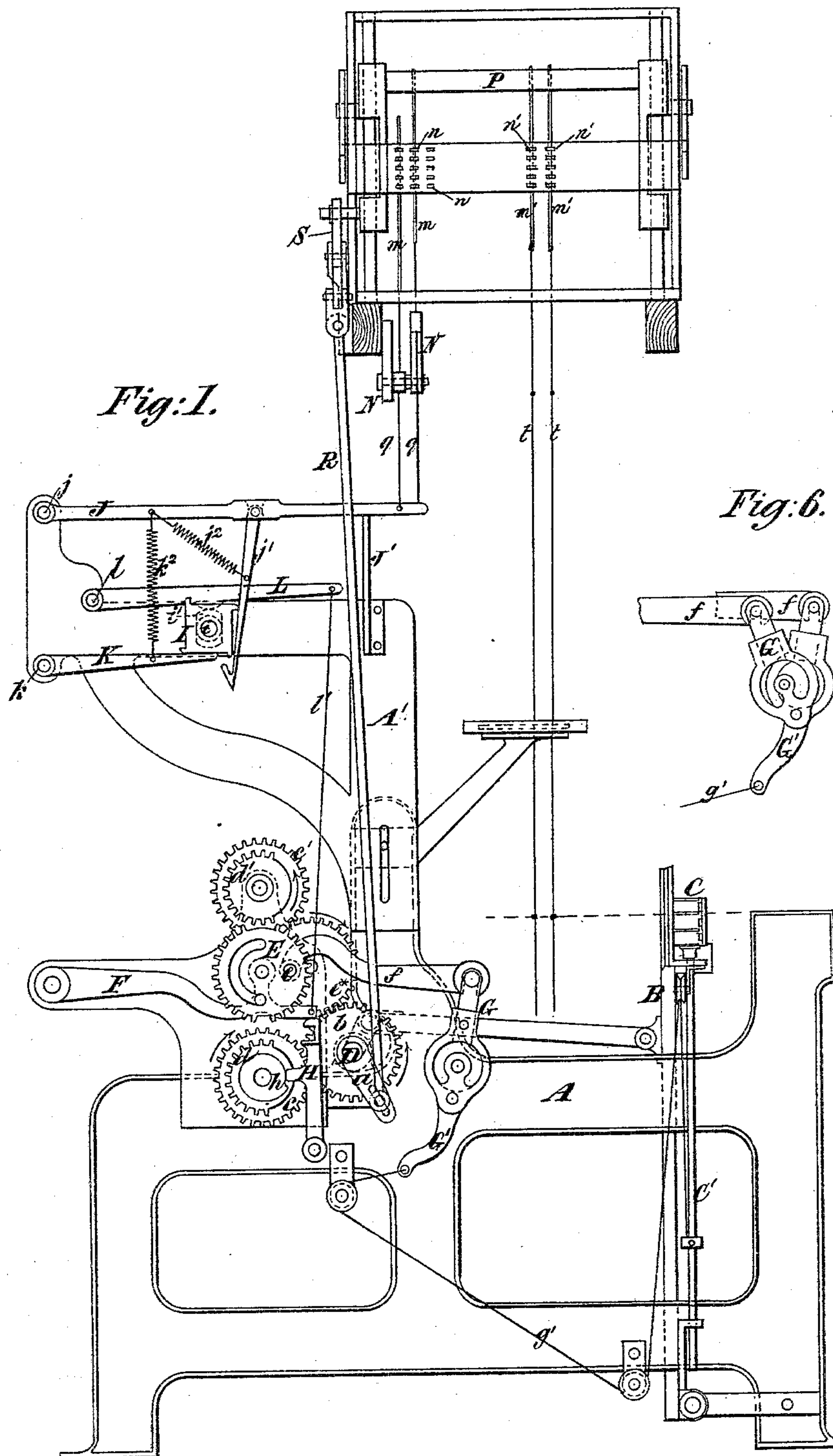
3 Sheets—Sheet 1.

E. BARTON.

MECHANISM FOR OPERATING DROP SHUTTLE BOXES IN LOOMS.

No. 414,366.

Patented Nov. 5, 1889.



Witnesses:
Emil H. Carter
O. Sundgren.

Inventor:
Edwin Barton
by his attorneys
Brown & Hall

(No Model.)

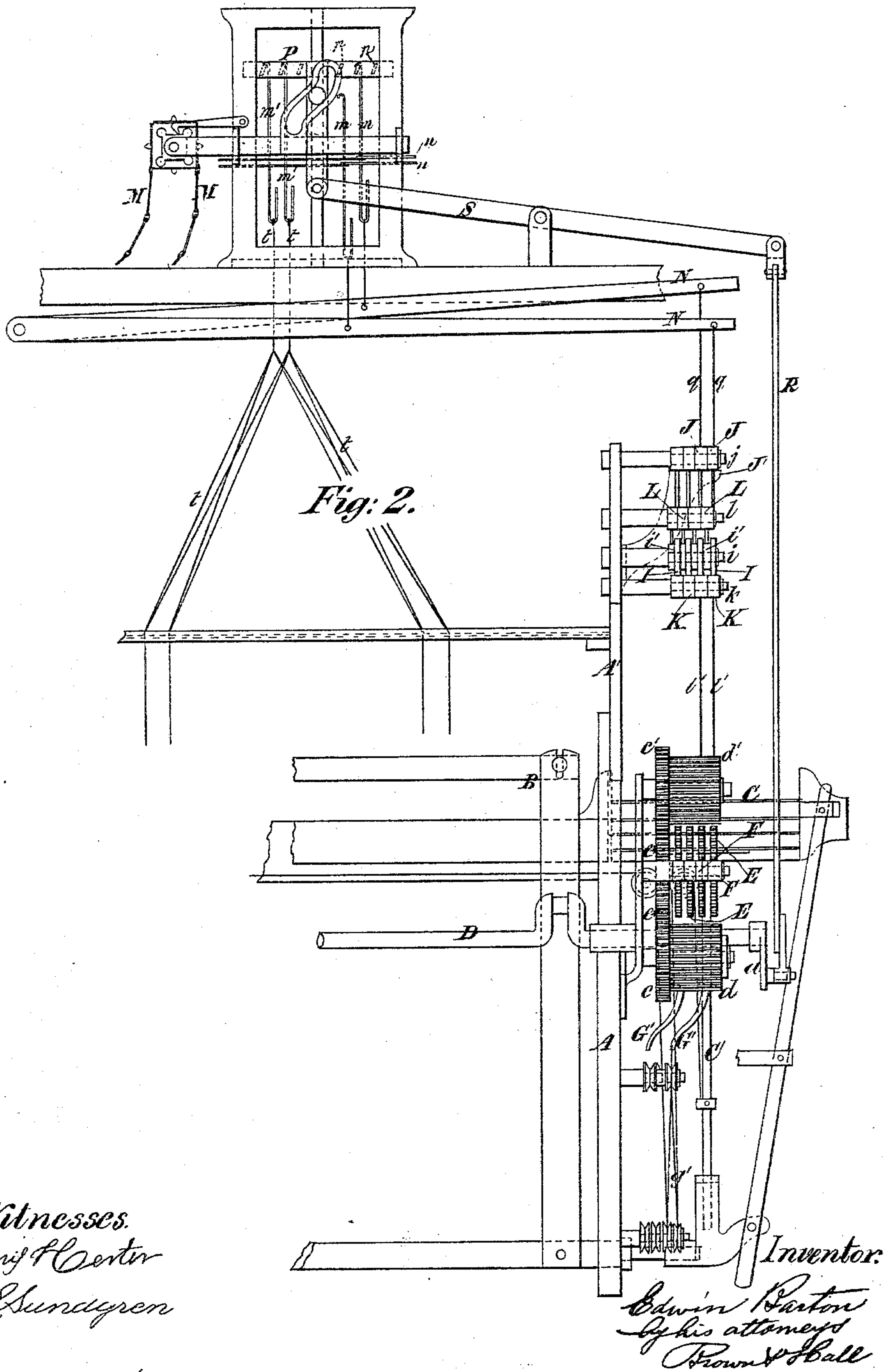
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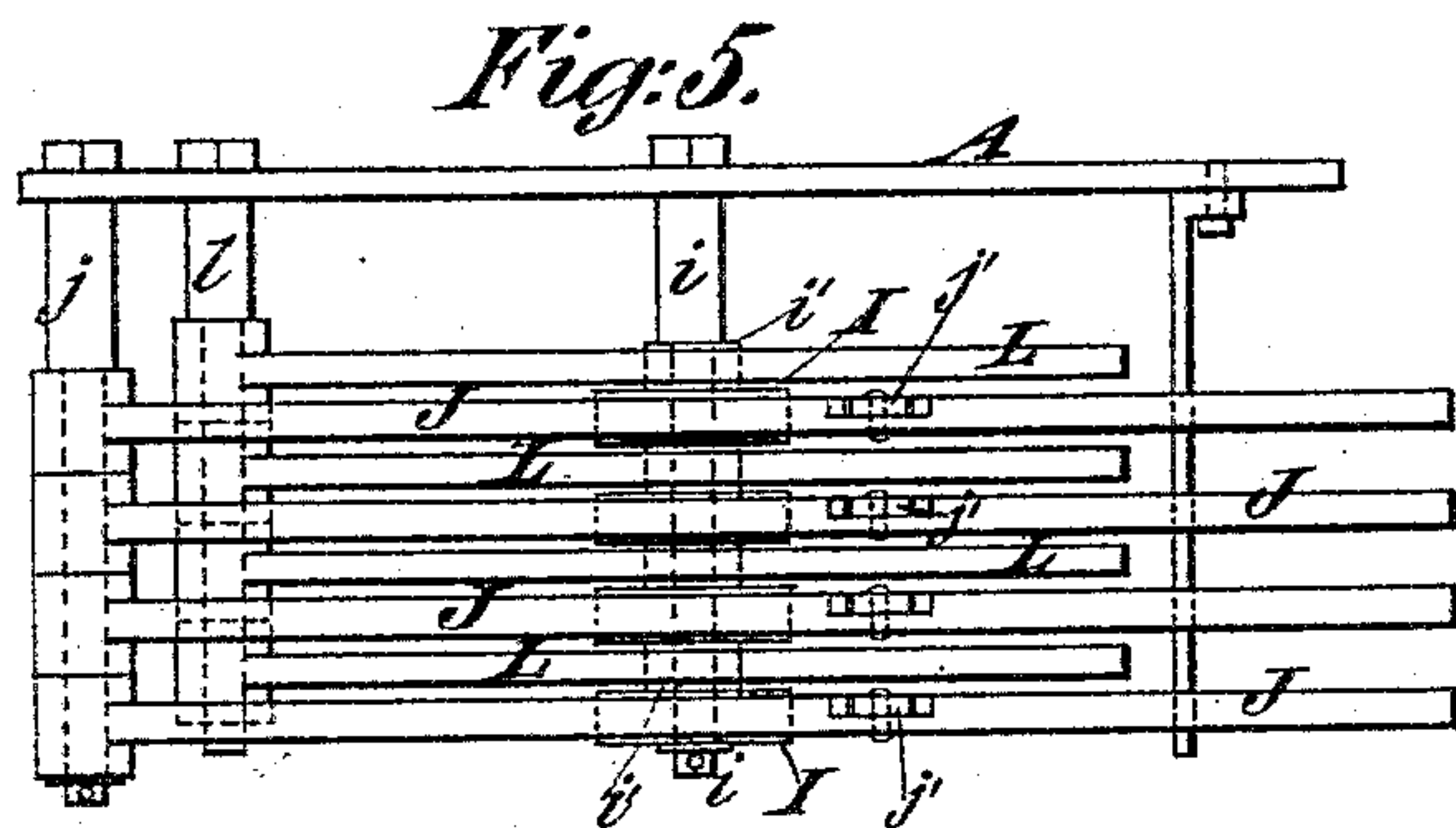
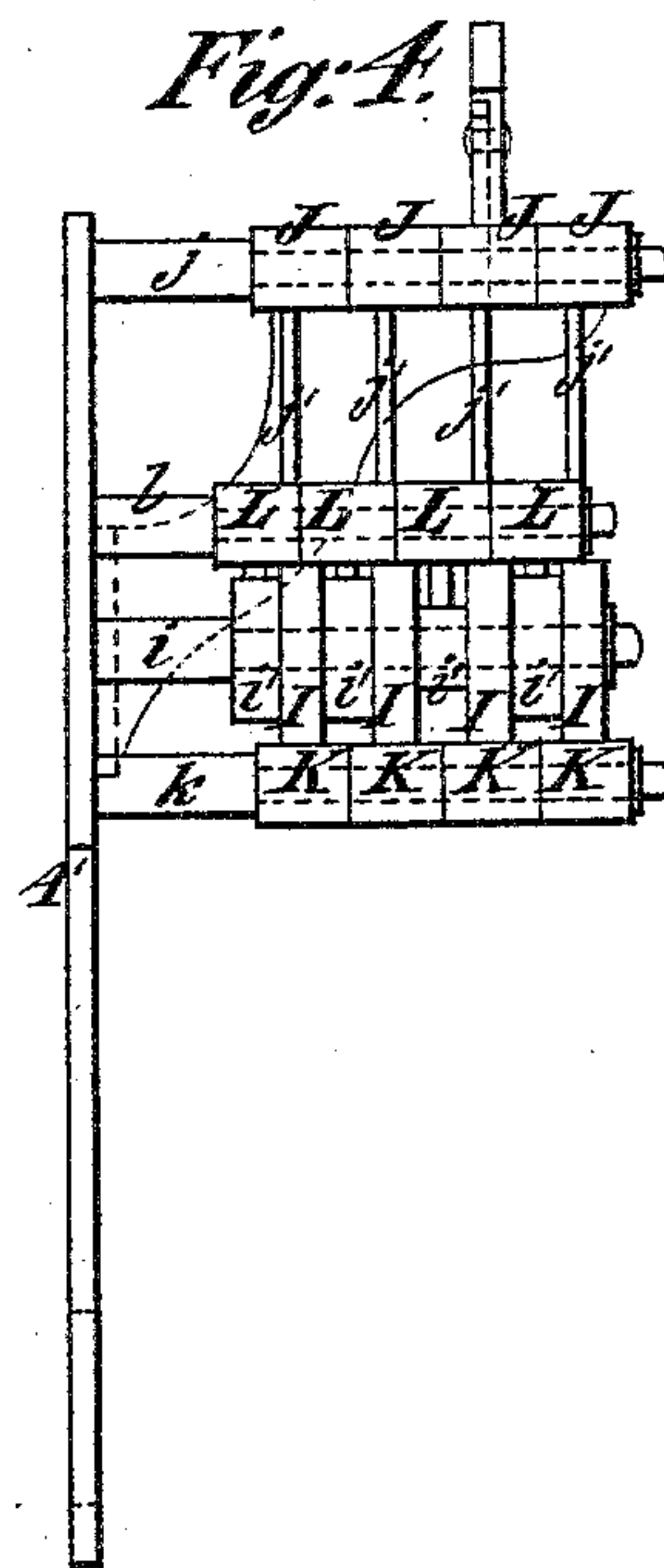
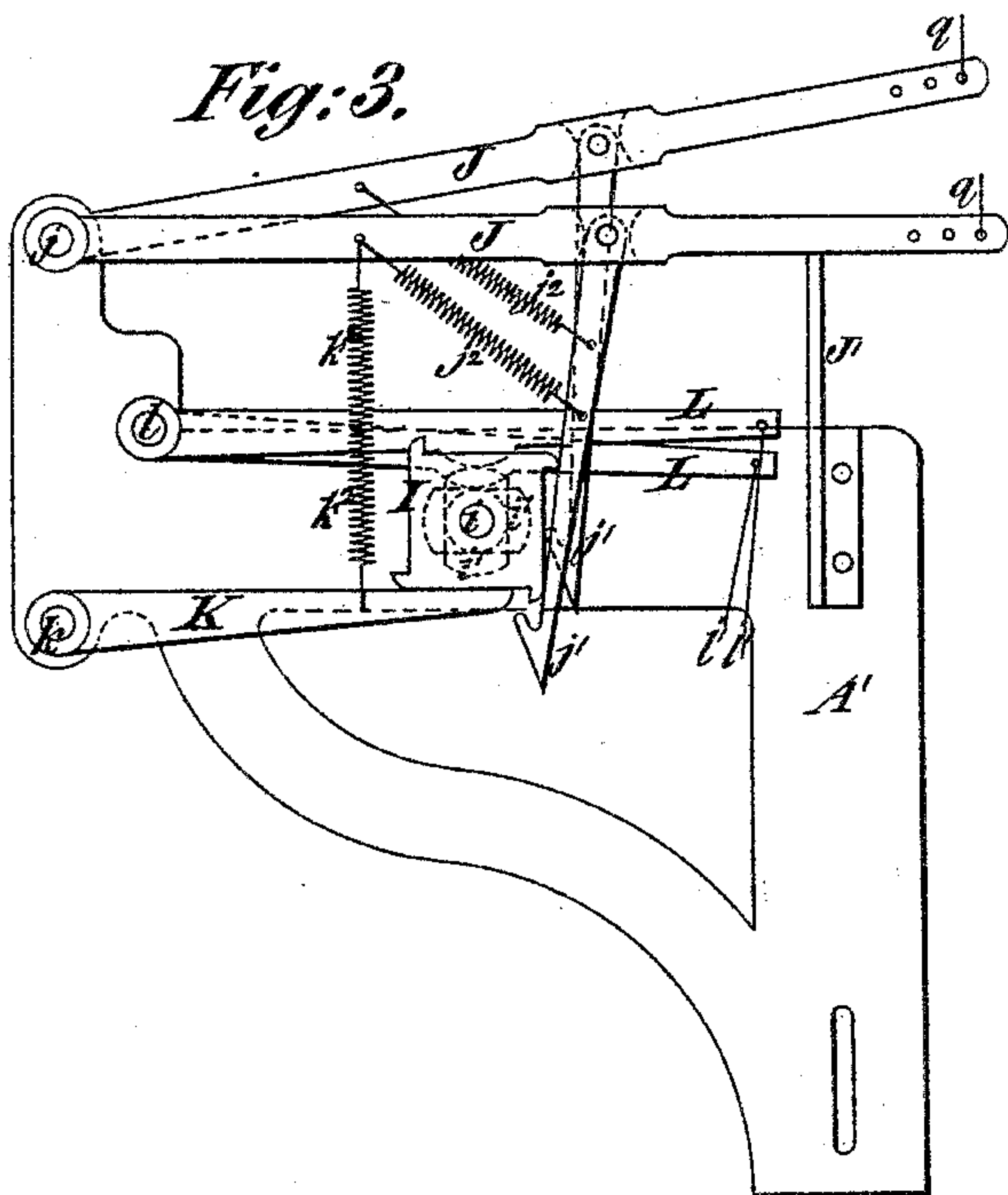
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UNITED STATES PATENT OFFICE.

EDWIN BARTON, OF PATERSON, NEW JERSEY.

MECHANISM FOR OPERATING DROP SHUTTLE-BOXES IN LOOMS.

SPECIFICATION forming part of Letters Patent No. 414,366, dated November 5, 1889.

Application filed December 22, 1885. Serial No. 186,484. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BARTON, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful
5 Improvement in Mechanism for Operating Drop Shuttle-Boxes in Looms, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the employment
10 in a loom of a Jacquard machine, which is made to control both the harness motion and the movements of the shuttle-boxes to produce the changing of shuttles.

In carrying out my invention I employ for
15 giving motion to the shuttle-boxes all of the mechanism employed in the well-known "Knowles loom," now in extensive use, such mechanism being described in several United States patents granted to Lucius J. Knowles,
20 and particularly in his patents, No. 37,760, dated February 24, 1863, and No. 134,992, dated January 21, 1873; but instead of employing a separate pattern-chain to control the movements of what are termed in the Knowles
25 loom the "vibrator-levers," which carry what are known as the "crank-gears," I employ mechanism through which the said levers are connected with the Jacquard machine, and it is this last-mentioned mechanism which con-
30 stitutes my invention.

Figure 1 in the drawings represents a side elevation of a loom having my invention applied. Fig. 2 is a rear elevation of that side
35 of the loom on which the shuttle-box motion is applied. Fig. 3 is a side view, on a larger scale than Figs. 1 and 2, of the mechanism through which the Jacquard machine controls the vibrator-levers. Fig. 4 is a rear elevation, and Fig. 5 a plan corresponding with
40 Fig. 3. Fig. 6 is a side view of one pair of the compound levers for operating the shuttle-boxes.

Similar letters of reference indicate corresponding parts in the several figures.

45 A designates the loom-framing, B the lay, and C one set of shuttle-boxes.

D designates the crank-shaft, having fast upon it, outside of the loom-framing, the crank *a*, for operating the Jacquard machine,
50 and the spur-gear *b*, for driving the shuttle-box motion. The gear *b* gears directly with the spur-gear *c*, which is fast to the lower cyl-

inder-gear *d*, and also gears, through an intermediate gear *e**, with the spur-gear *c'*, which is fast to the upper cylinder-gear *d'*, and by
55 these means constant rotary motion is imparted to the two cylinder-gears *d d'* in the directions of the arrows respectively marked upon them in Fig. 1.

E E designate the crank-gears arranged between the upper and lower cylinder-gears, where they are supported in the vibrator-levers F F, their cranks *e*, of which only one is shown, (see Fig. 1,) being connected by the
60 connectors *f f* with the upper ends of the compound levers G G', the lower ends of which are connected by cords *g'* with the posts C' of the shuttle-boxes. 65

H is the locking-lever for holding the vibrator-levers F during the pick of the shed
70 which has been set. *h* is the cam fast on the lower cylinder-gear *d*, for the purpose of throwing off the said locking-lever to permit the movements of the vibrator-levers by the Jacquard machine. 75

All the parts above described are precisely the same as in the well-known Knowles loom with drop shuttle-boxes, now in common use, and substantially as represented in the patents of Lucius J. Knowles, hereinbefore re-
80 ferred to, and therefore I only describe them sufficiently to enable me to intelligently describe the nature and operation of my own invention, which I will now proceed to describe in detail. On that side of the loom
85 from which the Jacquard machine is worked and on which the shuttle-box motion is situated there is erected on the side frame a standard A', and in this standard is secured a stud *i*, on which turn freely a number of
90 ratchet-wheels I I corresponding with the number of vibrator-levers F F, each of the said wheels having four teeth and as many intervening straight edges, and each having secured to it a cam *i'*, which is of the form of
95 a circle with two opposite segments removed, thus making two offsets, as shown in dotted outline in Figs. 1 and 3. In the same standard A' are also secured three fixed studs *j k l*, which serve as the fulcra of three sets of le-
100 vers J K L, each set corresponding in number with the wheels I and cams *i'* and with the vibrator-levers F. The levers J are furnished with hook-pawls *j'* for turning their respect-

ive ratchet-wheels I, and so turning the cams i' , the purpose of which is to raise and lower the levers L, which I call "lifting-levers," and which are connected by wires or cords l' each with one of the vibrator-levers F of the Knowles drop-box motion for the purpose of operating the said vibrator-levers and their crank-gears. The levers K operate on the straight edges of the ratchet-wheels I for the purpose of preventing them from being turned more than a quarter-revolution by the pawls j' and keeping the cams i' in the proper positions of rest to so support their respective vibrator-levers as to allow the crank-gears E severally to engage at the proper times with the upper and lower cylinder-gears d d' . Springs j^2 are applied to the pawls j' , and springs k^2 are applied to the levers K to keep them in operative relation with their respective ratchet-wheels.

The levers J, or as many of them as may be necessary, according to the number of shuttles to be used to produce the pattern, are connected with as many of the levers N of the Jacquard machine. In the example represented, although there are shown four sets of levers J K L and a corresponding number of vibrator-levers F, only two levers N are shown in the Jacquard machine, because, in order to avoid complication of the drawings, I have represented the pattern mechanism as set up to use only two shuttles for the pattern, and hence only two of the levers J are shown connected and in use. Each of the said levers N is shown connected with a hook m , which passes through one of the needles n . Besides the two shuttles used for the pattern a third is used for the ground in the upper shuttle-boxes, provided in the Jacquard machine for controlling the shuttle-box motion, the movements of the said needles to place the said hooks in or out of range of the knives p of the lifting frame or grid P of the Jacquard machine being controlled by holes and blanks provided in the same pattern-cards M as are commonly employed in the Jacquard machine for controlling the harness motion, the pattern-perforations for controlling said needles being in the portions of the cards near one end thereof, as may be understood by referring to the needles represented in Fig. 1.

The Jacquard machine being such as is commonly employed needs no particular description. It is represented in the drawings (see Figs. 1 and 2) as worked from the crank a in the usual way by a connecting-rod R

and lever S, and as having the connections made in the usual manner between the lifting frame or grid P and the cords t t of the harness by means of the hooks m' m' under the control of the needles n' n' and the proper holes in the pattern-cards.

The levers J for operating the ratchet-wheels I and cams i' , when not raised by the Jacquard machine, are supported in proper positions of readiness to be operated upon by the Jacquard machine by resting upon the horizontal upper edge of the bracket J', secured to the standard A'.

It will be understood that if all the gearing and connections of the shuttle-box-operating mechanism are properly adjusted the connection of that mechanism with the same Jacquard machine which operates and controls the harness, the harness motion, and the shuttle-box motion cannot fail to operate in timely relation with each other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the Jacquard machine, the shuttle-boxes, the vibrator-levers F, the crank-gears E, mechanism, substantially as herein described, for producing the rotation of said crank-gears, and mechanism, substantially as herein described, whereby the cranks e of said gears are connected with the shuttle-boxes, of a series of lifting-levers L, connected with said vibrator-levers, a series of cams for operating the said levers, a series of levers, pawls, and ratchets for turning the said cams, and connections, substantially as herein described, between the last-mentioned levers and the Jacquard machine, all as herein set forth.

2. The combination, with the lifting-hooks m , needles n , and levers N of the Jacquard machine, and means, substantially as herein described, for operating said hooks and needles, the shuttle-boxes, the vibrator-levers F, and crank-gears E, carried thereby, and the connections f G G' g' between said gears and the shuttle-boxes, of the lifting-levers L and connections l' , the lifting-cams i' , the ratchet-wheels I, attached to said cams, the pawl-levers J and pawls j' , for turning said ratchet-wheels and cams, and the connections q between said pawl-levers and said levers N, all substantially as herein set forth.

EDWIN BARTON.

Witnesses:

CHAS. M. KING,
ALEX. DUNLOP.