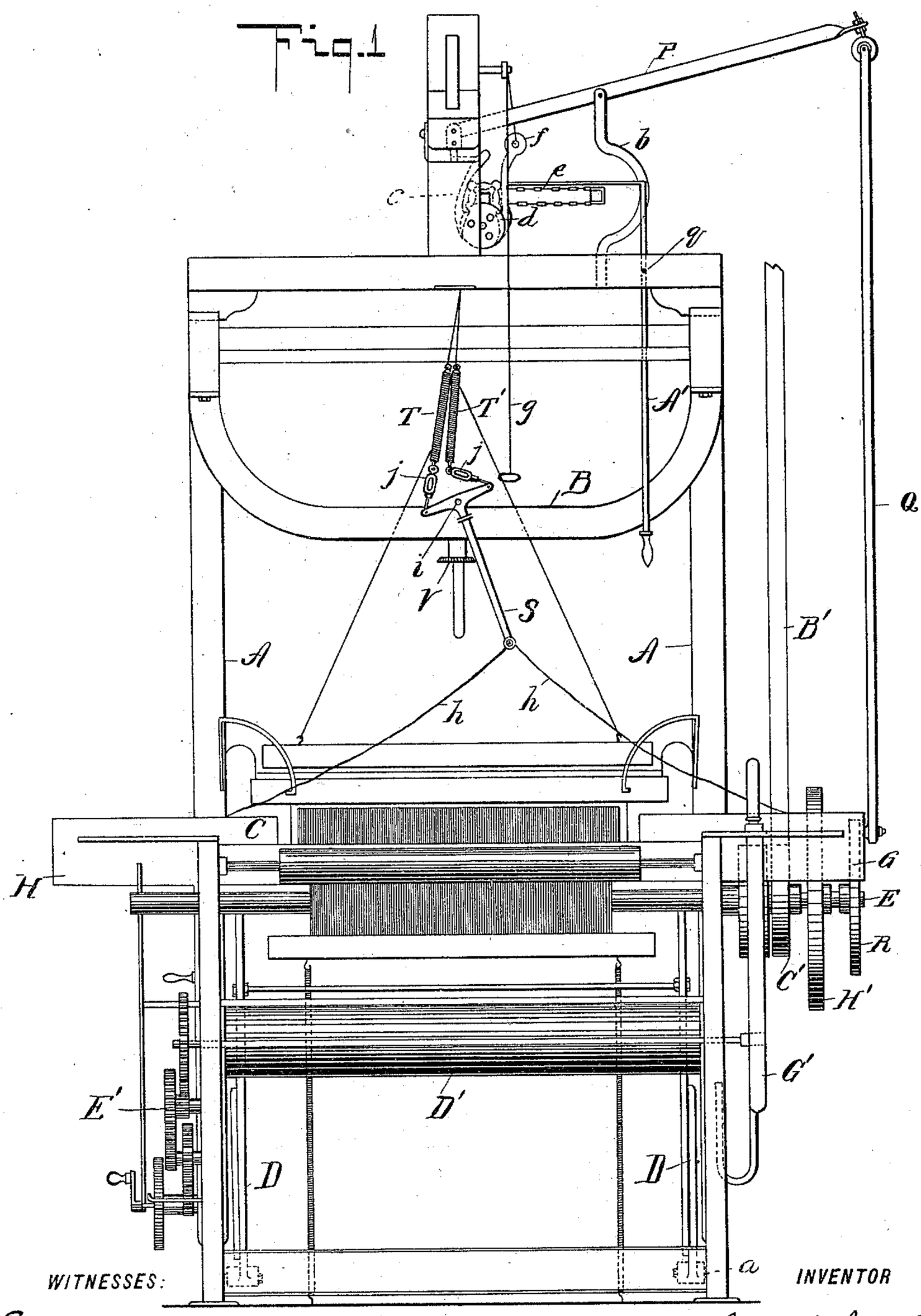
(No Model.) 3 Sheets—Sheet 1.

A. MONTI.

LOOM.

No. 559,460. Patented May 5, 1896.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

A. MONTI.

LOOM.

No. 559,460. Patented May 5, 1896.

Fig. 2

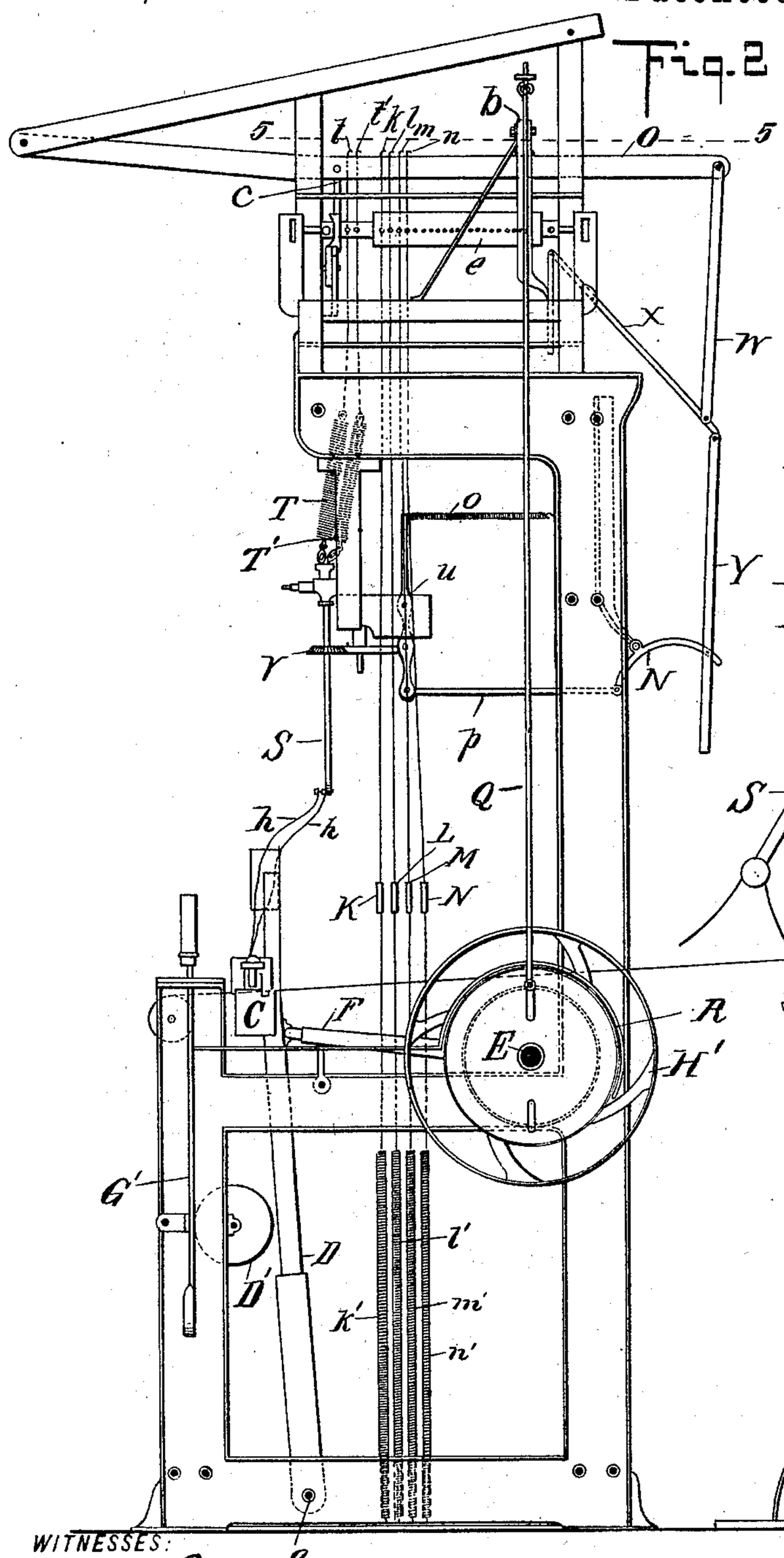
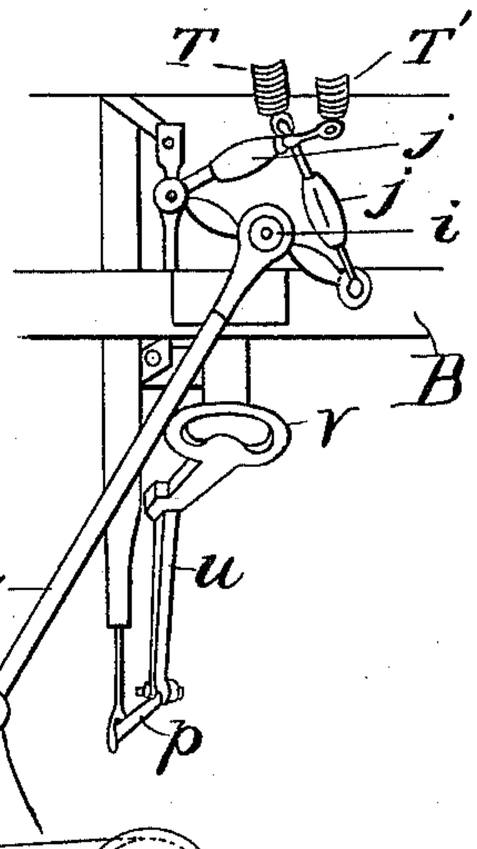


Fig. 3



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(No Model.) 3 Sheets—Sheet 3.

A. MONTI.

LOOM.

No. 559,460. Patented May 5, 1896.

Fig. 4

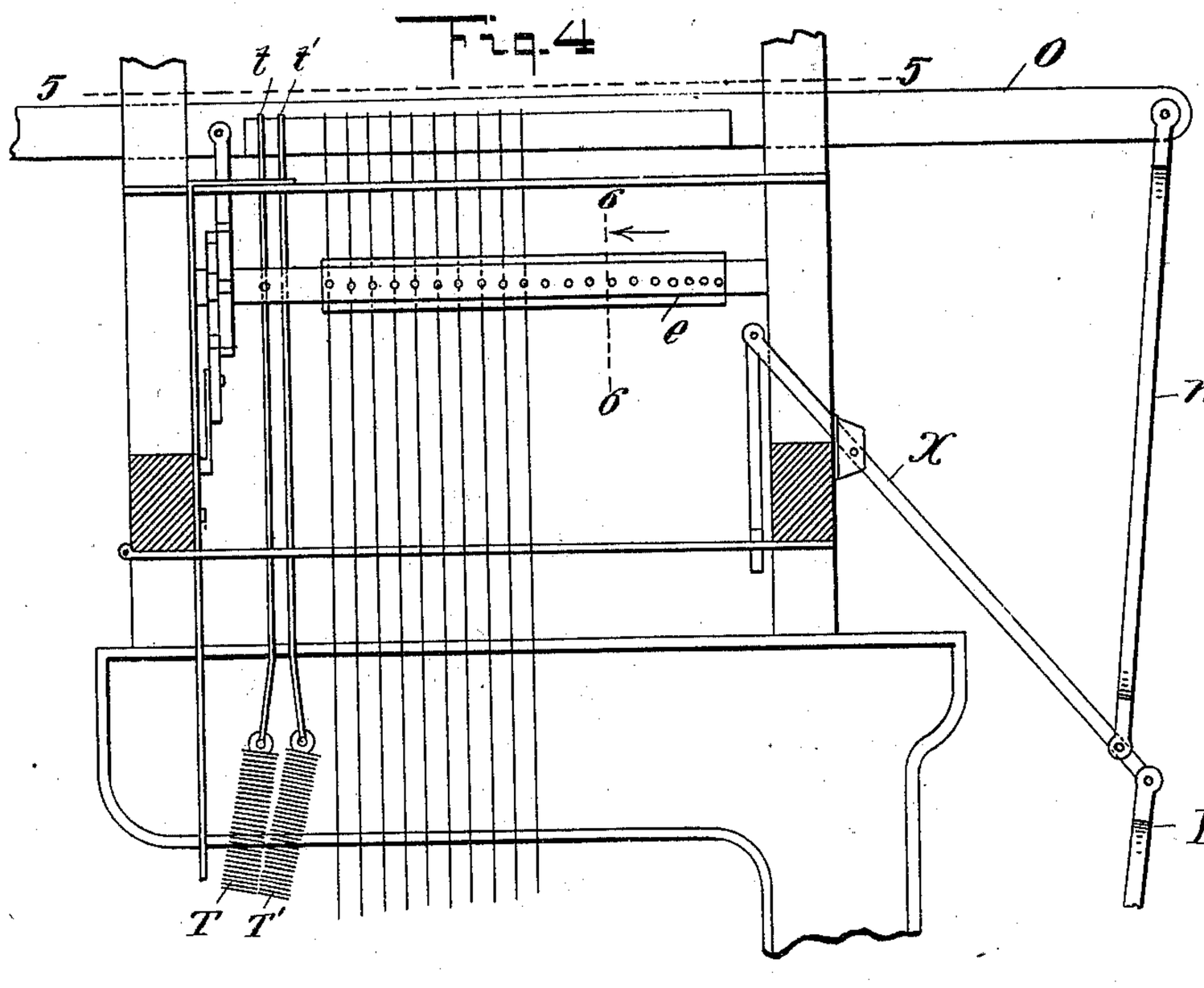


Fig. 5

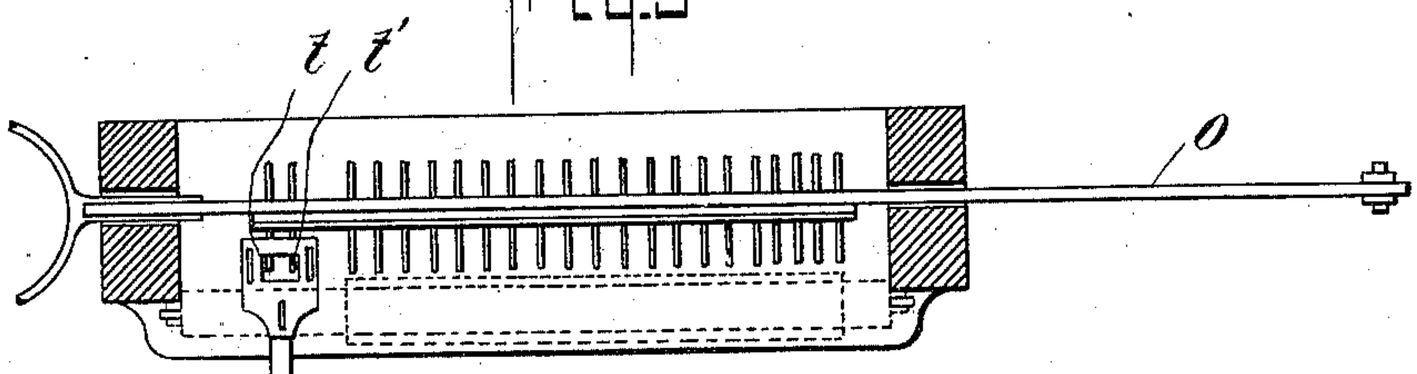
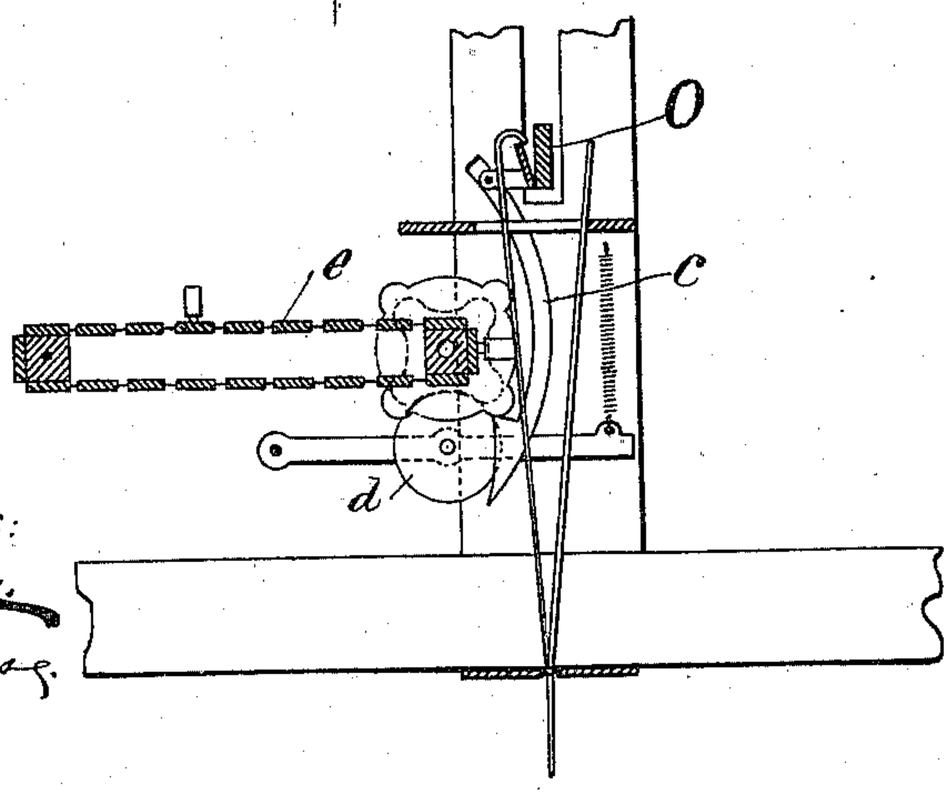


Fig. 6



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UNITED STATES PATENT OFFICE.

ANTONIO MONTI, OF COMO, ITALY, ASSIGNOR TO PAUL HELBING, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 559,460, dated May 5, 1896.

Application filed June 27, 1895. Serial No. 554,395. (No model.)

To all whom it may concern:

Be it known that I, ANTONIO MONTI, a resident of Como, Italy, have invented certain new and useful Improvements in Looms, of which the following is a specification.

My invention relates to looms, and has for its object to improve the construction thereof.

To this end my invention consists in the construction hereinafter set forth and claimed.

The main feature of this invention consists in the means for producing movement of the shuttle, which means consists in interposing springs in the whipping mechanism instead of using levers as heretofore.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a loom having my improvements applied thereto. Fig. 2 is a side elevation thereof. Fig. 3 is a detail view of the retarding device for the whipper. Fig. 4 is a side elevation, on an enlarged scale, of the upper part of Fig. 2. Fig. 5 is a sectional plan view taken on line 5 5 of Figs. 4 and 2; and Fig. 6 is a sectional elevation of the selecting and harness-lifting devices, the section being taken on line 6 6 of Fig. 4, looking in the direction of the arrow, being the opposite direction from the direction of view in Fig. 1.

A is the frame of the loom. This frame is provided with a suitable cross-bar B.

C is the loom-batten, which is supported upon swords or rods D, which are pivoted at *a*.

E is the main cam-shaft of the loom from which the batten is worked by means of a link F, which forms a connection between a cam on the shaft E and the batten C.

G H are the shuttle-boxes of the loom.

K, L, M, and N are the harnesses, which terminate at the top in certain hooks or engaging devices *k*, *l*, *m*, and *n* and at the bottom in the restoring-springs *k' l' m' n'*.

Mounted upon the loom-framing is a lifter O, which, while the loom is in operation, is continually operated by an operating-rod P, pivoted in a bracket *b* on the framework of the loom and actuated by a rod Q, attached at its lower end to a crank-disk R on the main cam-shaft E. Attached to the lifter O is a pawl *c*, which acts upon and rotates the drum of the selecting device a quarter of a revolution for every beat of the batten, thereby moving the cards of the selecting device one card at a time, the cards being maintained in the position into which they are moved by the spring-pressed brake *d*. (See Fig. 6.) Operating also upon the pawl-and-ratchet mechanism is a reversing-pawl *f*, which is controlled by means of a handle *g*, connected therewith in any suitable manner and extending down in front of the loom, as seen in Fig. 1.

Pivoted upon the cross-bar B is a T-shaped whip S, to whose lower end are attached the shuttle-propellers *h*. This whip receives a swinging motion upon its pivot *i* and whips the shuttle back and forth through the shed in a manner which will be hereinafter described. Attached to the arms of the T-shaped whip S by suitable connections, such as links *j*, are springs T T', to which are connected the hooks or lifters *t t'*, which are adapted to be engaged with the lifter O. The engagement of the various hooks *k l m n t t'* is effected by the selecting device, the engagement being effected for every beat of the loom. Pivoted to the cross-bar is a lever *u*, to one end of which is connected a restoring-spring *o* and to the other end a link *p*. Somewhere in the length of the pivoted lever *u* is a stop V, which is preferably in the shape of a heart-cam, as shown in Fig. 3. Depending from the rear end of the lifter O is a link W, which is attached to a link X, which is in turn attached to a link Y, the said link Y being pivoted to a pivoted curved lever N, which is itself connected to the rear end of the rod *p*. Thus at every upward movement of the lifter O the stop V will be moved out of the path of the whip S after the same has been placed under tension of one of the springs to allow said whip to operate, the time of such removal being regulated by regulating the various connections between the lifter O and the stop V. This regulation may be variously effected by adjusting the parts, which adjustment may be done while the loom is in operation by stopping the motion of the whip, as will be explained. Pivoted at *q* on the frame A is a lever A', which is apertured at the end, so as

to embrace the hooks *t t'*, (see Fig. 5,) so as to effect their engagement with or disengagement from the lifter O as the lever moves the hooks into or out of the path of the lifter. The office of this lever A' is to prevent the lifter from moving the whip when desired, so that the adjustment of the stop V may be effected, and for other reasons.

The operation of my device is in detail as follows: For every beat of the batten produced by the cam through the medium of a belt B' and pulley C' on the main shaft E the desired sets of harness are selected for movement by means of the selecting device. At the same time the selecting device selects one or the other of the hooks *t t'* for engagement with the lifter, so that by this means the shed is opened and one of the springs of the whip S is placed under tension, and when the stop is withdrawn from the path of the whip it is swung on its pivot by the spring under tension, and pulling upon one or the other of the cords *h* propels the shuttle through the shed.

The timing of the withdrawal of the stop is such that the stop will be withdrawn from contact with the whip as the shed is opened for the passage of the shuttle. When the shuttle has passed through the shed, it comes into the opposite shuttle-box, running into the shuttle-propeller near the mouth of the shed, which propeller accompanies the shuttle into the box so as to retard the motion thereof and bring it to rest gradually, thus preventing shock. This is the action of the loom in detail during one beat. Succeeding beats will be similar, the selecting devices operating to select the proper hooks for engagement with the lifter, the lifter serving to move the harnesses and to place one of the springs of the whip under tension and also to allow the stop to remain in position until the proper movement has come for the shuttle to be thrown, when it will be withdrawn by the action of the lifter and its connecting-levers, as described.

It will of course be understood that the loom is also provided with various other operating parts; but I do not deem it necessary to here describe them in detail, as they are well understood. For instance, I have shown a take-up drum D' and an automatically-regulated take-up mechanism E' particularly adapted for use with the hereinbefore-mentioned parts. With these parts is also combined a belt-shifter G' and a hand-wheel H'.

It will be quite obvious that this invention is capable of many mutations; and now, while I have described this invention in specific terms, I would have it understood that I do not mean to thereby limit myself to the matters herein set up and described, as the construction may be greatly varied by those who may desire to enjoy the fruits of my invention.

It will be observed that by my invention I am enabled to provide a loom which is simple in construction, wherein there is little liability of the parts getting out of order, and in which the whipping mechanism can be readily thrown out of action without stopping the loom.

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

1. In a loom, the combination with shedding mechanism and means for operating the same, of a spring-actuated whip, and means for connecting and disconnecting the whip with the means for operating the shedding mechanism, whereby the whip may be thrown out of operation without stopping the shedding mechanism.

2. In a loom, the combination with shedding mechanism and means for operating the same, of a spring-actuated whip, means adapted to connect or disconnect a spring which actuates the whip with the means for operating the shedding mechanism to place said spring under tension, and a movable stop connected with and operated by the shedding mechanism to hold the whip while tension is being applied to an actuating-spring thereof, substantially as described.

3. In a loom, the combination of shedding mechanism, a continually-operating lifter, means connected with the shedding mechanism for engaging it with the lifter, a selecting device for determining such engagement, a spring-actuated whip, means for engaging a spring of the whip with the lifter to place said spring under tension, and a movable stop for the whip also operated by the lifter, substantially as described.

ANTONIO MONTI.

Witnesses:
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SALA PIETRO.