

No. 645,637.

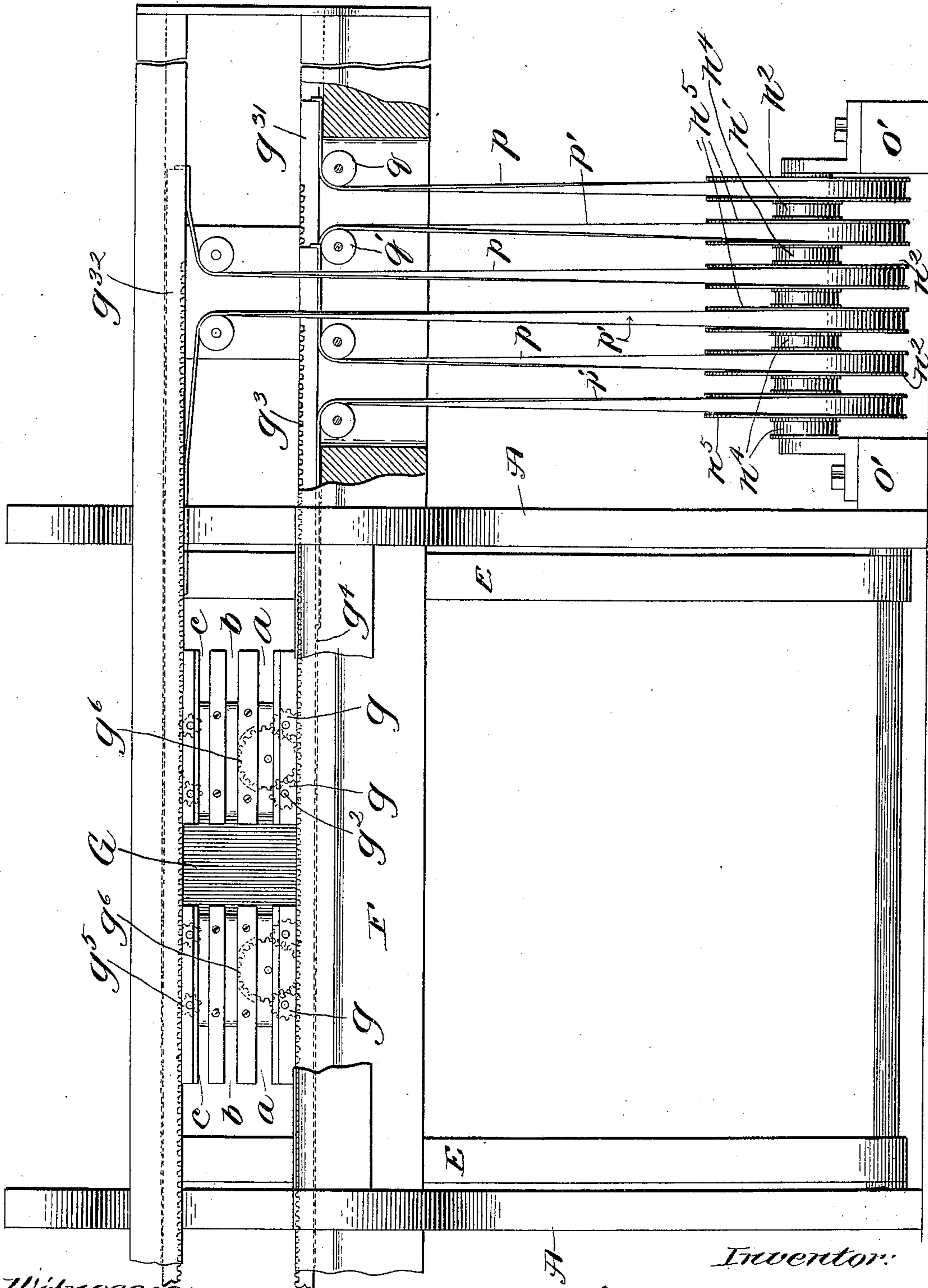
Patented Mar. 20, 1900.

C. ALVORD.
LOOM.

(Application filed July 19, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

Arthur F. Randall.
Ethel M. Winward

Fig. 1.

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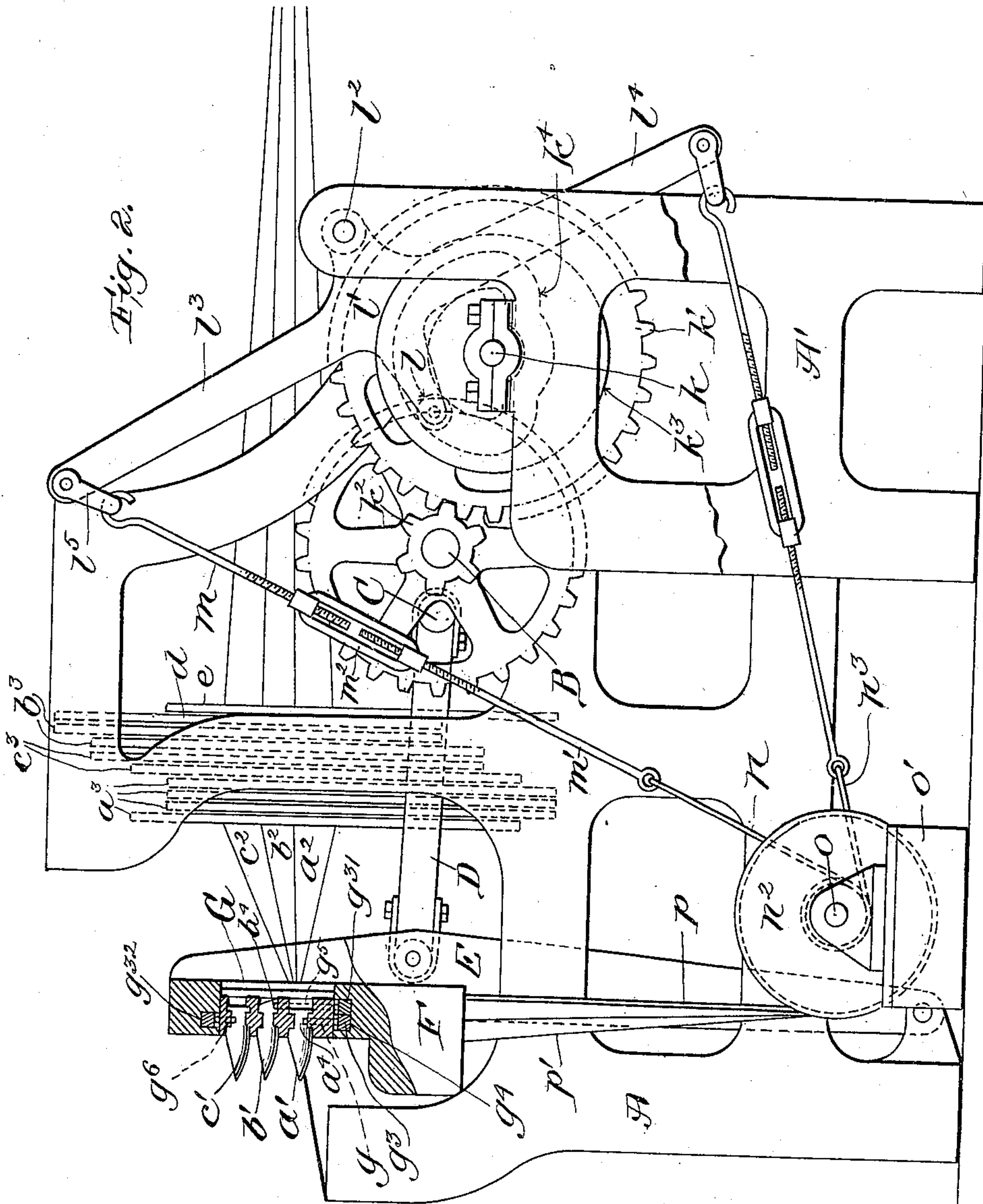
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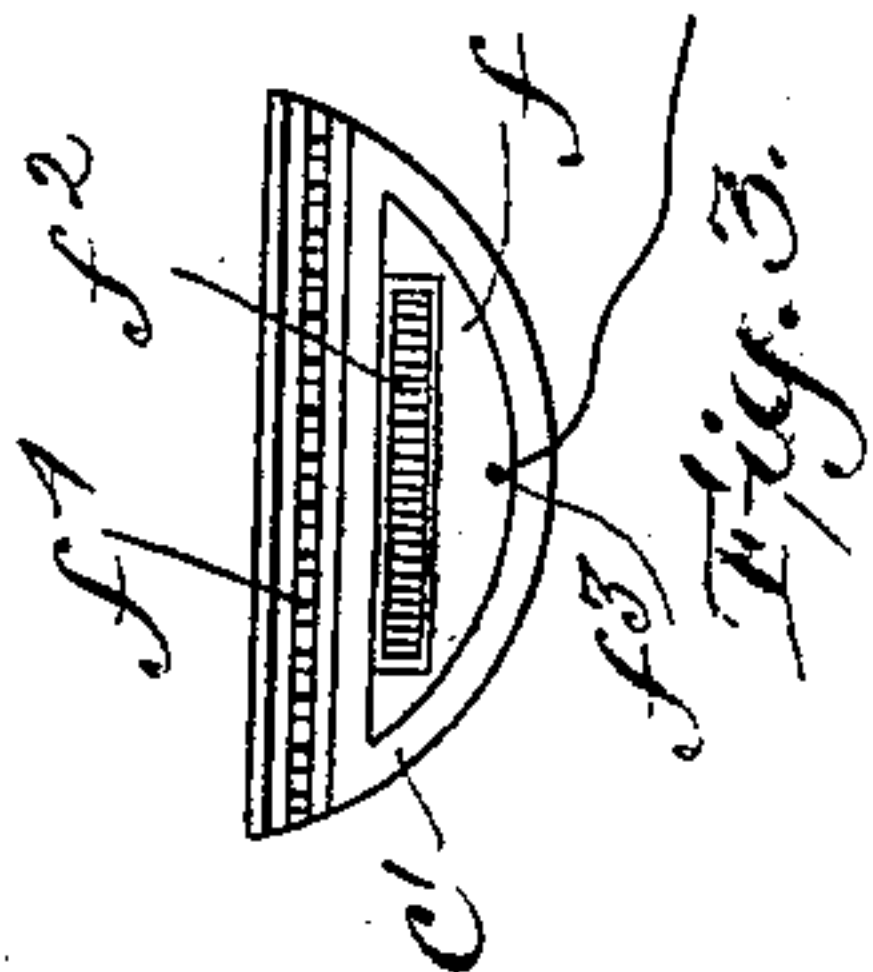
(Application filed July 19, 1899.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CLINTON ALVORD, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PRESTON HOSE AND TIRE COMPANY, OF MAINE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 645,637, dated March 20, 1900.

Application filed July 19, 1899. Serial No. 724,342. (No model.)

To all whom it may concern:

Be it known that I, CLINTON ALVORD, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Looms, of which the following is a specification.

This invention consists of a loom having a lay provided with a plurality of shuttle-races, shuttles mounted therein, each of said shuttles operatively connected with an independently-operated shuttle-actuating rack, and means for operating each of said racks to positively operate said shuttles, all as hereinafter more fully set forth in the following description, and the novel features of which are particularly pointed out and clearly defined in the claims at the close thereof.

In the following description reference is had to the accompanying drawings and to the letters marked thereon, like letters designating the same parts or features throughout the several views.

Of the drawings, Figure 1 is a front elevation of a loom embodying this invention, portions thereof being represented as broken away to more clearly illustrate the invention. Fig. 2 is a side elevation of the loom shown in Fig. 1. Fig. 3 is a detail of one of the shuttles.

Referring to the drawings, A represents the frame of a loom, B the driving or crank shaft journaled therein, and C one of the cranks to which is connected one end of a link D, the opposite end of which is connected with the lay E. The lay-beam F is provided with a reed or batten G, at each side of which are located shuttle-races $a\ b\ c$, within which are arranged the shuttles $a'\ b'\ c'$, respectively. The shed for the shuttle a' is represented at a^2 , and the harness-frames a^3 control the warp-threads which form this shed. The shed for the shuttle b' is represented at b^2 , and the harness-frames b^3 control the warp-threads which form this shed. The shed for the shuttle c' is represented at c^2 , and the harness-frames c^3 control the warp-threads which form this shed.

The three shuttles $a'\ b'\ c'$ operate to each weave a separate fabric independent of the other shuttles, and in order to unite the fabric produced by the shuttle b' with the fabric

produced by the shuttle a' an independently-controlled set of warps are incorporated in the fabric, which stitch the two fabrics together, and said stitching-warps are controlled by a harness-frame e , which is so operated that the shuttle b' lays its weft under said stitching-warps, and said frame e is then lowered, so that the shuttle a' lays its weft over said stitching-warps, and then said warps are raised up, so as to overlie and engage the weft of the shuttle b' again, and so on throughout the weaving process. The fabric produced by the shuttle c' is likewise secured to the fabric produced by the shuttle b' by means of another set of stitching-warps controlled by a harness-frame d .

In the form of my invention herein shown and described I have shown a loom equipped with three shuttles, although it is to be understood that it is within the scope of the present invention to construct a loom of this character having only two shuttles, their respective harness-frames, and an additional harness-frame adapted to control an independent set of stitching-warps which engage both weft-threads and are incorporated in the fabric during the process of weaving, or in some instances more than two shuttles may be employed.

Fig. 3 shows a plan view of the upper shuttle c' , and said shuttle is formed with a recess f for receiving the bobbin f^2 , from which latter the yarn passes out through an eye f^3 . Each shuttle is formed or provided with a rack f^4 on one side thereof, and in the shuttle c' the said rack is located on the upper side thereof. The shuttles b' and c' are also formed with racks $a^4\ b^4$, respectively, said racks being located on the under side of said shuttles.

$g\ g$ represent pinions or toothed wheels which are mounted upon pins g^2 , and the teeth of said pinions project into the shuttle-race c and are adapted to engage with the rack a^4 of the shuttle a' . The pinions g also engage with a rack g^3 , which is mounted to slide freely in a channel or way g^4 , provided in the lay-beam F, and means hereinafter described are provided whereby said rack is moved longitudinally to rotate the pinions g and through the medium of said pinions move

the shuttle a' back and forth across the batten or reed G . Similar racks g^{31} and g^{32} are likewise mounted in the lay-beam F , and said racks engage, respectively, with pinions g^6 and g^5 , which latter mesh with the racks f' and b^4 , provided on the shuttles b' and c' . Each rack is operated from the main crank-shaft B by means of mechanism which is constructed and arranged as follows:

10 Upon a frame A' is journaled a counter-shaft k , which has fixed on its inner end a gear k' , that meshes with a pinion k^2 , fixed to the crank-shaft B . Upon the shaft k are fixed three cams k^3 , each formed with a cam-slot k^4 , into each of which slots k^4 projects a cam roll or truck l , mounted upon a lever l' . Each lever l' is fulcrumed upon a bar or rod l^2 , mounted in the frame A' , and is formed with oppositely-extending arms l^3 and l^4 . The arm

15 l^3 of each lever l' has a loop l^5 loosely connected therewith at the extremity thereof, into which is hooked one end of an adjustable connection comprising the bars m m' , which are formed with right and left screw-threads and the turn-buckle m^2 , and to the opposite end of said connection one end of a flexible strap n is connected. The opposite end of the strap n embraces a drum n' , mounted to turn freely upon a bar o , which is supported by stands o' o' .

20 30 Compounded with the drum n' is a drum n^2 , to which is secured one end of a strap p , which extends upwardly over a sheaf q , mounted upon the lay, and has its opposite end secured to the end of the rack g^{31} , which operates the shuttle b' through the medium of the pinions g^6 , hereinbefore referred to, and when the strap p is drawn downwardly the rack g^{31} is moved in one direction—that is, to the left in Fig. 1. The arm l^4 of the lever l' is likewise connected with one end of a strap n^3 , the opposite end of which strap embraces a drum n^4 , mounted loosely upon the bar o . Compounded with drum n^4 is a drum n^5 , to which is secured one end of a strap p' , which extends

35 40 45 50 upwardly over a sheaf q' , mounted upon the lay, and has its opposite end secured to the rack g^{31} at a point intermediate its ends, so that when the strap p' is drawn downwardly said rack is moved to the right in Fig. 1. As the straps p and p' are controlled and oper-

ated by the opposite arms of the lever l' when said lever is moved, the drums n^2 and n^5 will be rotated in opposite directions and one of the straps p or p' will be drawn downwardly and will positively move the rack g^{31} in one direction of its movement, while the other strap will be unwound from its drum in proportion and be free to move upwardly as said rack is moved. The racks g^3 and g^{32} are each likewise connected with a lever l' , mounted upon the bar l^2 , and each of the said levers l' is actuated by a separate cam k^3 , and the different cams k^3 may be so timed that the shuttles a' b' c' may be operated in unison successively or as desired. The cams k^3 are so formed that after each movement of the lever l' , or, in other words, after each pick of the shuttle actuated thereby, there is a period of rest, during which time the batten beats the weft up against the fabric and returns for the next pick.

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

1. In a loom, the combination of a lever pivoted intermediate its ends, means for vibrating said lever, independent compound drums, strap connections between corresponding members of said drums and the opposite ends of said lever respectively, a reciprocatory shuttle-actuating slide, and straps connecting the same with the other members of said compound drums, respectively, substantially as described.

2. In a loom, the combination of one or more shuttle-actuating slides, straps connected with each slide, compound drums independently rotatable and having said straps connected respectively with corresponding members, a lever pivoted intermediate its ends, strap connections between the other corresponding members of the compound drums, respectively, and the opposite ends of said lever, and a wheel having a cam-groove occupied by a part of the lever, whereby the latter is vibrated, substantially as described.

CLINTON ALVORD.

Witnesses:

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