

I. L. PETERSON.  
LOOM.

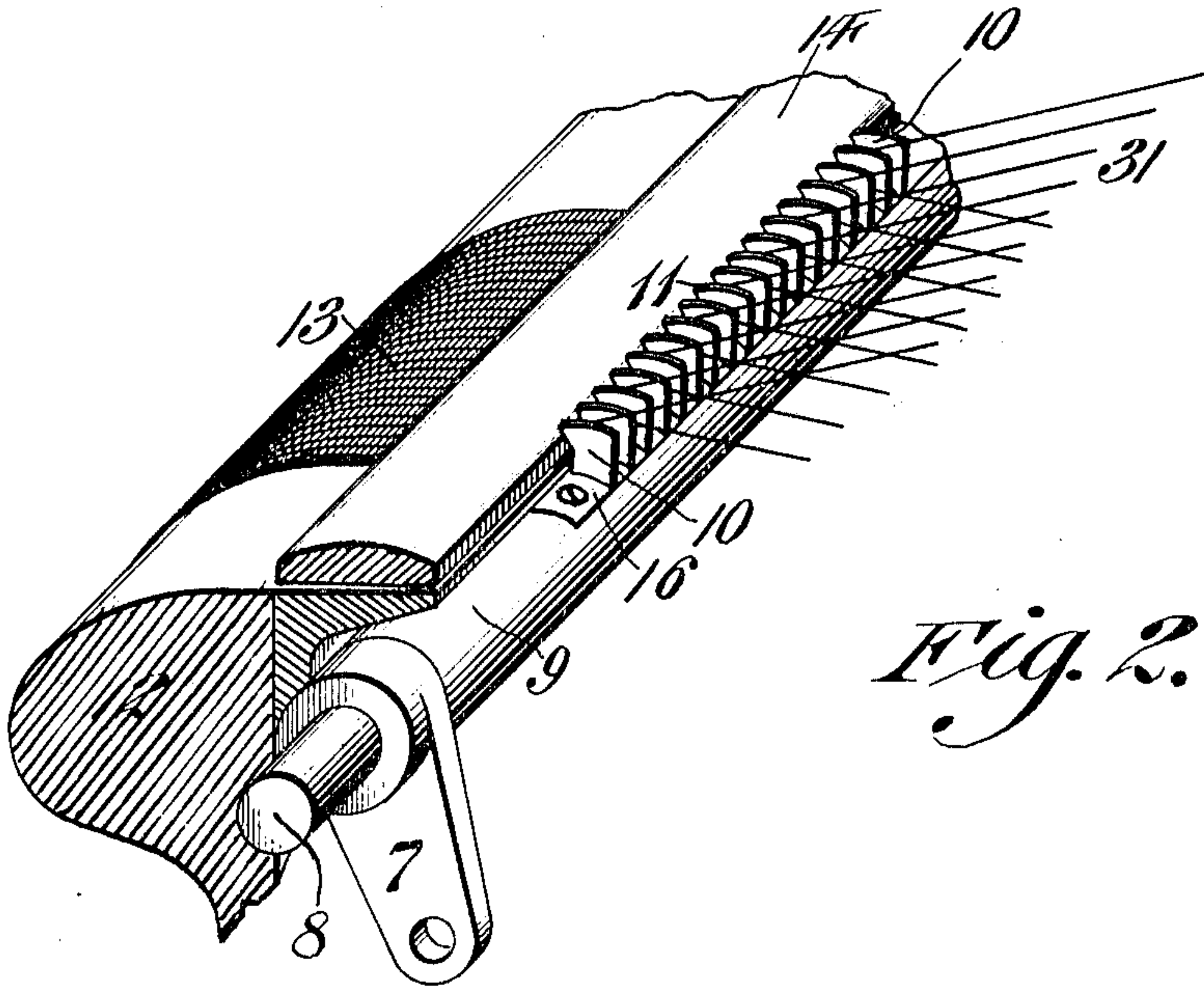
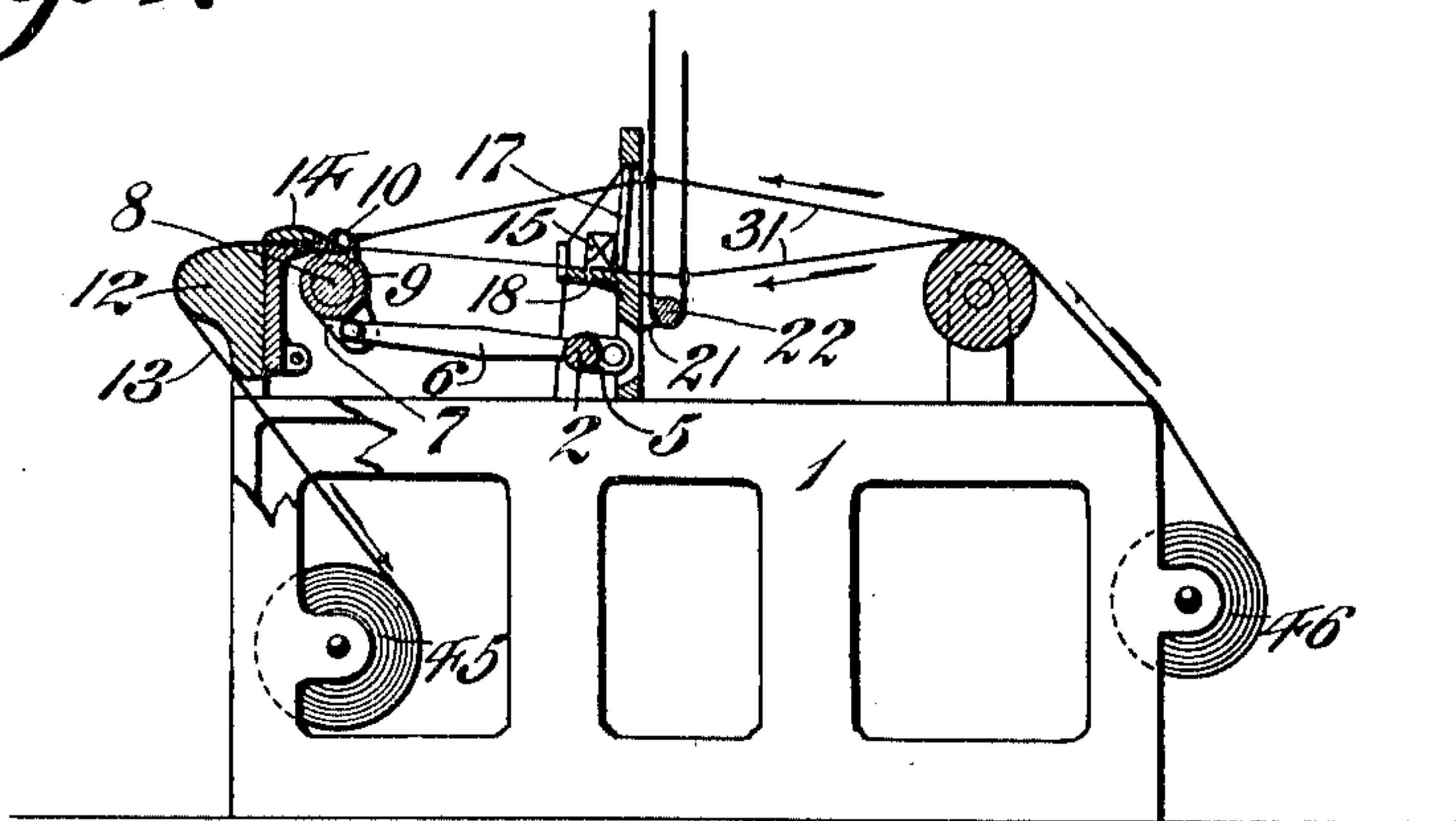
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982,862.

Patented Jan. 31, 1911.

3 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*

Witnesses

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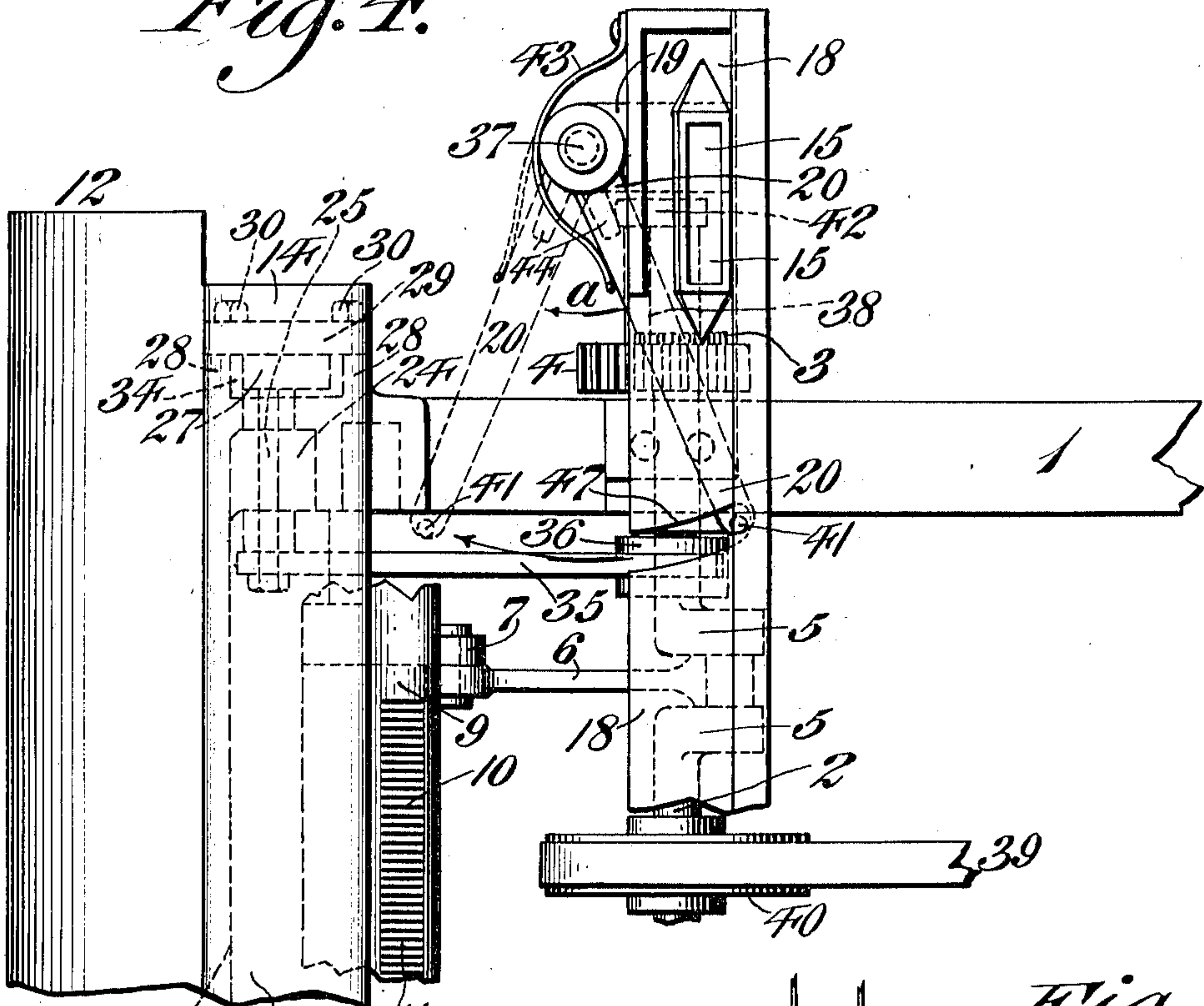
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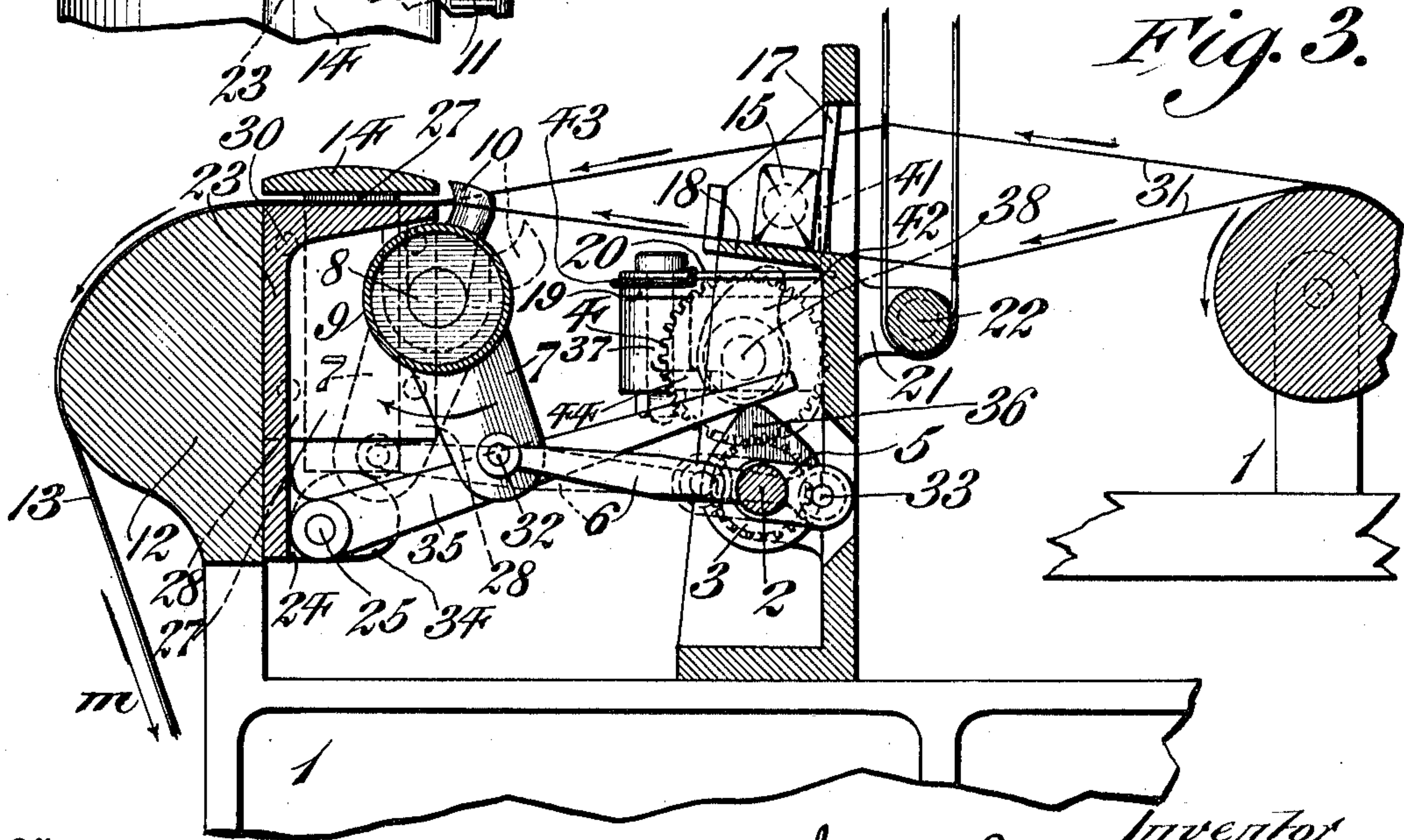
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3 SHEETS—SHEET 2.

*Fig. 4.*



*Fig. 3.*



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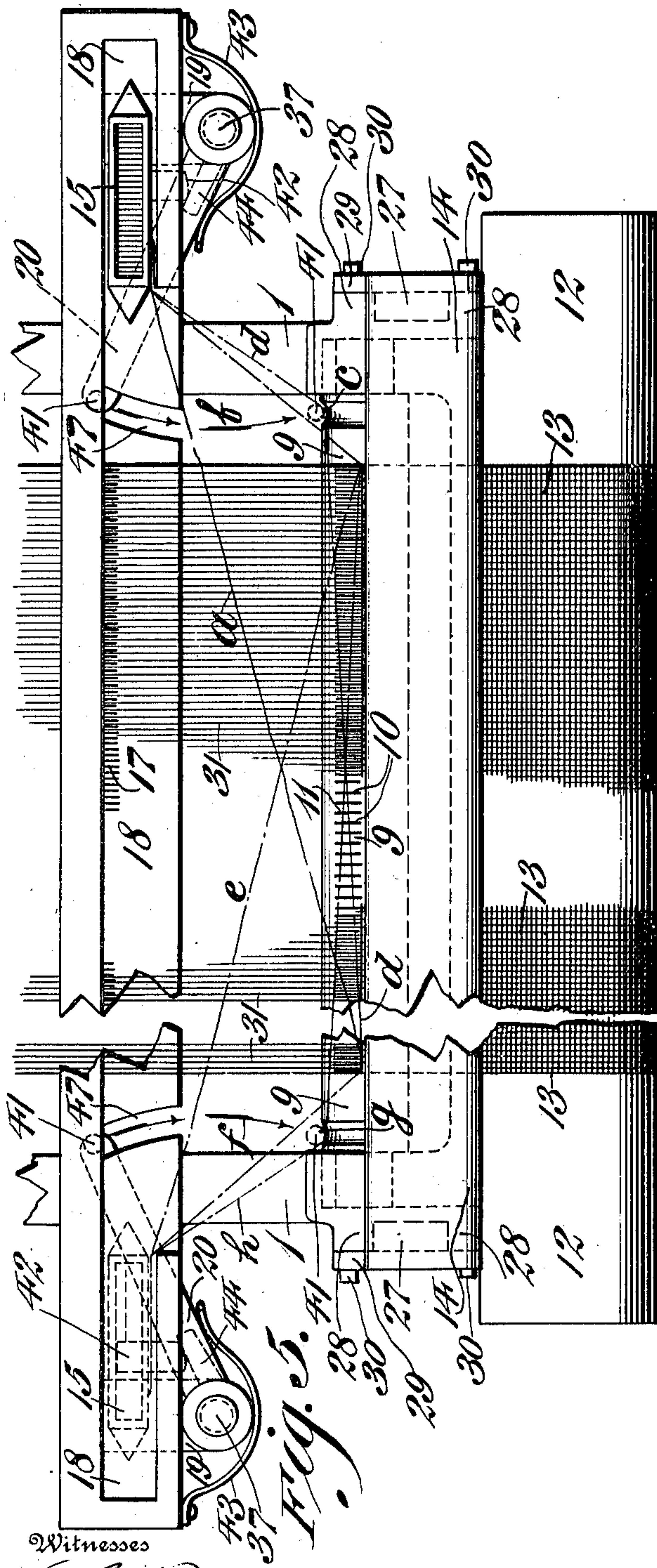
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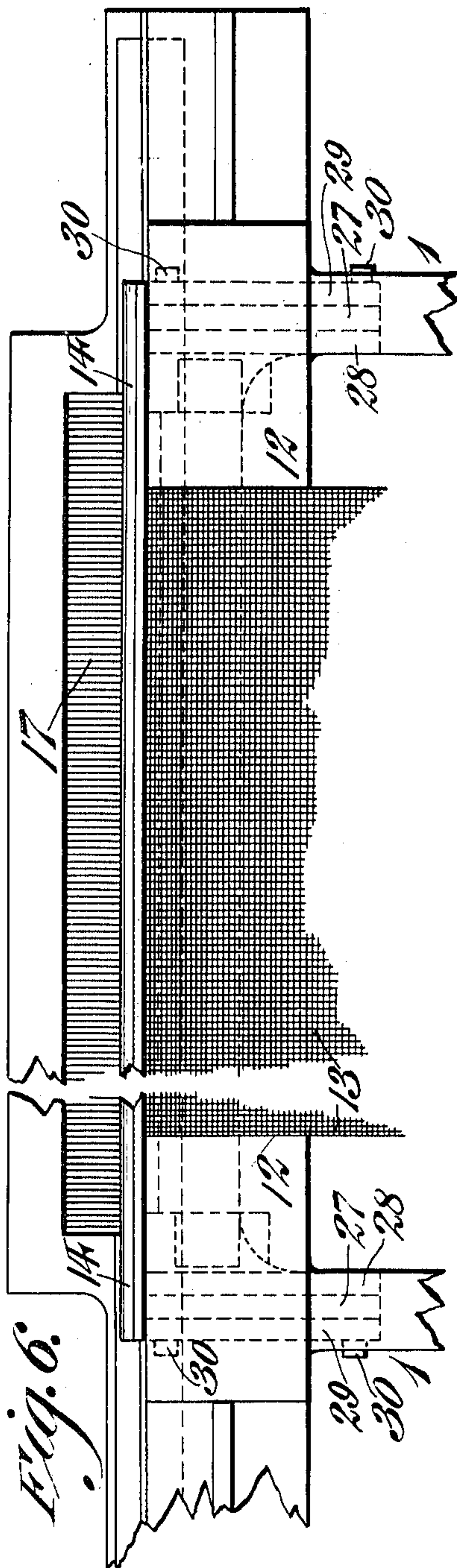
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3 SHEETS-SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## LOOM.

982,862.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, IVAN L. PETERSON, a citizen of the United States, residing at Burlingame, in the county of San Mateo, State of California, have invented a new and useful Loom, of which the following is a specification.

My invention relates to improvements in looms and consists of means whereby the quantity of fabric woven in a given time or the output exceeds that woven in a loom of a similar character but provided with a vibrating frame carrying a reed and a shuttle race of the ordinary type.

My present novel invention is not merely an attempt to increase the speed of the shuttle, nor the speed of the reed or shuttle lay, but broadly relates to novel means for increasing the loom speed by reducing the breaking of the threads; the time necessary for re-tying same, and by an arrangement to permit the shuttle to move on a stationary plane instead of a vibrating plane carrying the shuttle lay and the reed.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 is a side elevation of a portion of a loom having applied thereto certain parts of my invention. Fig. 2 is a perspective view of certain detached portions of the device, on an enlarged scale. Fig. 3 is a vertical section of certain detached portions of the device. Figs. 4 and 5 are plan views of certain of the parts seen in Fig. 3. Fig. 6 is a front elevation of the parts seen in Fig. 5.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the frame of a loom in which is journaled the driving shaft 2 to which motion may be imparted in any well known manner. The shaft 2 has fast thereon a gear wheel 3 that

is in mesh with a gear wheel 4 journaled in the frame 1. The shaft 2 is provided with crank arms 5 to which is coupled one extremity of a link 6 whose opposite end is coupled to a crank arm or its equivalent 7, so as to impart a rocking motion thereto, and consequently to the rock shaft 8 journaled in the frame 1. The shaft 8 has fast thereon a cylinder, or its equivalent 9, provided with teeth 10 forming a comb or open reed 11 which moves in unison with said rock shaft 8. The frame 1 has secured thereto a face-bar or breast-beam 12, over which passes the fabric 13. In order to properly control the lay of the fabric 13 upon the face-bar 12, there is a plate 14 lying on the fabric 13, its width being such as to lie close to the line of the fabric where the last thread from shuttle 15 is placed by the comb or open reed 11 and its action is such that it holds the fabric 13 tightly and closely during all periods except such small portion of time as the comb or open reed 11 is forcing the fabric 13 outward by the thickness of the last weave-thread distance. During the momentary period, the plate 14 is lifted by mechanism hereinafter described. The comb or open reed may be removable from the rock-shaft 8, said comb being secured thereto by suitable fastenings 16 at suitable intervals.

In the regular or ordinary loom, the travel of the vibrating frame at the point of the reed is, perhaps, ten inches in each direction or twenty inches to make one cycle. A loom that is weaving a fabric of say sixty shuttle threads to the inch of length will therefore involve the rubbing effect of the reed bars on each thread of twelve hundred inches or one hundred feet while weaving the one inch of fabric and the mean length of five inches being assumed as the distance each thread is held in the reed during its action, means that each thread is subjected to the vibrating or rubbing effect of six thousand inches or five hundred feet while weaving the five inches of fabric. The finer the texture of the fabric, the greater is the rubbing distance.

The rock-shaft 8 with its comb or open reed 11 may be arranged to afford a travel distance in contact with threads of about one tenth of the distance required by the vibrating reed, and the rubbing distance is therefore but one tenth in its range of the ordinary methods under same conditions of fab-



ric. The saving to be accomplished by this improvement is in the reduction of time required for the tying of threads which are weakened and broken by the rubbing effect  
 5 of the reed bars, and while the machine may not necessarily be driven faster, that is, that the shuttle 15 may be thrown across the weave at any greater number of casts each minute, the saving of weaving time accom-  
 10 plished more than off-sets even some small reduction of shuttle-speed. This is also a point for consideration, as the present high velocity of the shuttle is in its action very severe on shuttle-bobbin-thread or weave-  
 15 thread and much stoppage of loom may be charged to broken weave-thread.

It is evident that, with this improvement, there will be a material saving in labor with the same output, or an increased output of  
 20 material with the same labor from fifteen to twenty-five per cent. as compared with the ordinary loom in use at present.

The reed bars 17 are of usual construction and are supported in the shuttle or race way  
 25 18 which latter is rigidly secured in the frame 1 of the loom. The frame 1 is provided with brackets 19 in which are journaled, as at 37, the arms or levers 20 whose  
 30 free ends are provided with fingers 41 that are adapted to act upon the weft yarn or filling, as hereinafter described. The levers 20 are provided with lugs 44 that coöperate  
 35 with cams 42 fast on the shaft 38 as will be understood from Figs. 3 and 4, for a purpose hereinafter described. The levers 20 are retained normally, in the positions seen  
 40 in Fig. 5 by springs 43. The plate 14 is provided with depending members or guide bars 27 that slide in ways 28 for a purpose hereinafter described, it being noted that said  
 45 bars 27 are retained in position in the frame 1 by plates 29 that are held in position by bolts 30. The lower extremities of the guide bars 27 rest upon cams 34, one of which is  
 50 seen in Figs. 3 and 4, said cams being fast on the shaft 25 that is journaled in bearings 24 that project from the angle bar 23 secured in the frame 1. The shaft 25 has fast there-  
 55 on one end of a lever 35 whose opposite end rests upon a cam 36 that coöperates therewith, it being understood that said cam 36 is fast on the shaft 2. The harness roll 22 is journaled in bearings 21, as will be under-  
 stood from Fig. 3.

45 and 46 designate the cloth and the warp beams, respectively, which may be operated in any well known manner.

The operation is as follows:—The shuttle  
 60 15 after passing through the shed formed by the warp yarn 31 is brought into the position seen in full lines in the right hand portion of Fig. 5. This will cause the weft or  
 65 filling carried by said shuttle 15 to lie in the position indicated at *a* in said Fig. 5. At the instant the shuttle 15 has passed the re-

cess 47, in which rests a finger 41, the cam  
 42 actuates the lever 20 that coöperates therewith and causes said lever 20 and finger  
 41 thereon to move in the direction indi-  
 cated by the arrow *b* in Fig. 5. The finger  
 41 is then brought into the position seen at  
*c* whereupon the weft or filling is brought  
 into the position seen at *d* by said finger 41.  
 The teeth 10 are then moved from their po-  
 sition seen in dotted lines in Fig. 3 into that  
 75 seen in full lines in said Fig. 3 and also in Fig. 5 and thus beats the weft or filling into the fabric 13. The lever 20 and finger 41  
 thereon are then returned to their normal  
 position by the tension of the spring 43,  
 80 while the cam 42 is returning into its normal position seen in Fig. 3. The shuttle 15 is then shot through the shed from its position  
 seen in full lines in the right hand por-  
 tion of Fig. 5 into that seen in dotted lines  
 85 in the left hand portion of said figure. The shuttle 15 in moving from right to left causes the weft or filling carried thereby to lie in the position indicated at *e* after which  
 the lever 20 and finger 41 are moved in the  
 90 direction indicated by the arrow *f* and said finger is brought into the position seen at *g* and causes said filling to lie in the position indicated at *h* by reason of the contact of  
 said finger with the filling or weft yarn.  
 95 The teeth 10 are then brought from their position, indicated in dotted lines in Fig. 3, into that seen in full lines in said figure and beat up the weft or filling into the fabric 13. The cam 42 is then returned to its nor-  
 100 mal position seen in Figs. 3, 4 and 5 whereupon the levers 20 are also returned to their normal positions by the tension of the springs 43. Simultaneously with the beat-  
 105 ing up of the weft or filling into the fabric 13 the cam 34 elevates the bars 27 and consequently the plate 14 secured thereto so as to remove the latter from its contact with the fabric 13 as will be understood from  
 Fig. 3. When the plate 14 is in its elevated  
 110 position the fabric 13 is drawn in the direction indicated by the arrow *m* by the cloth beam 45 to the extent of one weave thread. Motion is imparted to the cam 34 through  
 115 the rock shaft 25 and lever 35 by the rotary motion of the cam 36. When the fabric 13 has been drawn in the direction indicated by the arrow *m*, and to the desired extent, the plate 14 is lowered and bears upon the fab-  
 120 ric 13 so as to retain the latter firmly in position on the angle bar 23, after which the operation hereinbefore described is repeated.

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

1. In a loom, the combination of a sta-  
 130 tionary shuttle-way and a shuttle movable in a horizontal plane, horizontally oscillatory means for laying the weft, and suit-



ably actuated comb mechanism for beating up the weft.

2. In a loom, the combination of a stationary shuttle-way, a shuttle movable in a horizontal plane, a rock shaft carrying horizontally oscillatory means for laying the weft, means for actuating said rock shaft, and comb mechanism for beating up the weft.

3. In a loom, the combination of a stationary shuttle-way, with a plurality of oscillatory pivoted arms for laying of the weft prior to the beating up of the same, a horizontal rock shaft, a comb carried by said horizontal rock shaft, and means for actuating said arm and rock shaft.

4. In a loom, the combination of a stationary shuttle-way with a plurality of oscillatory pivoted arms alternatively operable for preliminarily laying the weft prior to the beating up of the same, a rock shaft operatively connected with said arms and carrying a comb adjacent the breast beam, and means for actuating said arms.

5. In a loom, the combination of a stationary shuttle-way with a plurality of oscillatory swinging arms alternatively operable for preliminarily laying the weft prior to the beating up of the same, a suitably actuated comb mechanism operatively connected with said arms for beating up the weft, and means for operating said comb mechanism.

6. In a loom, the combination of a shuttle-way with a plurality of oscillatory swinging arms alternatively operable for preliminarily laying the weft prior to the beating up of the same, a horizontal rock shaft, and a suitably actuated comb mechanism carried by said horizontal rock shaft and mounted for oscillatory movement for beating up the weft.

7. In a loom, the combination of a shuttle-way, with a reed mounted thereon, a shuttle adapted to move in a horizontal plane, a rock shaft, means for oscillating the same, oscillatory means for preliminarily laying the weft, and an open comb carried by said rock shaft for beating up the weft.

8. In a loom, the combination of a shuttle-way with a reed mounted thereon, a shuttle adapted to move in a horizontal plane, oscillatory means for preliminarily laying the weft, a horizontal rock shaft with cooperating comb mechanism mounted for oscillatory movement for beating up the weft, and means for oscillating the same.

9. In a device of the character described, a shuttle-way, a reed fixedly mounted thereon, a shuttle adapted to operate in said way, a breast beam adjacent said shuttle-way, oscillatory means for laying the weft prior to the beating up of the same, and comb

mechanism mounted for oscillatory movement adjacent said breast beam for beating up the weft.

10. In a device of the character described, a shuttle-way, a reed fixedly mounted thereon, a shuttle adapted to operate in said way, a breast beam adjacent said shuttle-way, oscillatory means for laying the weft prior to the beating up of the same, comb mechanism mounted for oscillatory movement adjacent said breast beam for beating up the weft, and means for fixedly holding a fabric on said breast beam.

11. In a device of the character described, a shuttle-way a reed mounted thereon, a shuttle adapted to operate in said way, a breast beam adjacent said shuttle-way, comb mechanism mounted for oscillatory movement adjacent said breast beam, oscillatory arms for laying the weft prior to the beating up of the same, a bar for fixedly holding a fabric on said breast beam, and automatic means to intermittently release said bar.

12. In a device of the character described, a shuttle-way a reed mounted thereon, a shuttle adapted to operate in said way, a breast beam adjacent said shuttle-way, comb mechanism mounted for oscillatory movement adjacent said breast beam, oscillatory arms for laying the weft prior to the beating up of the same, a bar for fixedly holding a fabric on said breast beam, automatic means to intermittently release said bar, and means for finally beating up the weft.

13. In a device of the character described, a stationary shuttle-way, a reed mounted on said way, a shuttle adapted to operate in said way, horizontally oscillatory means for laying the weft, a breast beam, a horizontal rock shaft mounted for oscillatory movement adjacent said breast beam, a comb carried by said shaft, arms carried by said shaft, and means to operate said arms and said comb to cooperate with the weft to finally beat up the same.

14. In a device of the character stated, a stationary shuttle-way, a reed mounted thereon, a shuttle movable in a horizontal plane, horizontally oscillatory means for preliminarily laying the weft prior to the beating up of the same, a breast beam, a horizontal oscillating rock shaft adjacent said beam, and a comb carried by said rock shaft and interposed between the stationary reed bars and the breast beam for beating up the weft.

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