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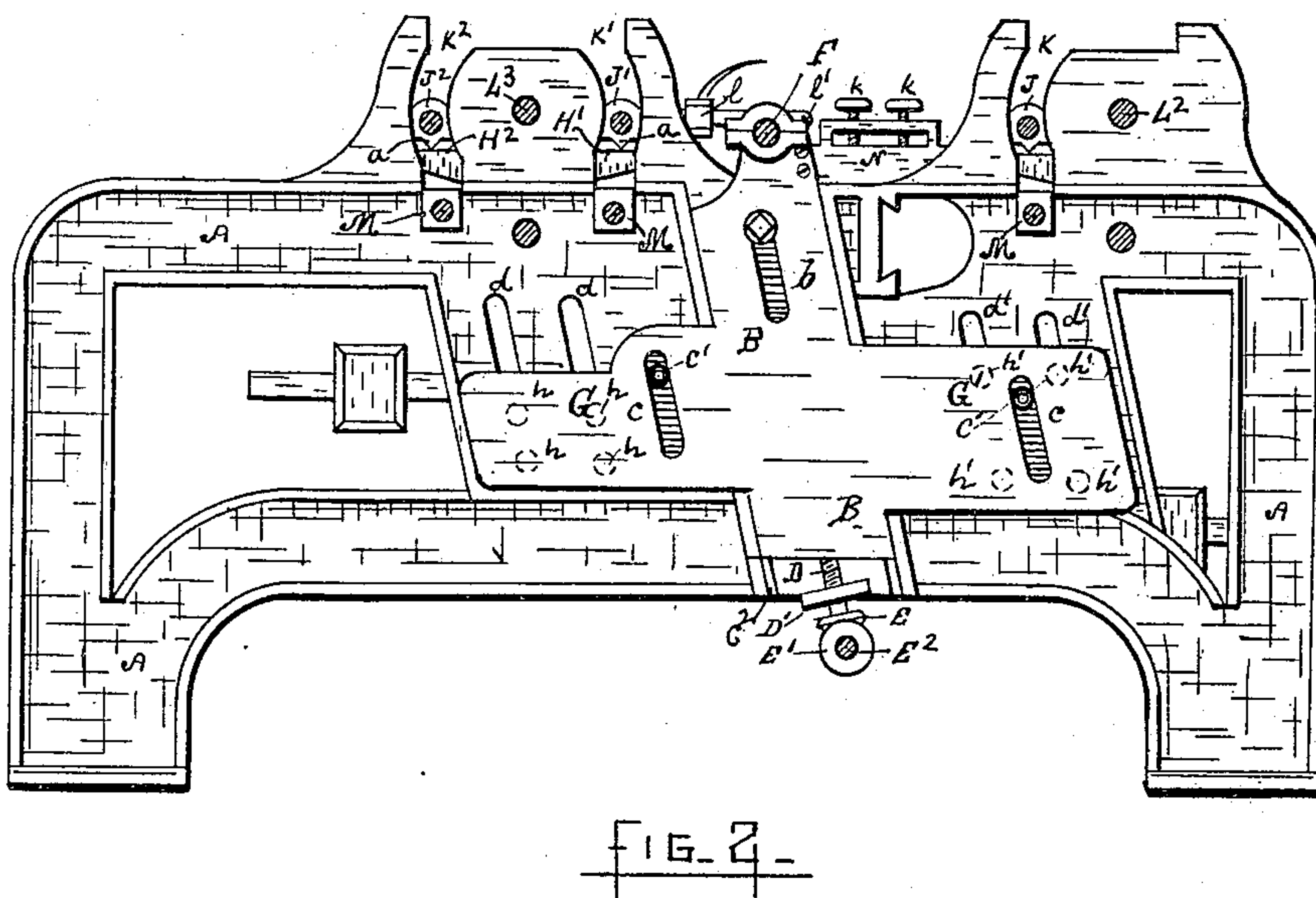
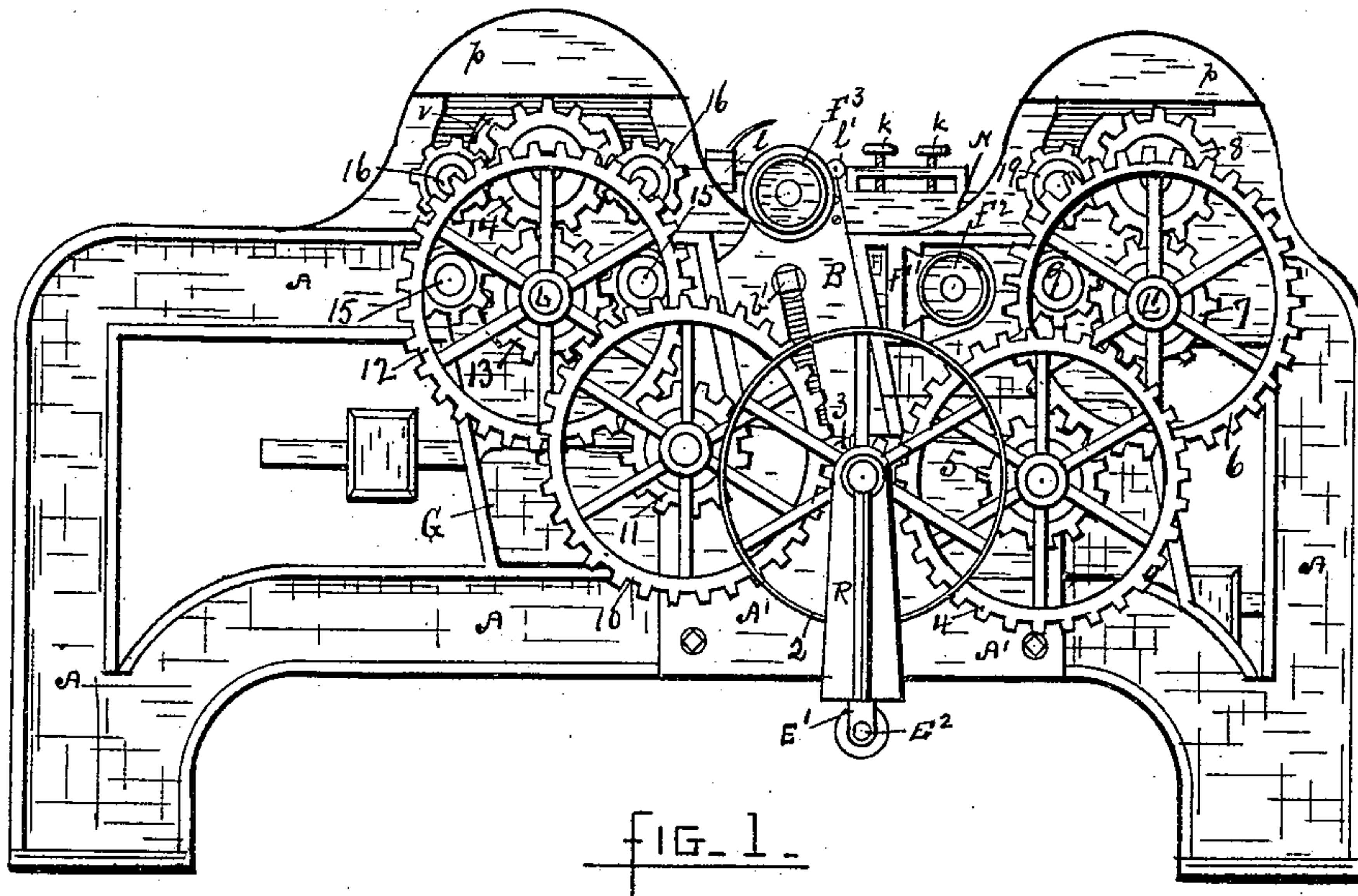
2 Sheets—Sheet 1.

H. A. LEE.

WOOD PLANING MACHINE.

No. 356,482.

Patented Jan. 25, 1887.



Witnesses—

H. M. Fowler
S. McDonnell

Inventor—

Henry A Lee
By Rufus B. Fowler
att'y.

(No Model.)

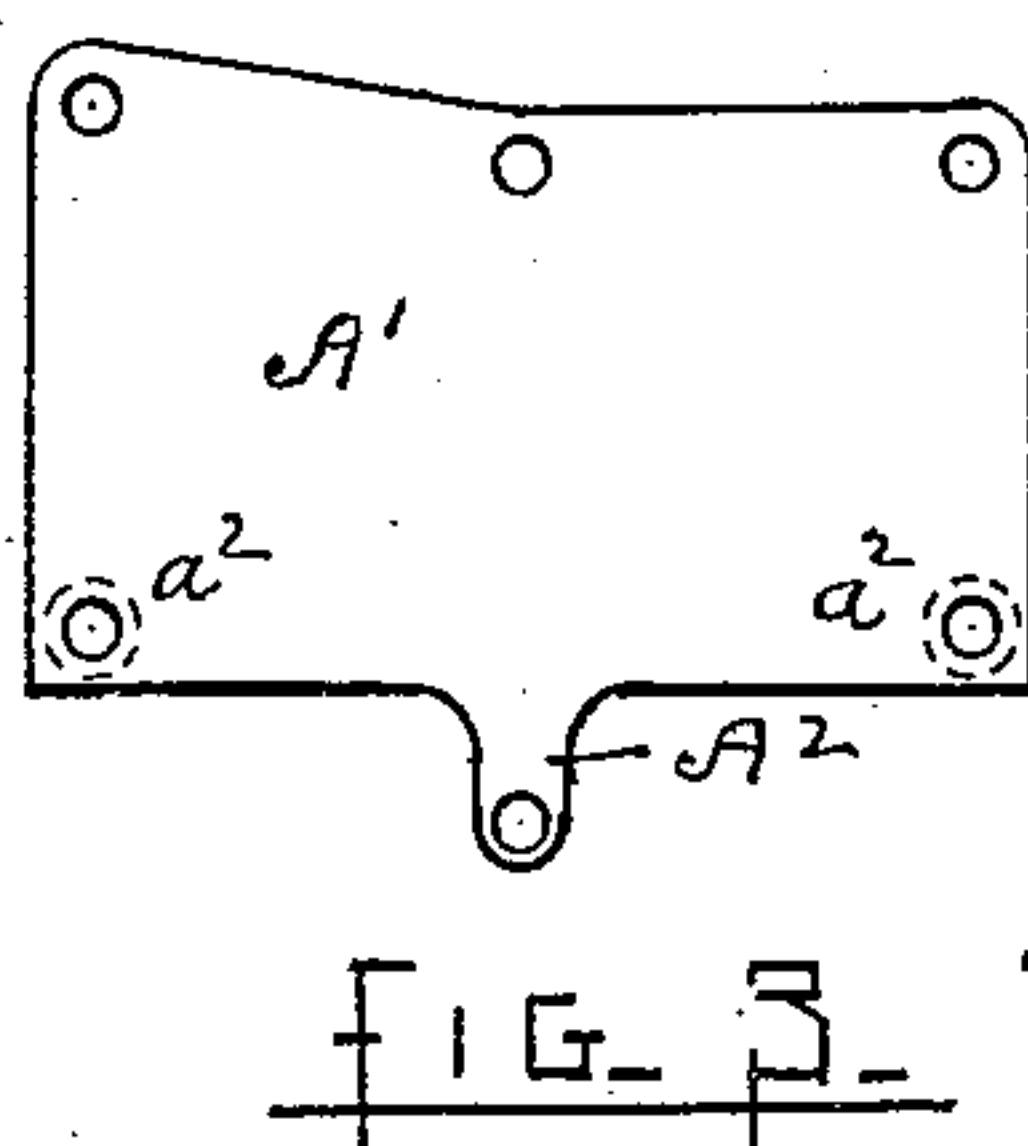
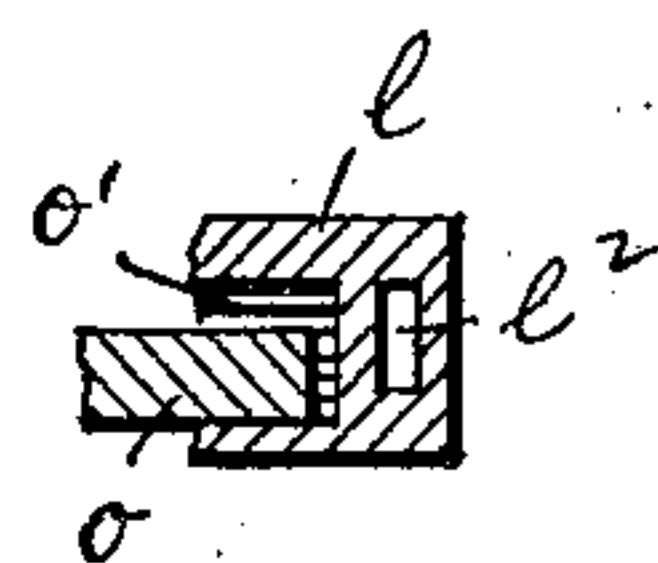
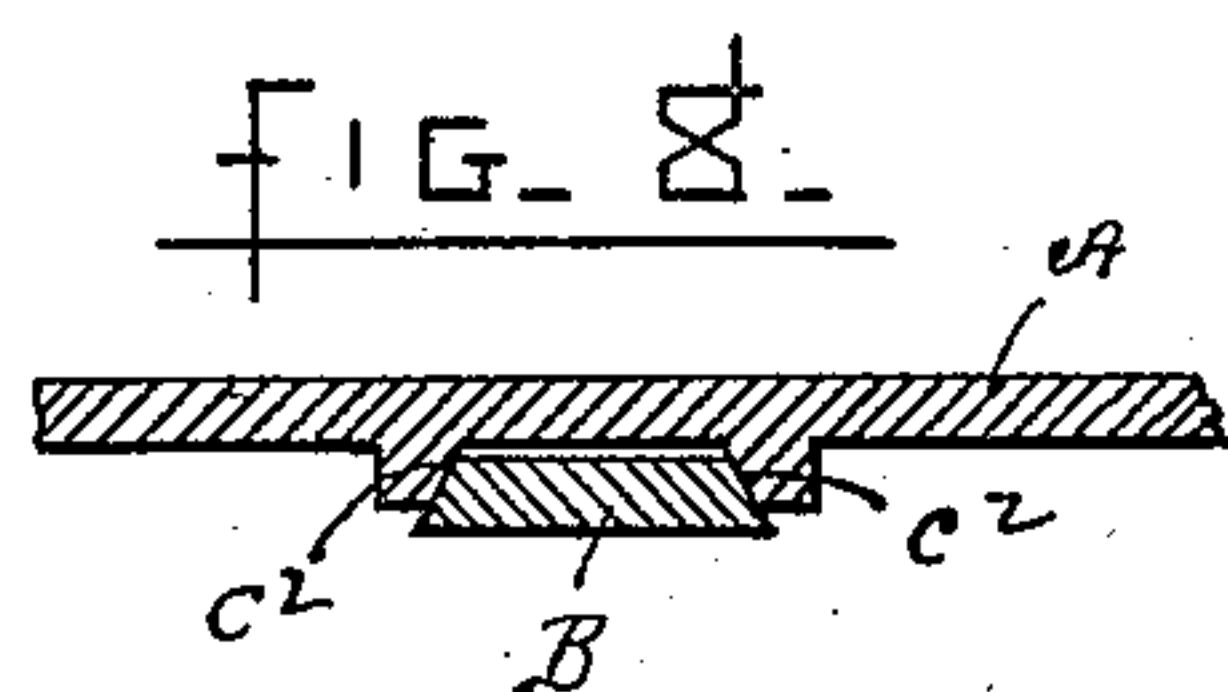
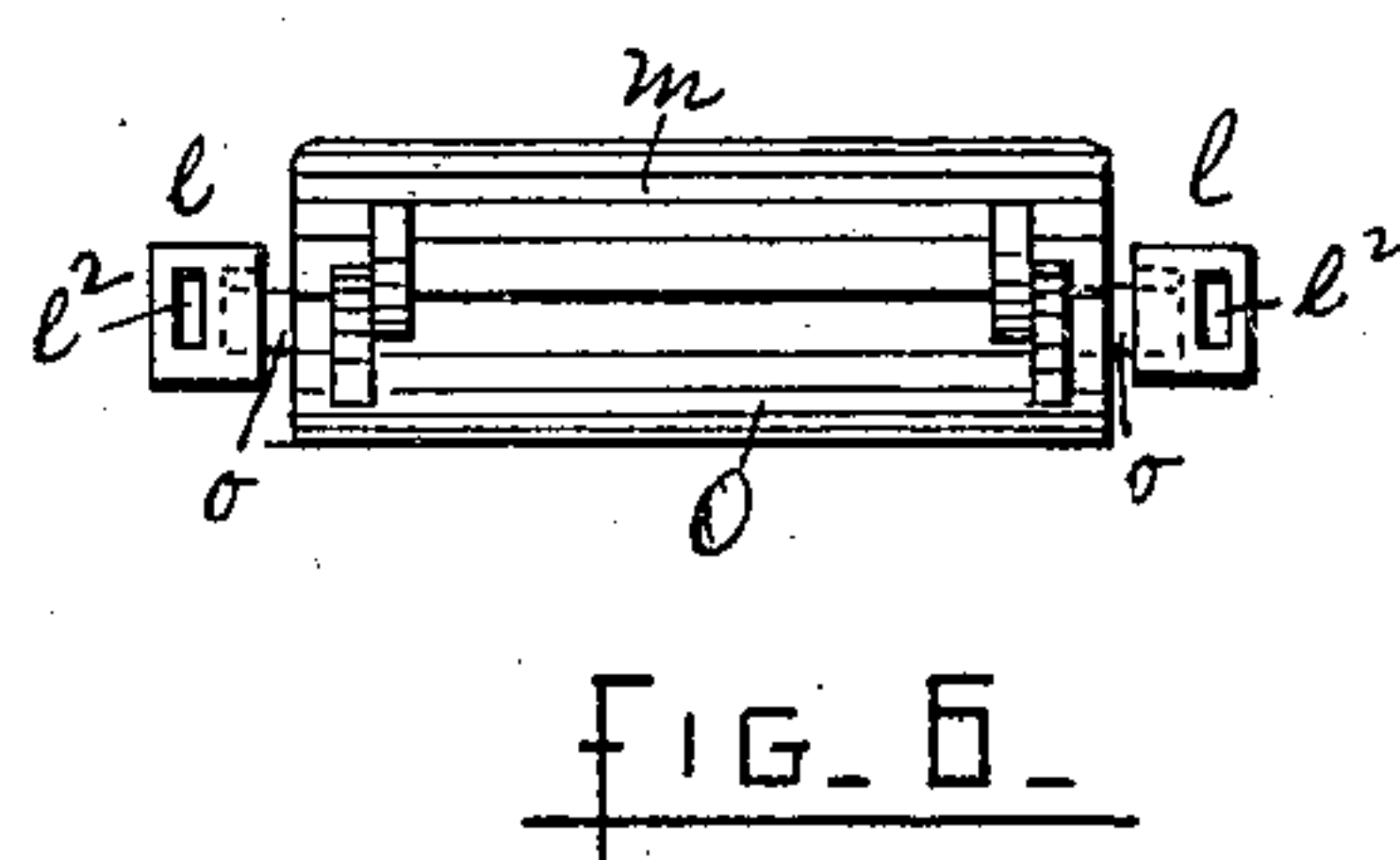
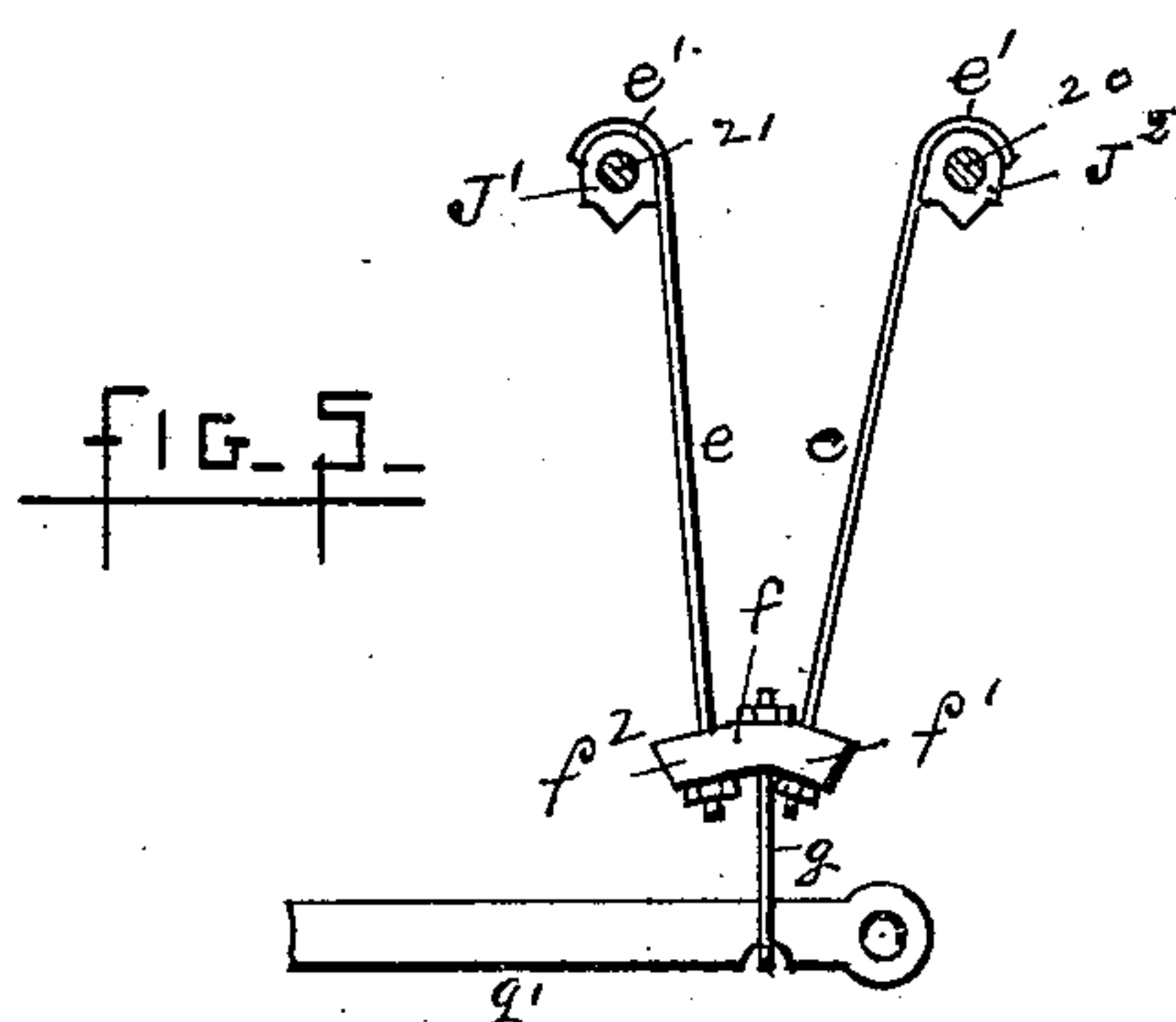
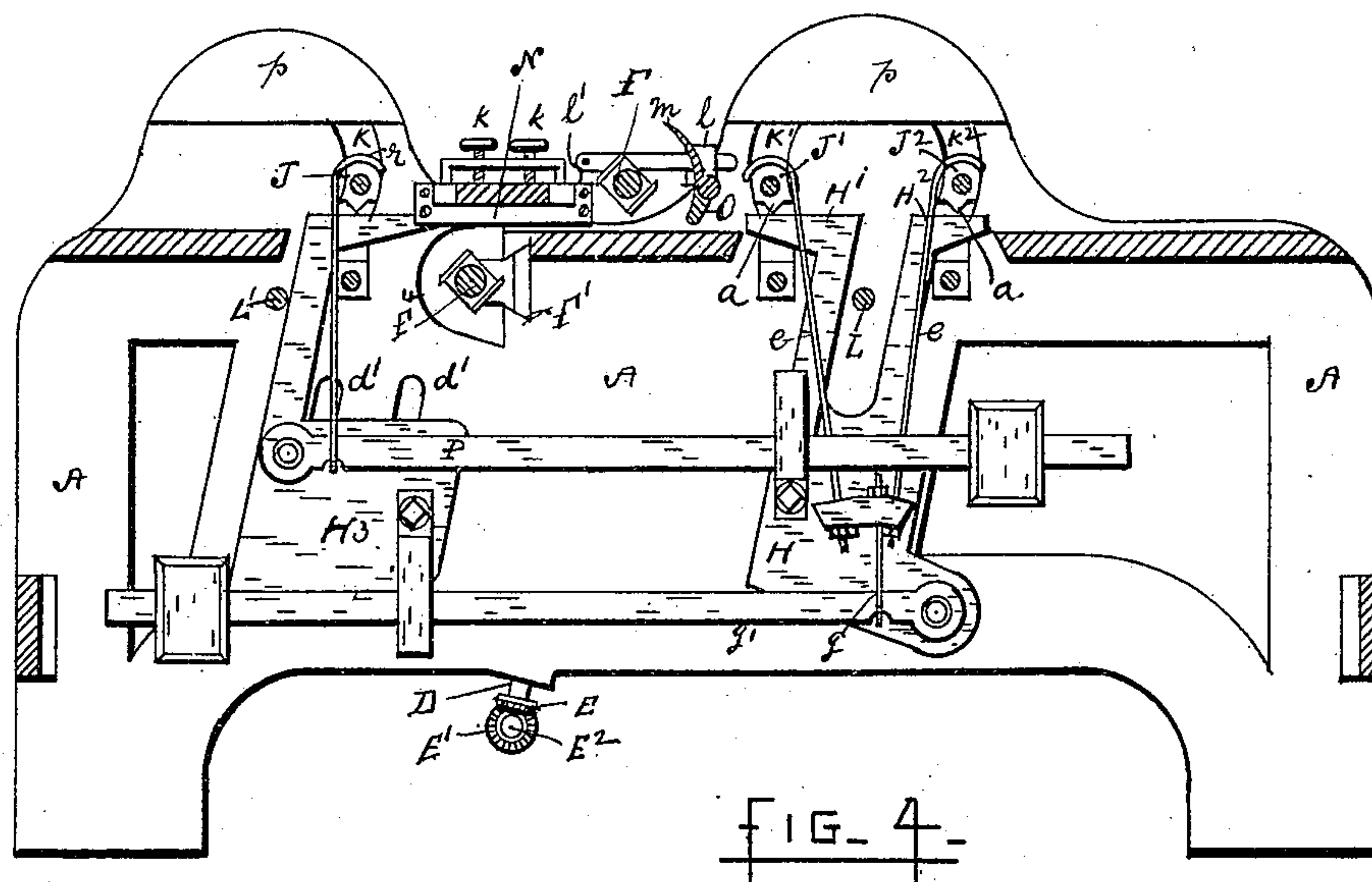
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FIG. 1

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UNITED STATES PATENT OFFICE.

HENRY A. LEE, OF WORCESTER, MASSACHUSETTS.

WOOD-PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 356,482, dated January 25, 1887.

Application filed December 31, 1883. Serial No. 116,111. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. LEE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Wood-Planing Machines, of which the following is a specification, containing a full, clear, and exact description of the same, illustrated by the accompanying drawings, in which—

Figure 1 represents a side elevation of a planing-machine embodying my invention. Fig. 2 is the same, with portions of the mechanism for operating the feed-rolls removed. Fig. 3 shows a detached view of the plate carrying parts of the feeding mechanism. Fig. 4 is a longitudinal sectional view showing the inner side of the side of the machine shown in Figs. 1 and 2, and illustrating the lifting-plates by which the feed-rolls are raised. Fig. 5 shows the method of weighting the front feed-rolls. Fig. 6 is a front view of the "flexible" presser-bar. Fig. 7 is an enlarged and sectional view of a portion of the same, and Fig. 8 is a sectional view of the sliding plate B in the way c^2 on line S S, Fig. 2.

Similar letters refer to similar parts in the several views.

My invention consists in means for raising the upper cutter-head, the several feed-rolls, and the presser-bars simultaneously; in the construction and arrangement of devices for adjusting the "expanding" feed-rolls; in the arrangement of the feed-actuating mechanism; in the construction of the flexible presser-bar, and in the method of weighting the feed-rolls.

A indicates the frame of the machine; B, the sliding plate, forming a stand for the upper cutter-head and vertically adjustable in the ways C^2 by means of the screw D held in the bearing D' , and rotated by the bevel-gear E and the bevel-gear E' on the horizontal shaft E^2 , to which a crank or hand wheel may be applied.

F, Fig. 2, is the shaft of the upper cutter-head, shown in section, the belt pulley F^3 having been removed.

F' are ways extending transversely across the machine, and in which the lower cutter-head, F^4 , driven by the belt-pulley F^2 , may be drawn out at the side of the machine, a con-

struction which was made the subject-matter of the Letters Patent No. 120,589, granted to me November 7, 1871.

Extending laterally from each side of the sliding plate B are the wings $G G'$, having slots $C C'$, allowing the wings to slide past the bosses $C' C'$ on the frame A. Upon the under side of the wing G are the bosses (shown by the broken lines) $h h h$, Fig. 2, extending through the slots $d d$ in the frame, and to which the plate H is attached, so the plate H will have a vertical movement on the inside of the frame conjointly with that of the sliding plate B and wing G on the outside of the frame. The plate H, bifurcated to inclose the shaft L, extends upward, with its upper edges, H' and H^2 , projecting laterally to the right and left, respectively, and passing beneath the bearings J' and J^2 of the upper feed-rolls, which lie in the curved slots K' and K^2 in the frame A.

The projecting spurs $a a$, Figs. 2 and 5, I extend transversely across the box, resting them on the edges H' and H^2 , in order to reduce the point of contact and more readily admit of the slight rotation of the bearings $J' J^2$ consequent upon their moving in the curved slots $K' K^2$. By a similar construction the wing G' has the bosses $h' h' h'$ extending through the slots $d' d'$ in the frame A, and attached thereto is the plate H^3 on the inner side of the frame and extending upward, with its upper edge projecting laterally to the left and beneath the upper feed-roll bearing, J, lying in the curved slot K. To the upper ends of the sliding plate B and the inner plate, H^3 , I attach a bar, N, which carries a rigid presser bar or plate held down upon the upper surface of the work by the screws $k k$.

Pivoted to a lug, l' , is a short lever extending over the bearing of the upper cutter-head and carrying the block l and an adjustable presser-bar, O. (Shown in Fig. 6.)

The above-described arrangement of plate B, wings $G G'$, inner lifting-plates, $H H^3$, bar N, pivoted lever and block l , actuating-screw D, and beveled gears $E E'$ are duplicated, substantially, on the opposite side of the machine, the shaft E^2 of the gear E' extending across beneath the frame A, and connecting the corresponding bevel-gear upon the other side of the machine, so that the rotation of the shaft E^2

will cause a simultaneous motion of the sliding plates upon both sides, with all their connected parts.

The method of uniting the adjusting devices, as described, has long been in use, and is therefore not shown in the drawings.

It will be seen that the vertical adjustment of the sliding plate B with the upper cutter-head will also secure a simultaneous and corresponding adjustment of all the upper feed-rolls and presser-bars, so that the necessary adjustment of the entire machine may be effected by the single action of turning the shaft E².

To the frame A, and outside the sliding plate B and wings G G', I attach, by suitable screws or bolts, the plate A', Figs. 1 and 3, its upper edge resting on the bosses C' C', attached to the frame A and its lower edge supported by the bosses a² a². (Shown by broken lines in Fig. 3.) The arm or bracket R, attached to the plate A', supports the shaft-bearing, the belt-pulley 2, and the pinion 3, which meshes into the gears 4 and 10, turning on studs attached to the plate A'. To the hubs of the gears 4 and 10 are attached the pinions 5 and 11, which mesh into the gears 6 and 12 upon the rotating shafts L' and L, extending through the machine and journaled in proper bearings in the frame A. Upon the hubs of the gears 6 and 12 are the pinions 7 and 13, which mesh into similar pinions, 8 and 14, turning on studs L² and L³ in the frame A.

The pinions 7 and 13 drive the pinions 9 and 15 on the ends of the lower feed-rolls, whose bearings M are held in slots in the frame A, and may be provided with screws or such other devices as are in common use for the purpose of securing the proper adjustment of the lower feed-rolls with reference to the bed of the machine. The pinions 8 and 14 drive the pinions 19 and 16 on the upper feed-rolls, whose bearings slide in the slots K, K', and K², curved concentrically to the driving pinions 8 and 14, so that the pinions 19 and 16 will remain in gear at varying vertical heights. The slots K, K', and K² are straight at their bottom ends and open at the top, permitting the upper feed-rolls to be readily removed. The cap-pieces p p serve to protect the roll-bearings and gears from chips or dirt.

The upper feed-roll, 19, I weight by means of the hook r, hooked at its upper end over the top of the bearing J, and at its lower end, beneath the weighted lever P, pivoted to the inner lifting-plate H³. The front upper feed-rolls are weighted by the device shown in Figs. 4 and 5, in which J' J² are the feed-roll bearings, and around which I pass the hooks e' e', having rods e e, extending downward and passing through holes somewhat larger than the rods in the yoke f. Through the yoke f, I pass the rod g, which hooks beneath the weighted lever g', pivoted to the inner lifting-plate H. Nuts on the ends of the rods e and g attach them to the yoke f, and also allow an adjustment of their length.

As the driving-gear 14 has a motion in the

direction of the arrow V, Fig. 1, giving a tendency to the feed-roll on the left to move upward and away from the bed-plate of the machine. I counteract this tendency by making the arms of the yoke f, as determined by the attachment of the rods e e, of unequal length, the arm f' being shorter than the arm f², thereby bringing the greater weight on the roll 20. The adjustable presser-bar O, Fig. 6, I form of the usual shape, and to the top is hinged the curved guard-plate m. The ends of the presser-bar have tenons o o, entering mortises o' o' in the blocks l, which are held on the levers pivoted at l' and passing through the mortises l². The mortises o' o' are made slightly wider than the tenons o o, as shown in Fig. 7, for the purpose of allowing the presser-bar to assume a position at a slight angle with the bed-plate when boards with sides of unequal thickness are passed beneath it. The sliding plate B moves in ways or guides on the sides of the machine, (shown in section in Fig. 8,) the ways having beveled sides c² c², a small space being left between the plate B and the side of the frame A. The plate B is held in the ways C² C² by a screw-bolt, b', passing through the slot b and entering the frame. This method of fastening the sliding plate by means of a screw-bolt has been long in use; but by the use of the beveled ways with such mode of fastening I am able to hold the plate B more firmly, taking up any wear that may occur and preventing any vibration of the cutter-head, which is one of the most common sources of imperfect work. By loosening the binding-screw bolt b' the plate B is at once permitted to move freely by the actuating-screw D:

I do not confine myself to any special form of the wings G G' or of the inner lifting-plates, H H³; nor do I claim, broadly, the raising of the upper feed-rolls simultaneously with the cutter-head, as such has been before accomplished; but by my present arrangement of the mechanism for lifting the cutter-head and feed-rolls I carry out the lateral wings from the lower end of the plate sliding upon the side of the machine, where it is actuated by the operating-screw, instead of from the upper end, as has usually been done, and I connect the lateral wings with the bearing of the feed-rolls by lifting-plates carried up on the inside of the machine, where they do not interfere with the driving mechanism. By this means I remove all lateral strains from the plate sliding in ways on the side of the machine, rendering it much easier to be operated by the actuating-screw.

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

1. The combination, with the upper cutter-head and the upper feed-rolls of a wood-working machine, of the mechanism for simultaneously raising the same when such mechanism consists of a plate sliding in ways on the side of the machine and carrying the bearing of the upper cutter-head, said plate having

wings extending laterally therefrom, with projections passing through the side of the machine, and lifting-plates attached thereto and extending upward on the inside of the machine, upon whose upper edges the bearings of the upper feed rolls rest, as and for the purpose set forth.

2. The combination, with the upper cutter head and presser plate or bar over the lower cutter-head, of mechanism for simultaneously raising the same when such mechanism consists of a plate sliding in ways on the outside of the machine and carrying the bearings of the upper cutter-head, said plate having a wing extending laterally therefrom with projections passing through the side of the machine, a lifting-plate attached thereto and extending upward on the inside of the machine, and a horizontal bar connecting the upper ends of the outer sliding plate and the inner lifting-plate, said bar supporting the upper presser-plate, as described, and for the purpose set forth.

3. The combination, with the frame of a wood-planing machine, of the plate A', attached to the side of the machine and parallel thereto, said parallel plate carrying a portion of the driving mechanism, substantially as described, and for the purpose set forth.

4. The belt-pulley 2 and pinion 3 on a shaft journaled in bearings at the side of the machine, intermediate gears, 4 and 10, driven by the pinion 3 and carrying pinions 5 and 11, engaging gears 6 and 12, gears 6 and 12, carrying pinions 7 and 13, which engage pinions on the shafts of the lower feed-rolls, and the pinions 8 and 14, turning on studs attached to the frame driven by the pinions 7 and 13, and engaging pinions on the shafts of the upper feed-rolls, all combined and operating as described, and for the purpose set forth.

5. The combination, with the cutter-head of a wood-working machine and a plate supporting said cutter-head and sliding in ways on the side of the machine, whereby the vertical adjustment of the cutter-head is effected, of ways adapted to receive the sliding plate, said ways having their sides $c^2 c^2$, forming the bearing-surface for said sliding plate, made oblique to the side of the machine, with devices for binding said sliding plate firmly against the oblique sides of the ways, as and for the purpose set forth.

6. The combination, with the upper feed-rolls of a wood-working machine carrying actuating-gears, of a driving gear rotating on a stud attached to the frame of the machine and engaging the gears upon the upper feed-rolls, slots in said frame curved concentrically to the driving-gear and holding the bearings of the upper feed-rolls, lifting plates or bars, substantially as described, extending beneath said bearings and having actuating means connected therewith, whereby the bearing of said upper feed-rolls may be raised and main-

tained at varying heights in said curved slots relatively to the said driving-gear, as and for the purpose set forth.

7. The combination, with the frame of a wood-working machine and driving-gears turning on studs or shafts held therein and a pair of feed-rolls forming an "upper" and "under" feed-roll and having actuating-gears, of slots in said frame to receive the bearings of said upper and under feed-rolls and hold them in proper position, so the driving-gears in the frame may engage the gears on the rolls, said slots having their lower section straight and their upper section curved concentrically with the upper driving-gear, the straight and curved sections forming one continuous slot, so both the upper and under roll-bearings may be entered at the top of the slot, as described, and for the purpose set forth.

8. The combination, with a pair of feed-rolls driven by a gear-wheel engaging pinions on the two feed-rolls, whereby one of said feed-rolls is given a tendency to be raised away from the bed-plate, of a weighting device consisting of a weight applied to a yoke, f, said yoke being connected with said feed-rolls at points unequally distant from the application of the weight to said yoke, so a greater pressure will be applied to one of said feed-rolls, substantially as described, and for the purpose set forth.

9. The combination, with the presser bar O, having tenons $o o$, of the mortised blocks l, pivoted by levers to the machine at l', said blocks having the mortises $o' o'$, slightly larger than the tenons $o o$, as and for the purposes set forth.

10. The combination, with the feed-roll bearings having a vertical motion in curved slots and a lifting bar or plate upon which said bearings rest, of the spurs a, projecting from the under side of said bearings and resting on the lifting bar or plate, said spurs forming fulcrums to allow a free rocking motion of the bearings as they are carried upward in the curved slots, as and for the purpose set forth.

11. The combination, with the upper cutter-head and the upper feed-rolls of a wood-working machine, of mechanism for simultaneously raising the same when such mechanism consists of a plate sliding in ways on the side of the machine and carrying the bearing of the upper cutter-head, said plate having wings extending laterally from its lower section and said wings carrying lifting-plates extending upward from the ways, and upon whose upper edges the bearings of the upper feed-rolls rest, as and for the purpose set forth.

HENRY A. LEE.

Witnesses:

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GEO. E. SMITH.