(No Model.)

5 Sheets—Sheet 1.

S. A. WOODS & J. R. THOMAS.

PLANING MACHINE.

No. 438,746. Patented Oct. 21, 1890.

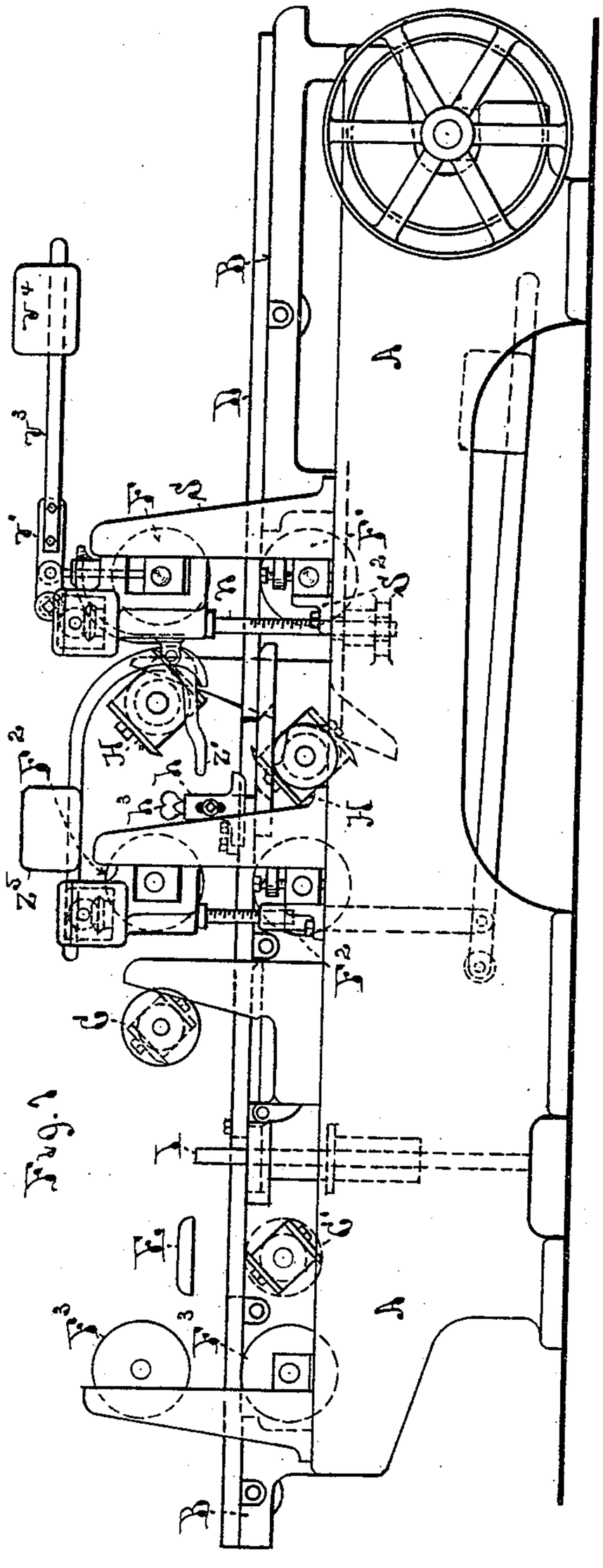

Fig. 1.

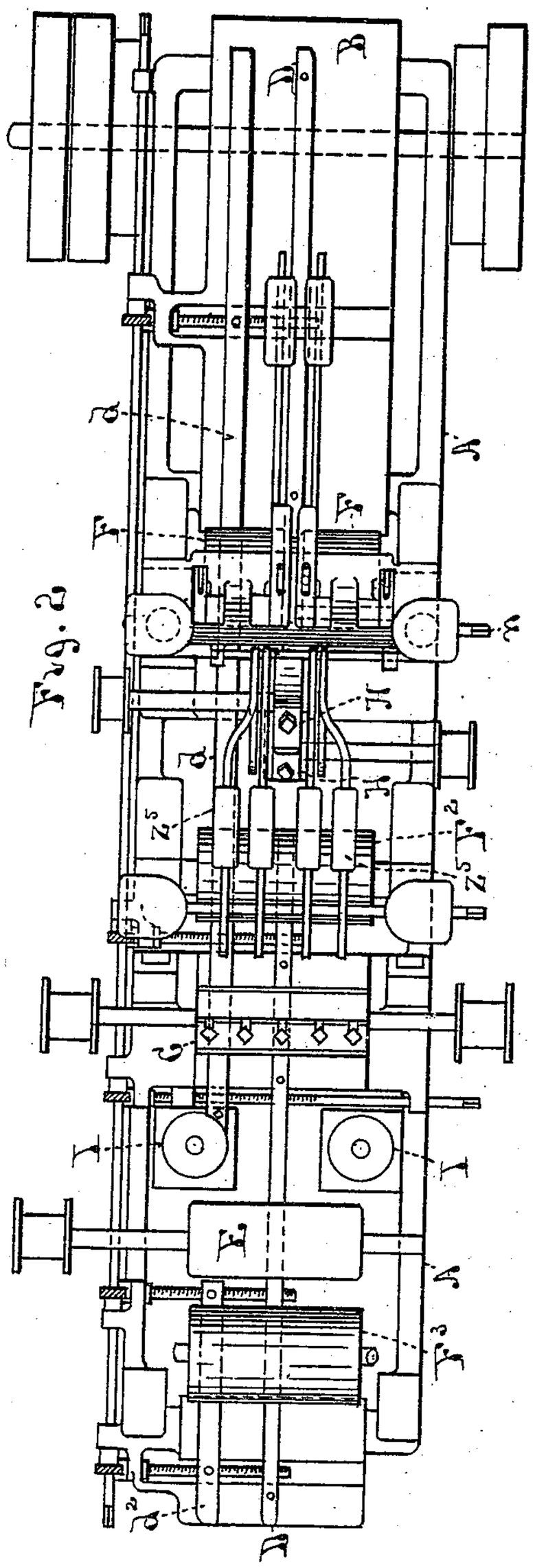

Fig. 2.

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(No Model.) 5 Sheets—Sheet 2.

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PLANING MACHINE.

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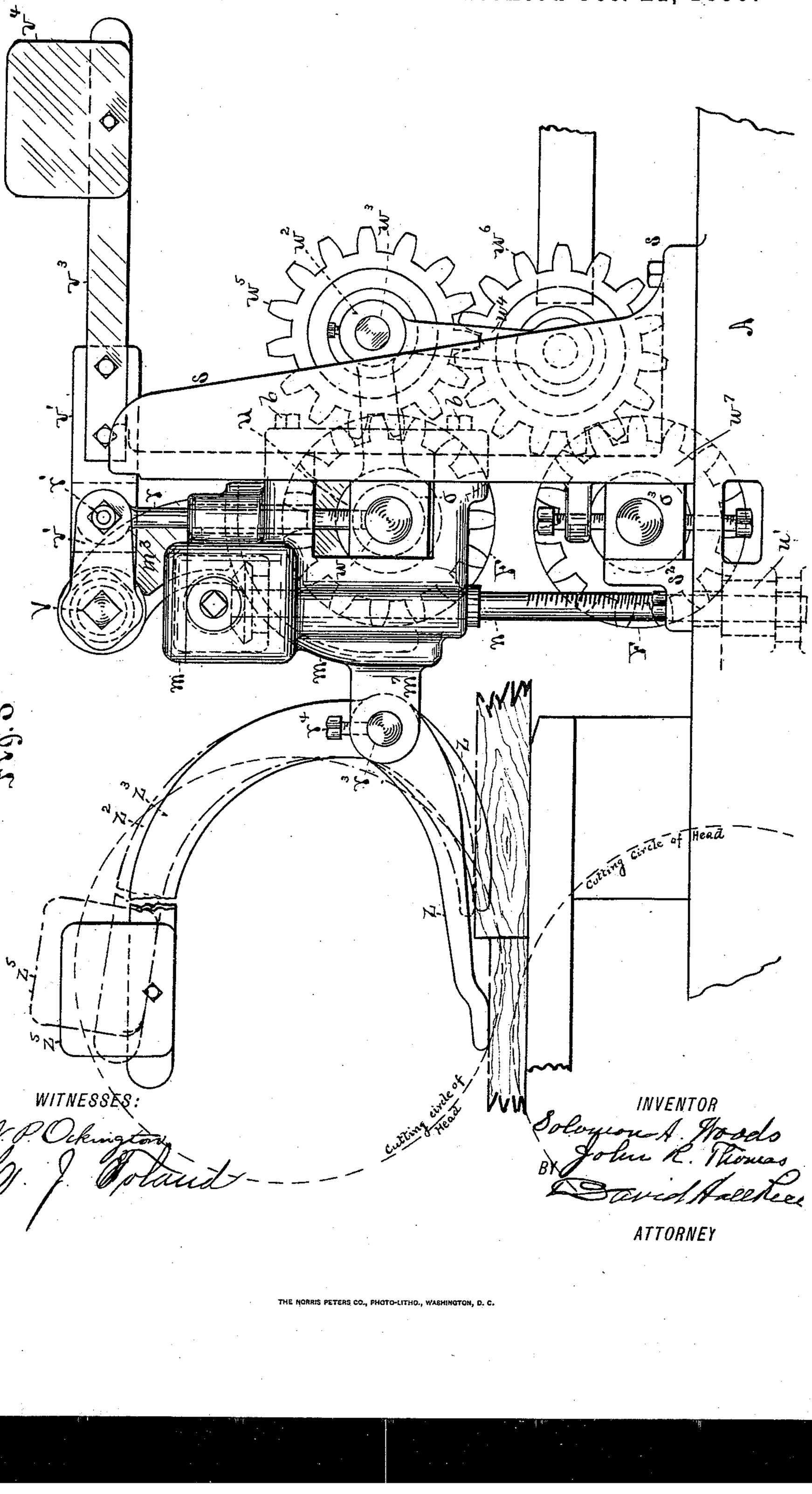

Fig. 3.

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(No Model.) 5 Sheets—Sheet 3.

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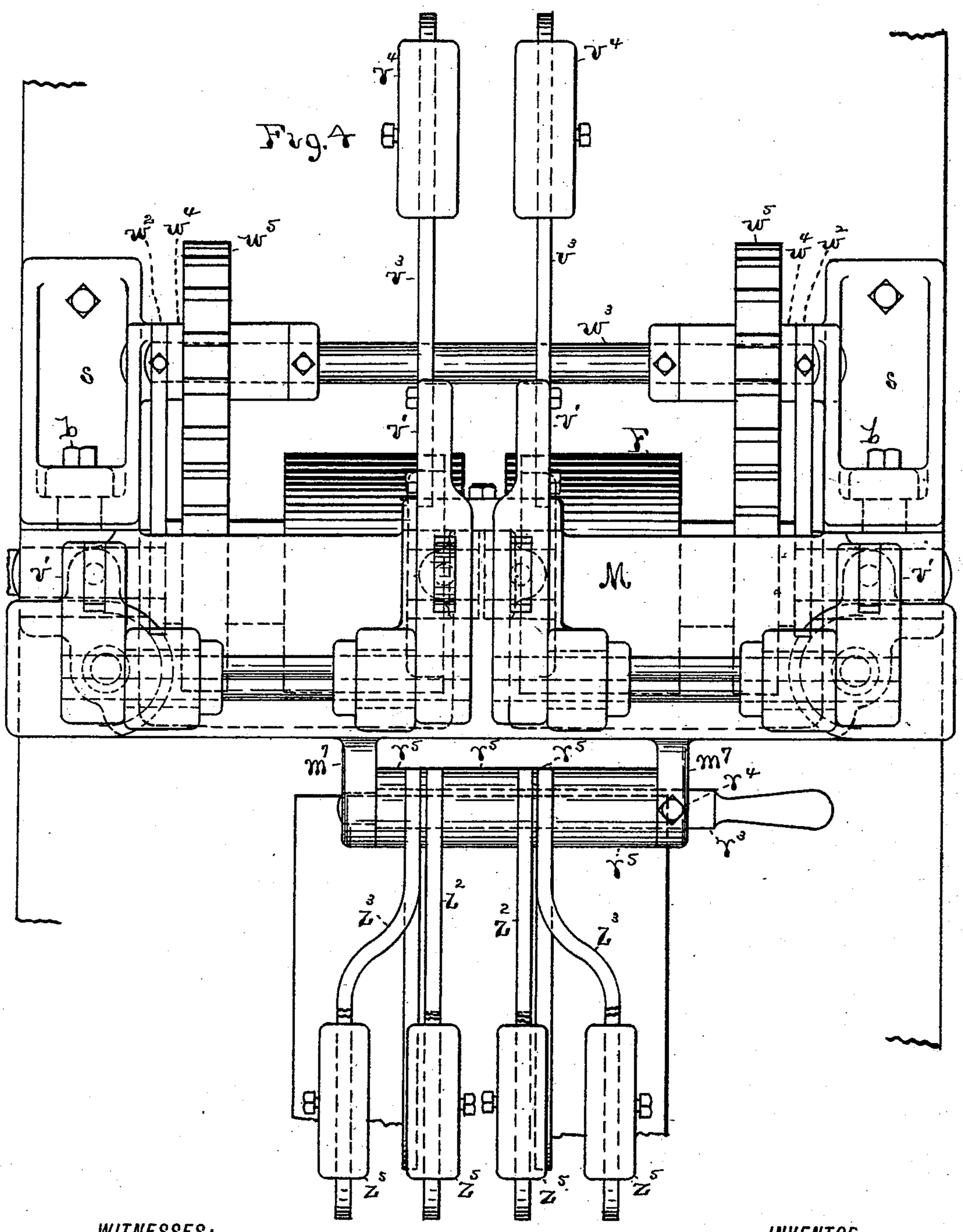
PLANING MACHINE.

No. 438,746. Patented Oct. 21, 1890.

Fig. 4



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5 Sheets—Sheet 4.

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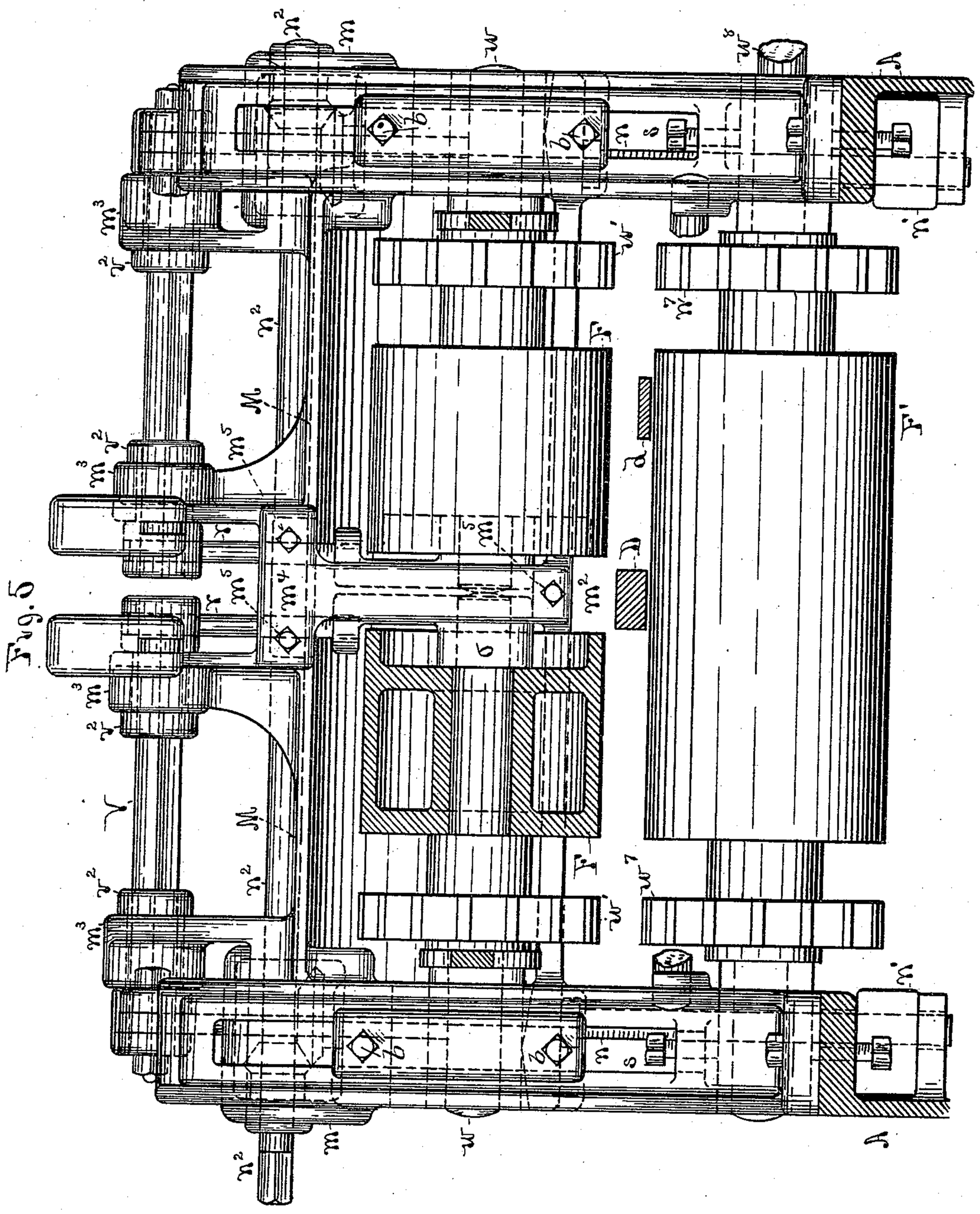
PLANING MACHINE.

No. 438,746. Patented Oct. 21, 1890.



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PLANING MACHINE.

No. 438,746. Patented Oct. 21, 1890.

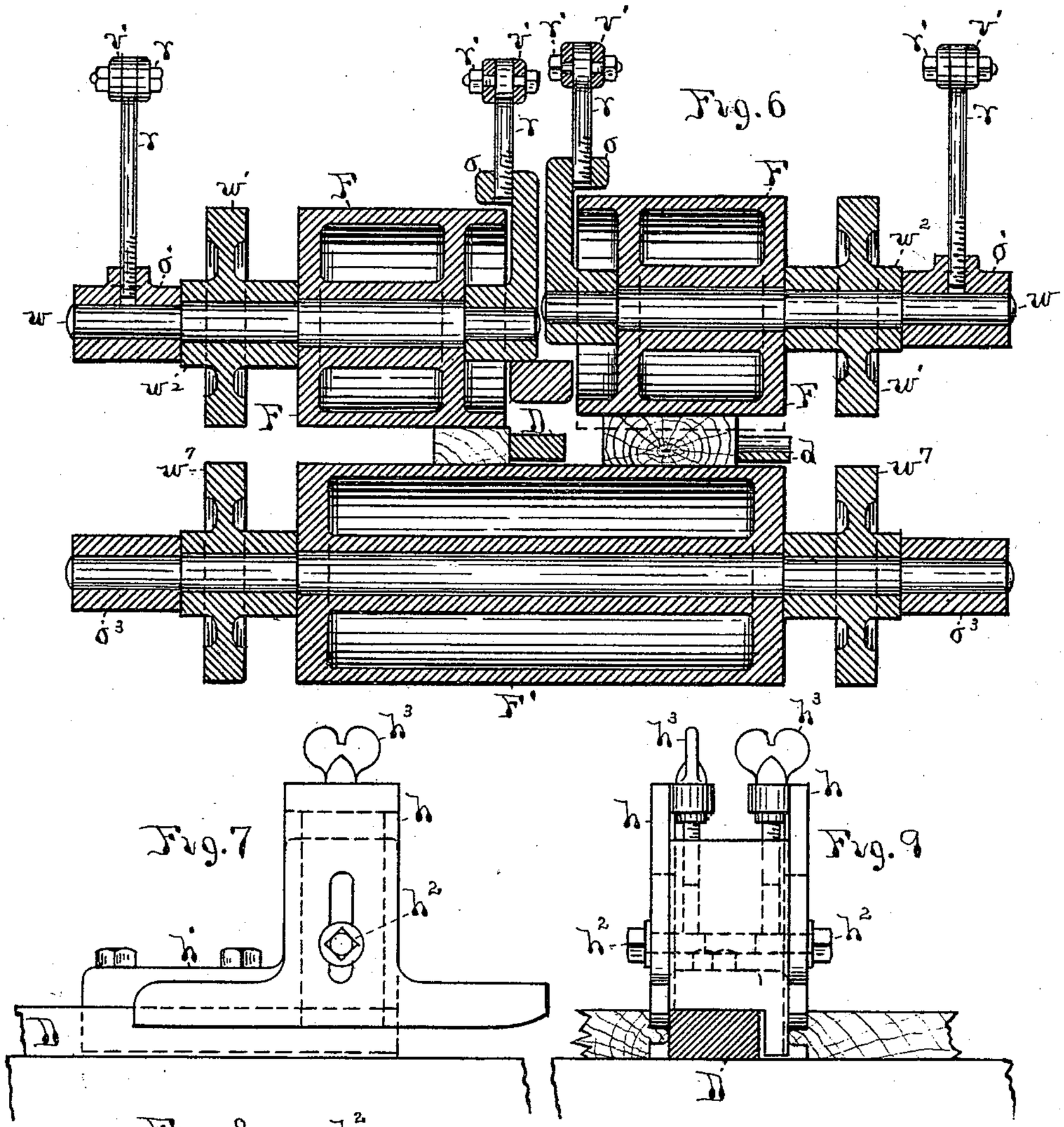

Fig. 6

Fig. 7

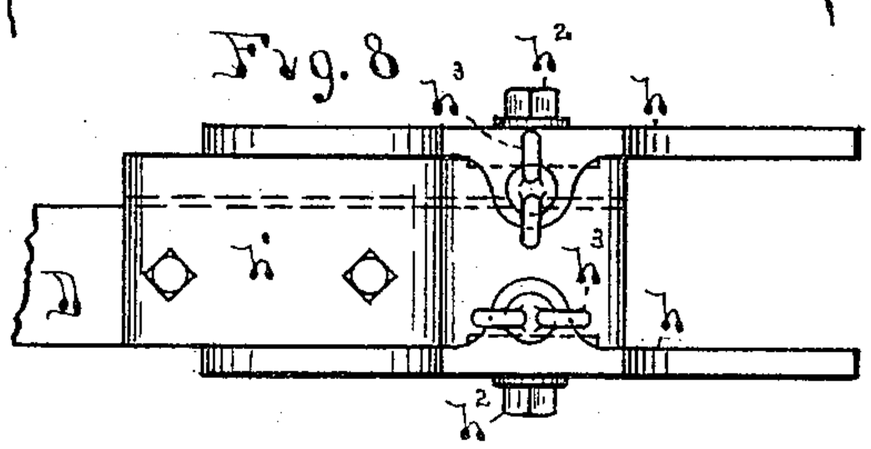

Fig. 8

Fig. 9

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UNITED STATES PATENT OFFICE.

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PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 438,746, dated October 21, 1890.

Application filed September 19, 1888. Serial No. 285,828. (No model.)

To all whom it may concern:

Be it known that we, SOLOMON A. WOODS and JOHN R. THOMAS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improvement in Planing-Machines, of which the following is a specification.

Our invention relates to planing-machines; and it consists in certain improved constructions and combinations of several parts and attachments of the machine patented to us July 10, 1888, in Letters Patent No. 385,895, substantially as hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a planing-machine constructed according to our invention, having some of the parts removed for the sake of clearness in illustrating the remainder. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevation of the portion of the machine containing the feed-rolls and hold-downs on the feed-in side of the machine. Fig. 4 is a top plan view of the same. Fig. 5 is an elevation of the same looking from the feed-in end of the machine. Fig. 6 is a longitudinal section through the feed-rolls belonging thereto and their gears and boxes, showing some of the attached parts. Figs. 7, 8, and 9 are respectively detail views of a side elevation, top plan, and end elevation of guides attached to the machine to hold the lumber down with their supporting-stand and adjusting mechanism.

A is the frame-work of the machine.

B is the bed.

C is the top planing-cylinder, which extends across the whole breadth of the machine.

C′ is the lower planing-cylinder of like construction.

D is the longitudinal central guide-strip, which is attached to the upper surface of the bed and serves as a guide to one of the boards passing through the machine.

E is the top platen to hold the board against the lower planing-cylinder.

F F are the first top feed-in rolls, and F′ the first bottom one.

F^2 F^2 are the second pair of feed-in rolls.

F^3 F^3 are the feed-out rolls.

All the usual or ordinary parts of the machine not shown may be constructed and mounted in accordance with our said former patent, as well as the upper and lower tonguing cutter-cylinders H H and the side grooving-cylinders I I. The side guide d d^2 is also constructed and mounted as shown in our said former patent.

One of the objects of our present invention is to provide for the proper adjustment and operation of the divided feed-in roller F F. This roller is made in two parts or sections, as shown in Figs. 5 and 6, in order to permit two boards of unequal thickness to be fed into the machine on opposite sides of the central guide D and have them held down and fed forward properly to the horizontal matching-heads and have the several hold-downs of the machine act without unnecessary failure. Even where the two boards are of the same thickness it is desirable to have this feed-roller in two parts, in order to have the two boards fed forward, so as to hug the central guide D and the side guide d, respectively. These arrangements of the several parts of the divided feed-roll, which we have have applied, and of the holding-down fingers hereinafter described, and of the grooved guides, are especially made necessary in this machine by the presence and relation to the other parts of the horizontal tonguing-cutters, hereinafter described.

On the frame A of the machine are bolted the stands S S, of the usual form, to support the upper feed-roll F F. These stands have slots s s, Fig. 5, made through them edgewise, extending vertically.

The yoke M is made to extend across the machine from one stand S to the other, and is secured at its ends to the stands by bolts b b, passing through the slots s s, which slots allow the shanks of the bolts to slide up and down in them when the yoke M is adjusted up and down. The yoke M has its body part made in the form of a semi-cylinder to cover and protect the divided feed-roll F F. At each end a shaft n passes vertically downward through the yoke, in which it is journaled, so as to revolve and be carried therewith. Each shaft n is screw-threaded on its lower portion, which passes through a nut n',

secured to the frame A, as shown in Fig. 5 and in dotted lines in Fig. 3. On the upper end of each shaft n is attached a bevel-pinion inclosed by a box m on yoke M, as shown in dotted lines. A horizontal revolving shaft n^2 extends from side to side of the machine, passing through the boxes $m\ m$, and carries bevel-pinions which engage with those on the upper ends of shafts $n\ n$, as shown by dotted lines. The function of the boxes $m\ m$ is to support the shaft n^2 and cover these bevel-pinions. One end of shaft n^2 is squared to receive a wrench or crank, by which the shaft may be revolved and the yoke M adjusted up and down to any desired position upon the stands S S.

The yoke M has attached to its concave internal portion a vertical transverse partition m^2, which divides its interior into two parts or chambers, and at each end it also has a head or transverse end inclosing-wall. Vertical guideway-slots are formed in each face of the partition m^2 for the boxes $o\ o$, which carry the inner and adjacent ends of the shafts of the rollers F F, and corresponding vertical guide-slots $u\ u$ are formed in the end heads of the yoke M for the boxes $o'\ o'$, which carry the outer ends of the same shafts. Each feed-roller F is therefore vertically adjustable in the yoke M by the movement of its boxes $o\ o'$ up and down in these slots.

Through the top of the yoke M a rod r is passed downward to each box o and o', and has its threaded end screwed into a corresponding screw-threaded hole in the top of the box, the rods $r\ r$ being arranged to slide up and down through the holes in the yoke, through which they pass. Each of the rods r is made with an eye in its upper end, by which it is connected to an arm v', extending horizontally from the shaft V, to which it is attached so as to move therewith. This connection is made by a bolt r', passing through the eye of the rod r and the end of arm v', which is bifurcated to receive the eye of the rod and allow the bolt to be arranged as shown in Fig. 6, and the hole through the arm which receives this bolt is to be elongated slightly lengthwise of the arm, so as to give the necessary play to allow the rod r to move up and down through the yoke.

Each feed-roll F is provided with a shaft V, which is made rectangular in cross-section and is supported and revolves in bracket-arms m^3, which are attached to or cast upon the yoke M. The bracket-arms m^3 are bored out cylindrically, and the shaft V has tubular sleeves $v^2\ v^2$, made cylindrical on their exteriors to fit the holes in the bracket-arms and rectangular internally to fit the shaft. They thus form cylindrical bearings for the shaft in the supporting-arms. The arms v' are driven firmly upon the square parts of the shaft V. It will be observed that when one end of the feed-roll F is raised by the board passing under that end the lifting of the rod r and arm v', connected with that end of the feed-roller, will turn thes haft V and lift the arm v' and rod r, connected with the other end of the roller-shaft, thus causing both ends of the feed-roller F to rise and fall alike, no matter where the lifting action of the board comes underneath the roller. One of the arms v' on each roller F has an extension v^3 bolted to it, on which is placed the weight v^4, which serves to hold down the roller upon the board, and this weight by the construction described bears equally on both ends of the feed-roller by means of the shaft V and its attached arms v', connected with those ends.

The shafts $w\ w$ of the feed-rolls F F have gear-wheels $w'\ w'$ secured to them and pass, respectively, through the end of links w^2, the opposite ends of which links embrace the shaft w^3. Another pair of links w^4 embrace the same shaft w^3 at one end and embrace the shaft of the gear-wheels w^6 at the other end. These gear-wheels w^6 engage with the gear-wheels w^7, attached to the shaft of the lower feed-roll F', one end of which extends at w^8, Fig. 5, beyond the frame of the machine, and has a pulley attached to it, by which it is driven from the counter-shaft of the machine, engaging with the gears w' and w^6, and mounted on the shaft w^3 is the gear w^5. Now, as the links connecting the shafts w and w^3 with the shaft of gear-wheel w^6 are free to move upon these shafts they allow the train of gearing to act in the ordinary manner as an expansion-gear and drive the shafts of feed-roll F F from the shaft of feed-roll F', whether these feed-rolls be raised more or less above this lower roll.

The vertical transverse partition m^2 of the yoke M has one of its sides m^4, Fig. 5, secured to it by bolts m^5, so that it can be removed and the boxes $o\ o$ of the feed-rolls be released from the guideways in this partition.

When it is desired to have one end of a feed-roll F bear upon the lumber harder than the other end, the rod r at that end of this feed-roll can be detached from the arm v' and screwed out from the shaft-box o or o' and again attached to the arm v', and this adjustment will cause that end of the feed-roll to continually bear harder upon the lumber than the other end, which will cause the board to travel more or less snugly against the guide D or d, as may be desired, thus giving full control over the bearing of the lumber against the guide.

$o^3\ o^3$ are the boxes of the lower feed-roll, which are held between the stands S and the supplemental stands S^2 and adjusted up and down by set-screws above and below them, as shown in Fig. 3.

On the face of yoke M are attached two brackets $m^7\ m^7$, which may be cast in one piece with the yoke, if desired. Through these brackets is passed the rod r^3, Figs. 3 and 4, which is held in place by the set-screw r^4. On this rod are pivoted bearing-fingers $z\ z'$, which extend above the rod in the form

of arms z^2 z^3. The bearing-fingers z' are made longer from the rod r^3 outward than the bearing-fingers z, and therefore press upon the lumber, as shown in Fig. 3, at a greater distance from the feed-rolls preceding them. This enables us to hold down a thinner piece of lumber and a thicker piece of lumber, which are following each other through the machine at the same time, while the matching-heads H H are operating upon both of these pieces of lumber, as shown by dotted lines in Fig. 3, and prevents the thicker piece of lumber from raising the finger from the thinner piece, as it would if only one finger were used, in order to have the benefit of the finger-pressure itself. These fingers z and z' are held apart at the proper distance upon the rod r^3 by collars or sleeves r^5, which allow them to turn on the rod, and their arms z^2 z^3 are provided with weights z^5, which hold the fingers down upon the lumber. A pair of these fingers z z'—one longer and one shorter—is provided for each division F of the upper feed-roll, so that thicker boards may follow thinner ones, or vice versa, and be held down under each division.

Immediately following the cutter-heads H H we provide pressure-guides h h to bear upon the tongues formed by these cutter-heads and assist in holding down the lumber. These guides are bolted to the stand h' by screw-bolts h^2, Figs. 7, 8, and 9, passing through slots in the guides, which allow the guides to slip up and down on the stand to accommodate their lower edges to different dimensions of lumber. Each guide h is provided with a thumb-screw h^3, passing through an offset on the upper end of the guide, in which the thumb-screw is journaled, and extending down into the stand h', to which the guide is attached, in which it engages with a screw-threaded hole corresponding to it. By this construction the thumb-screw h^3 may be turned by hand and move the guide h up and down to any desired adjustment. The stand h' is attached to the guide-strip D by screw-bolts, as shown. One of the guides h may be adjusted independently of the other if the work requires it.

It will be observed that the rods r r form mere extensions of the boxes o o' of the feed-roll F for convenience in attaching the arms v' of the shaft V to them, and that as such extensions they could be made or cast in one piece with the boxes, although we prefer to make them as shown, because of their capacity for being lengthened or shortened to adjust the squeeze of the roll at its ends.

What we claim as new, and of our invention, is—

1. The combination of the feed-roll F, its shaft-boxes o o', supporting the shaft at its ends and arranged to move up and down in guideways as the roll yields to the lumber, and the shaft V, adapted to revolve in supports rigid with relation to said guideways, which are located above the bed of the machine and provided with arms v' v', projecting above and fixed thereto and pivotally connected to said boxes at their outer ends, substantially as described.

2. The combination of the vertically-adjustable yoke M, the feed-roll F, its shaft-boxes o o', supporting the shaft at its ends and arranged to move up and down in guideways on said yoke, and the shaft V, adapted to revolve in supports connected to said yoke and provided with arms v' v', fixed thereto and pivotally connected to said boxes at their outer ends, substantially as described.

3. The combination of the feed-roll F, its shaft-boxes o o', supporting the shaft at its ends and arranged to move up and down in guideways, the extensible rods r r, connected therewith, and the shaft V, adapted to revolve in supports rigid with relation to said guideways and provided with arms pivotally connected at their outer ends to said extensible rods, substantially as described.

4. The combination of the yoke M, attached to standards on each side of the frame, two feed-rolls F F, their respective shaft-boxes o o', supporting the ends of their shafts and arranged to move with said feed-rolls up and down independently of each other in guideways on said yoke, and shafts V V, respectively adapted to revolve in supports connected to said yoke and respectively provided with arms v' v', fixed thereto and pivotally connected at their outer ends to the said boxes of their respective feed-rolls, substantially as described.

5. The combination of the yoke M, provided with ends having vertical guideways or slots u therein arranged to receive the roll-shaft boxes o' and allow them to move up and down therein, and with the central partition m^2, having corresponding vertical guideways therein arranged to receive the roll-shaft boxes o o and allow them to move up and down therein, and the two feed-rolls F F, having their shafts respectively supported in said boxes o o' on each side of said partition, whereby the inner and outer ends of each roll-shaft, with their boxes o o', are adapted to move up and down alike and independently of said yoke or the other roll-shaft, substantially as described.

6. The combination of the vertically-adjustable yoke M, provided with ends having vertical guideways or slots u therein arranged to receive the roll-shaft boxes o' and allow them to move up and down therein, and with the central partition m^2, having corresponding vertical guideways therein arranged to receive the roll-shaft boxes o o and allow them to move up and down therein, and the two feed-rolls F F, having their shafts respectively supported in said boxes o o' on each side of said partition, and the weight v^4, arranged by suitable levers and a connecting-shaft to bear upon said boxes, whereby the inner and outer ends of each roll-shaft, with their boxes o o', are made to move up and

down alike and be pressed upon by said weight independently of said yoke or the other roll-shaft, substantially as described.

7. The combination of the tonguing cutter-heads H H, mounted upon horizontal shafts and placed, respectively, above and below the path of the lumber, and two fingers z z', pivoted upon the yoke M, carrying the divided roll F F, adapted to bear upon the upper surface of the same board or of successive boards passing through the machine, the finger z' taking its bearing upon the board farther from the feed-in end of the machine than the finger z, whereby the adjacent ends of the successive boards passing through the machine may be simultaneously held down by said fingers, substantially as described.

8. The combination of the tonguing cutter-heads H H, mounted upon horizontal shafts and placed, respectively, above and below the path of the lumber through the planing-machine, the central guide D, the divided feed-roll F F, sustained by yoke M and fingers z z', the stand h', the guide h, arranged to bear upon the finished tongue after said cutter-heads, and secured upon said stand by bolt h^2, passing through its vertical slot, and the thumb-screw h^3, journaled in an offset of said guide-strip above said stand and engaging with a threaded hole in the latter, substantially as described.

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