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E. R. HYDE.

SURFACE GRINDING OR PLANING MACHINE.

No. 405,706. Patented June 25, 1889.

Fig. 1.

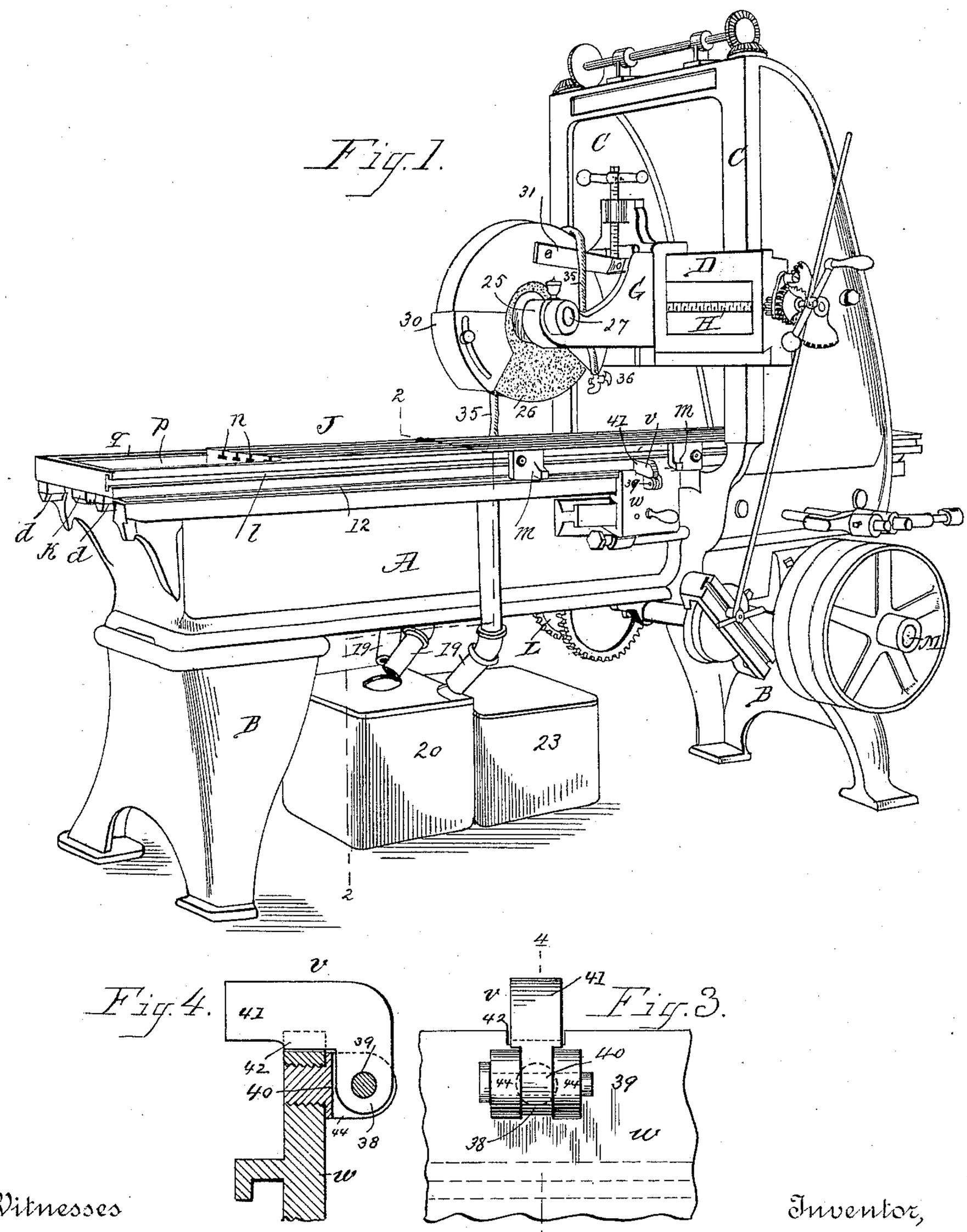

Fig. 4.

Fig. 3.

Witnesses

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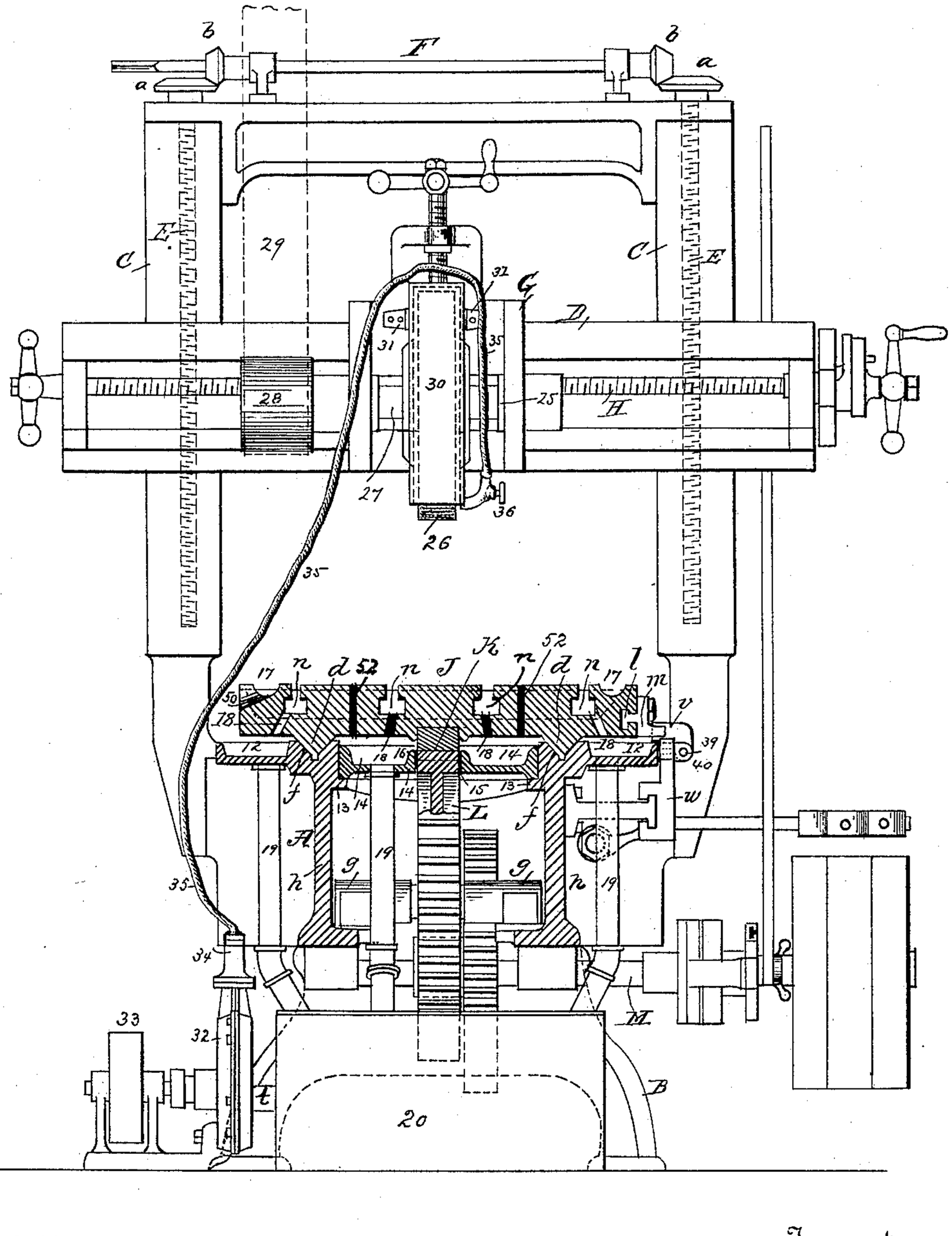
Fig. 2.



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E. R. HYDE.

SURFACE GRINDING OR PLANING MACHINE.

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Fig. 5.

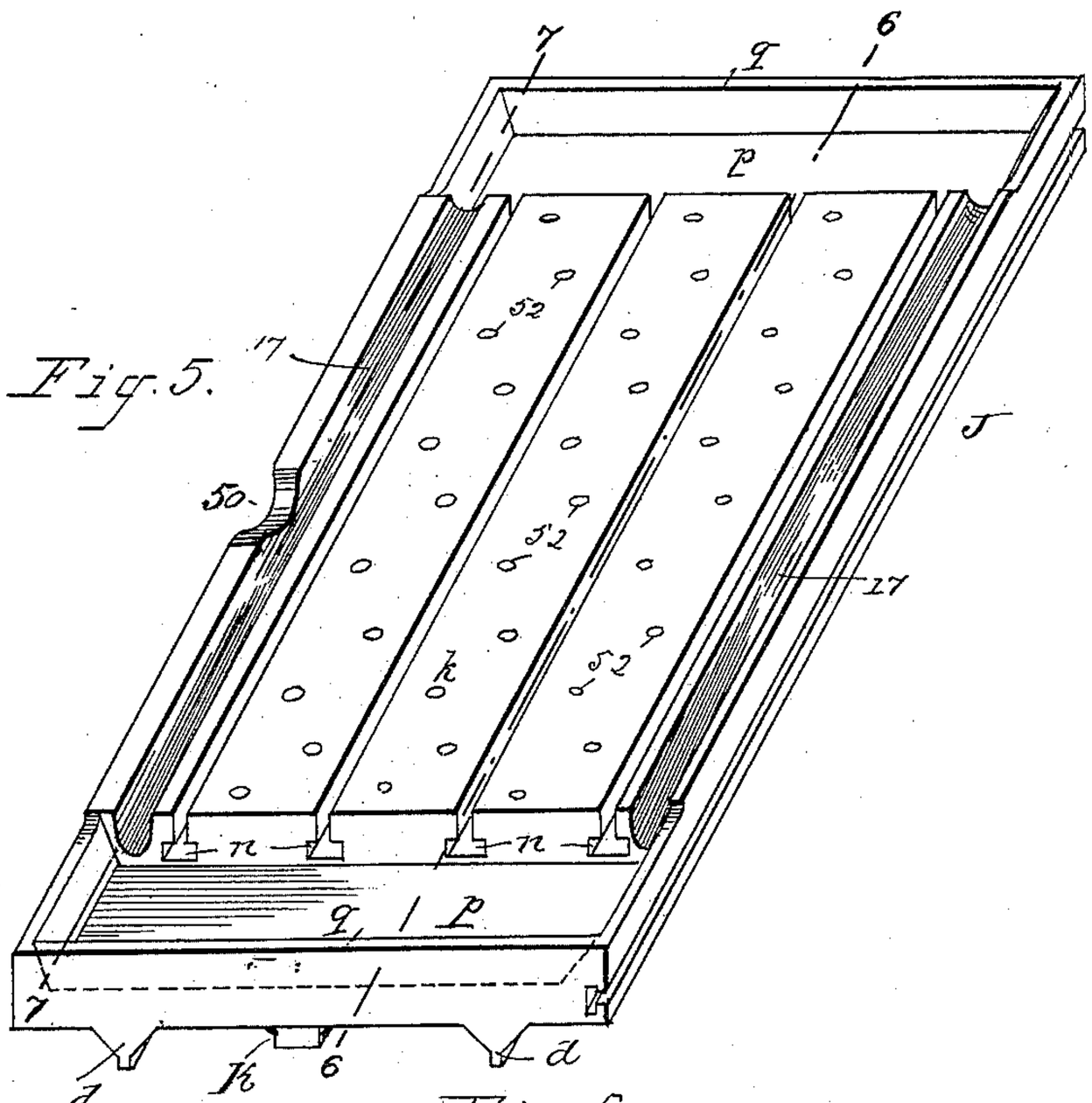


Fig. 6.

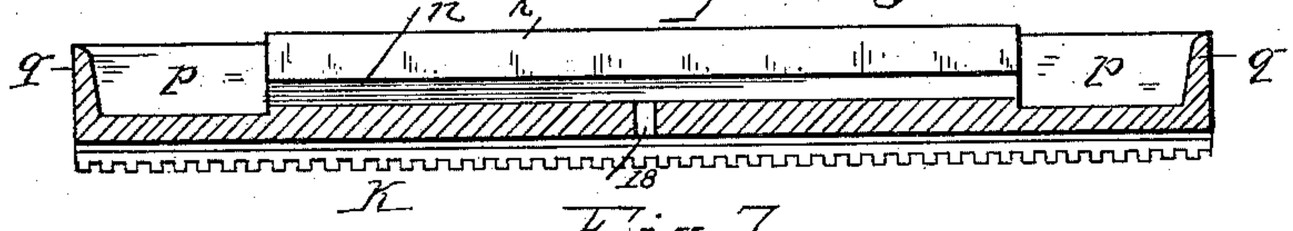


Fig. 7.

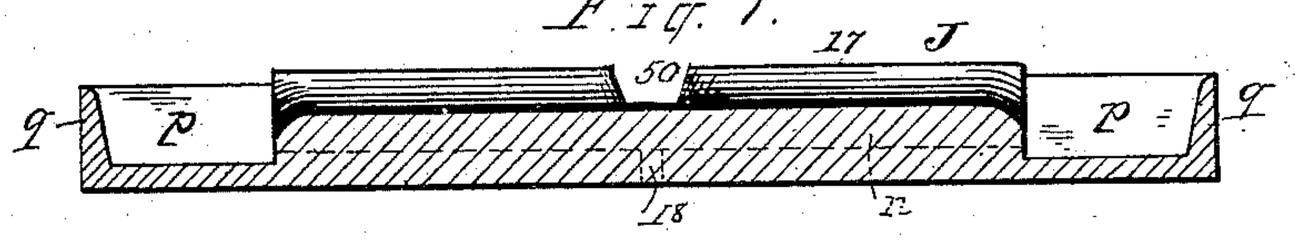


Fig. 8.

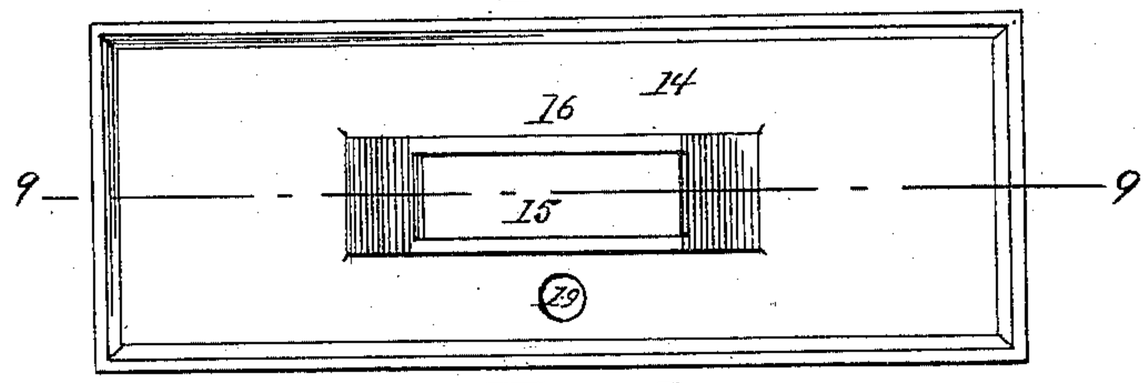
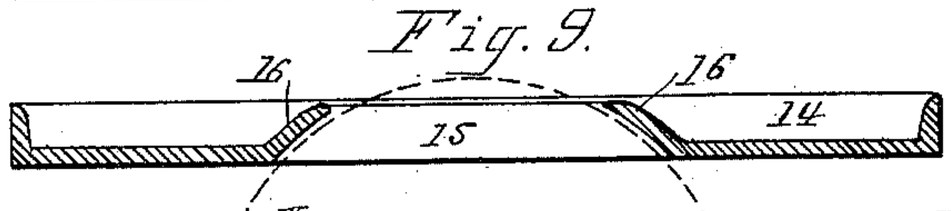


Fig. 9.



Witnesses

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(No Model.) 4 Sheets—Sheet 4.

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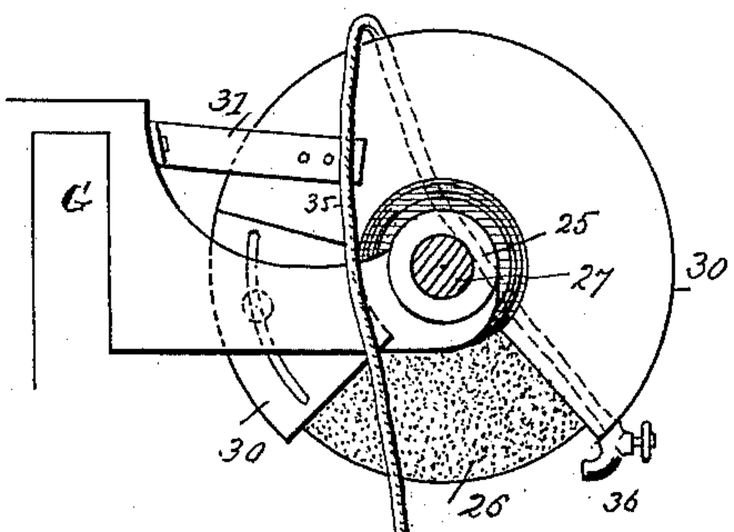
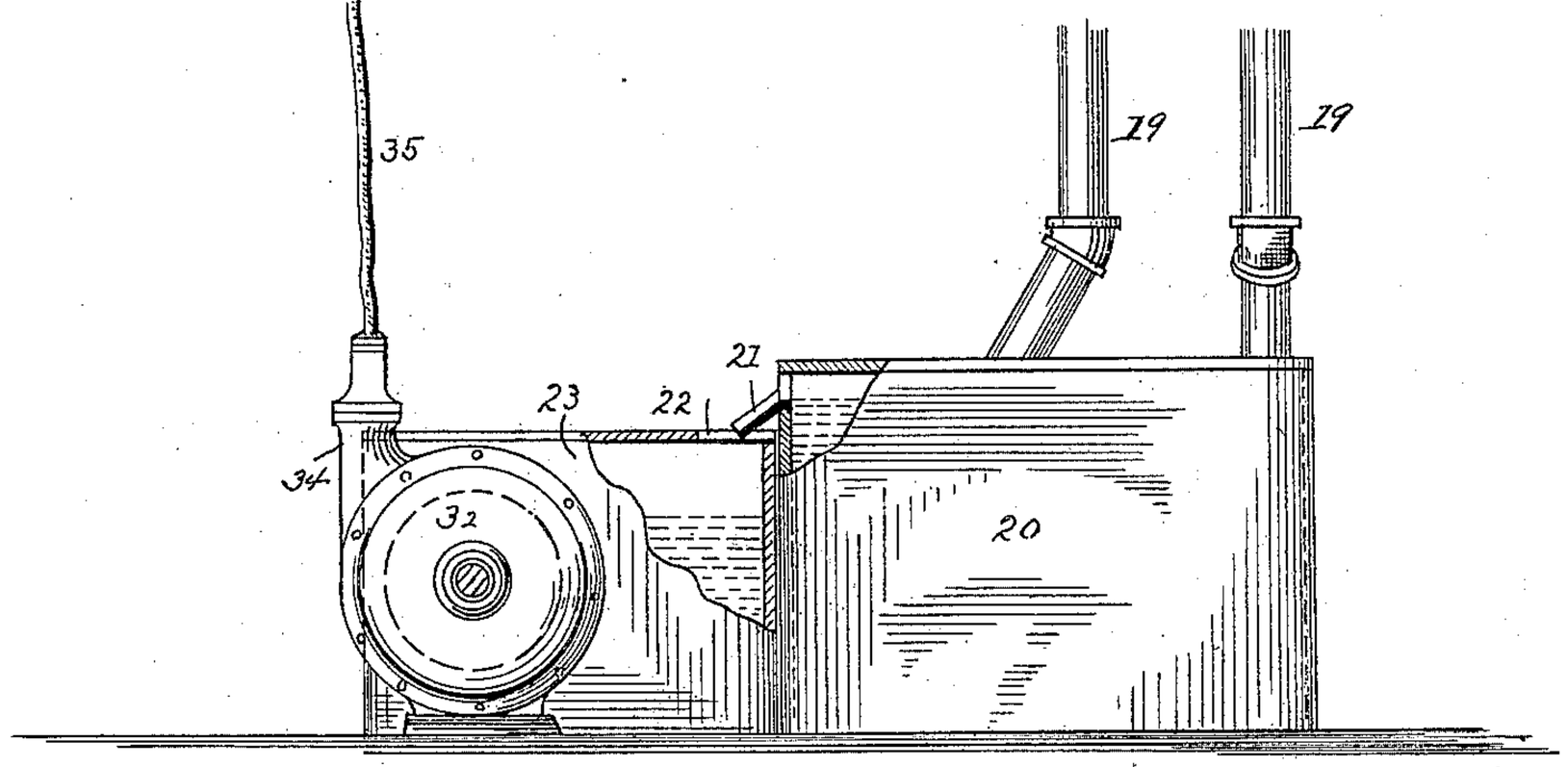


Fig. 10.



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UNITED STATES PATENT OFFICE.

ELWIN R. HYDE, OF SPRINGFIELD, MASSACHUSETTS.

SURFACE GRINDING OR PLANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 405,706, dated June 25, 1889.

Application filed March 22, 1888. Serial No. 268,160. (No model.)

To all whom it may concern:

Be it known that I, ELWIN R. HYDE, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Surface Grinding or Planing Machines, of which the following is a specification.

This invention relates to improvements in machines for planing metal surfaces by grinding, operating in many respects similar to the well-known metal-planing machines, in which a tool is used for removing the stock; but the grinding means in the present class of machines consists of a rotatable grinding wheel or disk suitably supported and driven, the work to be operated upon thereby being placed upon and carried by a table or platen which, under suitable driving mechanism, is given a reciprocating motion in a horizontal plane upon its supporting and guiding bed and in proper relation to said grinding-wheel; and in the class of grinding-machines to which this invention particularly relates water is to be supplied to and upon the face of the grinding-wheel, or upon the face of the metal being ground thereby, for the purpose of preventing an expansion of the metal and consequent inaccuracy in the plane-surfacing; and the object of the present invention is, principally, to provide means for the conveyance of water to and upon the grinding-wheel or the work being ground thereby, for then securing its disposition in the machine, whereby it will be confined and retained within desirable limits, and whereby any sediment or grit will be eliminated therefrom, and for then reconveying same to the work, and otherwise to increase the efficiency of machines of this class; and to these ends the invention consists in the constructions and combinations of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying drawings the present invention is illustrated, and similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the surface grinding or planing machine. Fig. 2 is a cross-section thereof on line 2 2, Fig. 1. Figs. 3 and 4 are respectively a front view and a sectional view of details to be hereinafter described. Fig. 5 is a perspective view of the reciprocating table for supporting and carrying the work. Figs. 6 and 7 are longitudinal sectional views of Fig. 5 on the lines 6 6 and 7 7 thereof, respectively. Fig. 8 is a plan view of one of the water-receiving pans located in the bed under the table, and Fig. 9 is a section thereof on line 9 9. Fig. 10 is a view illustrative of the apparatus for purifying the water used with the machine and for reconveying such purified water to the grinding-wheel.

In the drawings, A represents the stationary bed of the machine supported on the standards B, and carrying at one end portion the uprights C, on which is guided the horizontal slide-bar D, and adapted for a vertical adjustment by the engagement therewith of the screw-threaded shafts E, operated through the gearing *a b* on the turning of the shaft F. Mounted upon the said slide-bar D is the sliding block G, with which the screw-threaded shaft H engages for a cross-feed of said block, said shaft H being intermittently rotated under the action of the mechanism interposed between it and the driving-shaft.

J represents the table, having on its under side the longitudinally-extending V-ribs *d*, guided in the V-ways *f* of the bed, said table being provided with the longitudinally-extending rack K, into which meshes the gear-wheel L, mounted in suitable bearing-boxes *g* of the bed, and driven, through intermediate gearing, by the main shaft M, and all these mentioned parts being generally, in their construction and combination with each other, all as usual and common in metal-planing machines, except as hereinafter particularly set forth.

The bed A at its upper part and each side of its side walls *h* is provided for its whole length with longitudinally-extending shallow trough-shaped wings or gutters 12, closed at their ends, and inside of said side walls *h* of the bed the same is provided with oppositely-disposed longitudinal shelves 13, upon which is placed a removable metal pan 14, of a length substantially that of the bed, or otherwise, as desired. The pan 14 at its middle portion is provided with an aperture 15, surrounded by a wall or lip 16, as seen in Figs. 2, 8, and 9, through which aperture the periphery of the

gear L is passed to mesh with the rack K of the table, the provision of the surrounding lip serving to retain the holding capability of the pan and to guard the escape or splashing of water therefrom upon and about the said gear.

The table J is provided with the usual T-groove *l* in one edge for the support and guiding of the adjustable shipping-dogs *m*, and is, for the greater portion of its length within its ends, of the solid platen form, as at *k*, beyond which, at each end, are the depressions or packets *p p*, surrounded by the lip *q*, the whole being integrally cast, and the intermediate solid platen portion *k* of the table is provided with the parallel longitudinal T-grooves *n*, let in from its upper side and of any suitable number, and as so far described the table is as usual in planer-tables. Within the upper side of the solid platen portion *k* of the table, near each edge thereof, are longitudinally-extended gutters 17, and from the middle portion of one or both of said gutters 17 a lateral chute or gutter 50 extends to the edge of the table J, substantially as seen in Figs. 5 and 7, and from the middle portion of each of the T-grooves *n* a duct or passage 18 leads to the bottom of the platen, the said passages from the T-grooves being arranged with their outlets over the gutters 12 and intermediate pan 14. From the intermediate pan 14 and each of the side troughs 12 12 pipes lead downwardly, under the lower ends of which a tank 20 is disposed. The said tank 20 at one top edge is provided with a spout 21, under which is located the opening 22 of another tank 23, and the table may, if desired, be provided with vertical holes 52, extending through it for securing the work upon the table.

The slide-block G, mounted on the slide-bar D, is provided with suitable journal-boxes 25 for the support and bearing of an emery or other suitable grinding-wheel 26, the extended shaft 27 of which at one side carries a pulley 28, to be independently driven through a belt 29 from an overhead shaft. The greater portion of the sides of said grinding-wheel and the whole of its periphery, except a small arc thereof at its lower portion, is surrounded by a hood or shell 30, suitably supported in a fixed position in relation to the slide-block G by brackets 31, there being a slight space between the inner walls of said hood and the outer surface of the grinding-wheel. There is entered at an intermediate portion of the height of said tank 23 the inlet-pipe *t* of a centrifugal pump 32, driven by a pulley 33, to the outlet-pipe 34 of which a flexible hose 35 is connected, which passes therefrom to or into proximity with the periphery of the grinding-wheel, being supported in any suitable manner, and there provided with a suitable stop-cock 36.

In the operation of the present machine with the work placed upon the table, with the slide-block adjusted to present the grinding-wheel at and upon the upper surface thereof, and under the well-known driving mechanism, the table is reciprocated to carry the work to and fro under the rotating grinding-wheel, the slide-block being given an intermittent cross-feed, as usual. Water being pumped from the tank 23, through the hose 35, is directed upon the work and the periphery of the wheel, the hood 30 preventing any centrifugal throwing of same, and thence running onto the planer-table J, a portion of it flows directly into the T-slots *n*, and thence, through the passages 18, into the pan 14 and troughs 12 of the bed, other portions thereof at the sides of the table running into the gutters 17, and where the side gutter 50 is provided at one or both sides of the table J. The water thence passes laterally into the side gutters 12 of the bed, and water within the side gutters 17 of the table which does not thus pass off laterally will be guided longitudinally into the end pockets *p*, and thence into and through the T-grooves *n* and passages 18 to the said pan and gutters of the bed; and water may pass from the surface of the table, through the holes 52, into the intermediate pan and side gutters of the bed. The water, thence running through the pipes 19, is conveyed from said side gutters and pan to the tank 20, all sediment and particles of comminuted metal and emery, &c., being allowed to gravitate to the bottom of said tank 20, the clear portions thereof thence passing through the spout 21 at the upper edge of said tank, into the secondary tank 23, to be again forced to and upon the work, as before, and so on continuously as long as the grinding operation is continued.

In Figs. 1, 2, 3, and 4 is illustrated a novel construction of the abutment *v* on the slide *w*, against which the adjustable dogs *m* on the side of the table come in contact in their to-and-fro movement to secure the operation of the usual reversing mechanism by the movement of said slide *w*. The abutment *v* is made in the form of an angular latch by one arm 38, pivoted, as at 39, in ear-pieces 44 of a stud 40, screwed into or otherwise attached to said slide *w*, its other arm 41 being so formed as to project across and beyond the upper edge of said slide into the line of travel of said dogs *m*, increased rigidity thereto being given when the upper edge of the slide is notched or rabbeted, as at 42, into which the lower edge of the arm 41 is allowed to rest, it of course being seen that this pivoted angular arm is capable of being quickly swung out of the line of travel of the said dogs, permitting the withdrawal of the table in either direction without changing the adjustment of the dogs, as desirable in many instances in the use of a planer.

What I claim as my invention is—

1. In a surface grinding or planing machine, the combination, with a bed having the uprights C, the horizontal slide-bar D, and the adjustable slide-block G, and a table adapted

to be reciprocated on said bed, of a rotatable grinding-wheel journaled on said block, and a hood 30, supported on said block and nearly surrounding said grinding-wheel, substantially as described.

2. In a surface grinding or planing machine, the combination, with the stationary bed A, provided with the longitudinal side gutters 12 12, of the carriage movable on said bed provided with water-conducting passages therein and therethrough discharging into said side gutters of the bed, substantially as described.

3. A surface grinding or planing machine bed provided between its side walls with the longitudinal pan, substantially as described.

4. A planer-table comprising the intermediate platen portion *k* and the end pockets *p*, the said platen portion provided with the T-slots *n*, leading to said pockets, and the passages 18, leading downwardly from said T-slots through the table, substantially as described.

5. A planer-table comprising the intermediate platen portion *k* and the end pockets *p*, said platen portion having the T-slots *n*, leading to said pockets and the side gutters 17, and the passages 18, leading downwardly from said T-slots through the table, substantially as described.

6. A planer-table comprising the intermediate platen portion *k* and the end pockets *p*, said platen portion having the longitudinal side gutters 17, and a chute or gutter 50, leading laterally from said longitudinal gutters, substantially as described.

7. In a surface grinding or planing machine, the combination, with the bed thereof provided with the side troughs 12 12 and intermediate pan 14 and the slide-block G, of the rotatable grinding-wheel 26, the surrounding hood supported from said slide-block, the reciprocating table provided with the intermediate platen portion *k* and the end pockets *p*, said platen portion being provided with the T-slots *n*, in communication with said pockets, and having the passages 18, the tank 20, and pipes 19, leading from said troughs and pan thereto, a supplemental tank 23, and a conduit leading from the upper part of said tank 20 to said tank 23, a pump in communication with said tank 23, and a conduit extending from said pump to the grinding-wheel, substantially as and for the purpose set forth.

8. In a surface grinding or planing machine, the combination, with the bed thereof provided with the side troughs 12 12 and intermediate pan 14 and the slide-block G, of the rotatable grinding-wheel 26, the surrounding hood supported from said slide-block, the reciprocating table provided with the intermediate platen portion *k* and the end pockets *p*; said platen portion being provided with the side gutters 17 and the T-slots *n*, in communication with said pockets, and having the passages 18, the tank 20, and pipes 19, leading from said troughs and pan thereto, a supplemental tank 23, and a conduit leading from the upper part of said tank 20 to said tank 23, a pump in communication with said tank 23, and a conduit extending from said pump to the grinding-wheel, substantially as and for the purpose described.

9. In a surface grinding or planing machine, the combination, with the bed thereof provided with the side troughs 12 12 and intermediate pan 14, provided with the lip-surrounded aperture 15, the driving-gear journaled in bearings of the bed and projecting through said aperture 15, and the slide-block G, of the rotatable grinding-wheel 26, the surrounding hood supported from said slide-block, the reciprocating table provided with the intermediate solid platen portion *k* and the end pockets *p*, said solid portion being provided with the T-slots *n*, in communication with said pockets, and having the passages 18, the tank 20, and pipes 19, leading from said troughs and pan thereto, a supplemental tank 23, and a conduit leading from the upper part of said tank 20 to said tank 23, and a conduit extending from said pump to the grinding-wheel, substantially as and for the purpose described.

10. In a planing-machine, the combination, with the reciprocating table having the adjustable dogs *m m*, of the slide *w*, provided with the notch 42, the stud 40 screwing therein having the ear-pieces 44, and the abutment *v*, comprising the angularly-arranged arms 38 and 41, the former pivotally hung in the ear-pieces of said stud, and the latter adapted to be swung to rest in said notch 42, and to project into the line of travel of said dogs, and also to be swung out of such line of travel, substantially as shown and described.

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Witnesses:
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