No. 854,950. PATENTED MAY 28, 1907.

G. J. KEPPLINGER.

PLANING AND SANDPAPERING MACHINE FOR FLOORS.

APPLICATION FILED MAY 12, 1906.

2 SHEETS—SHEET 1.

Fig. 2.

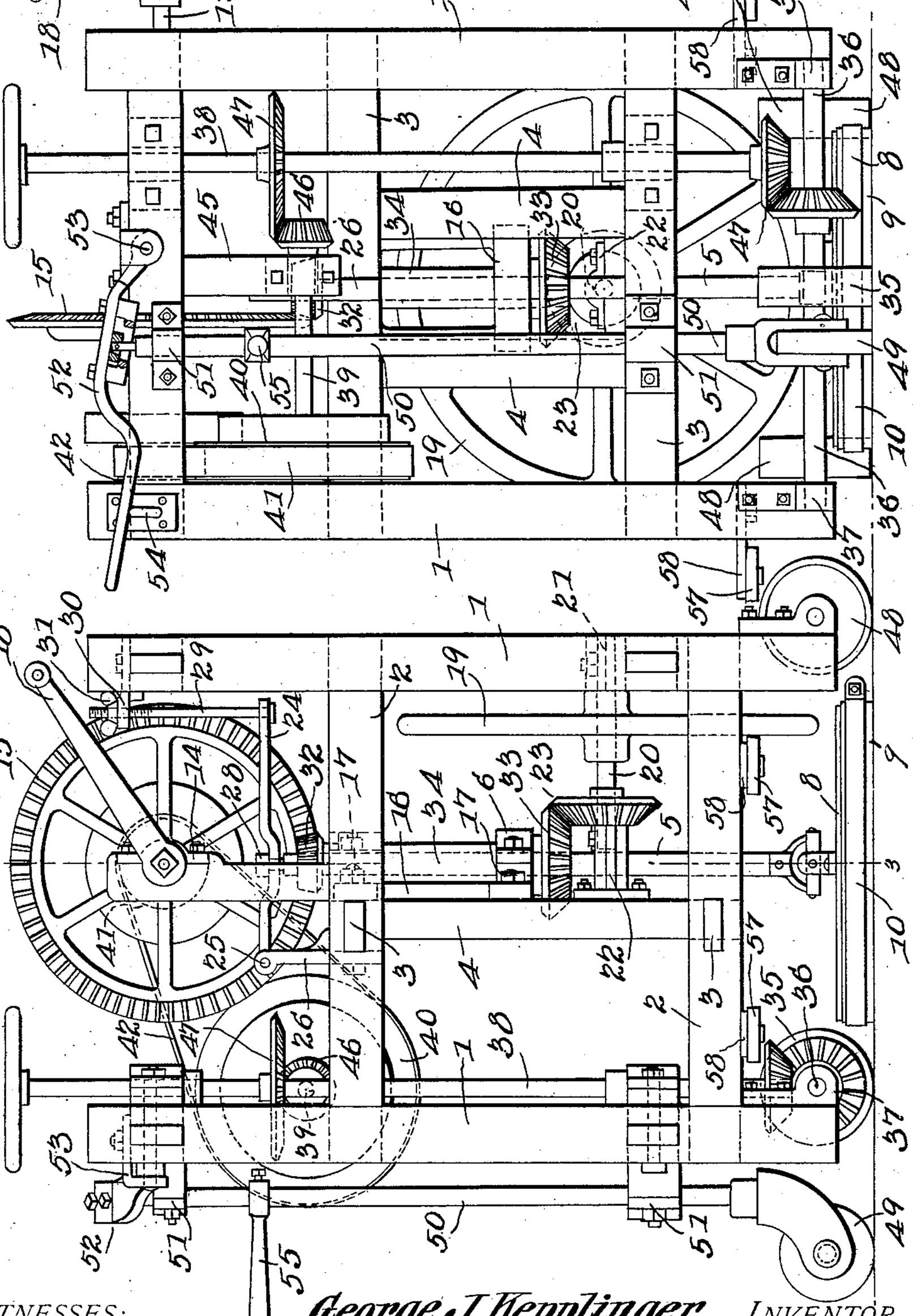

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

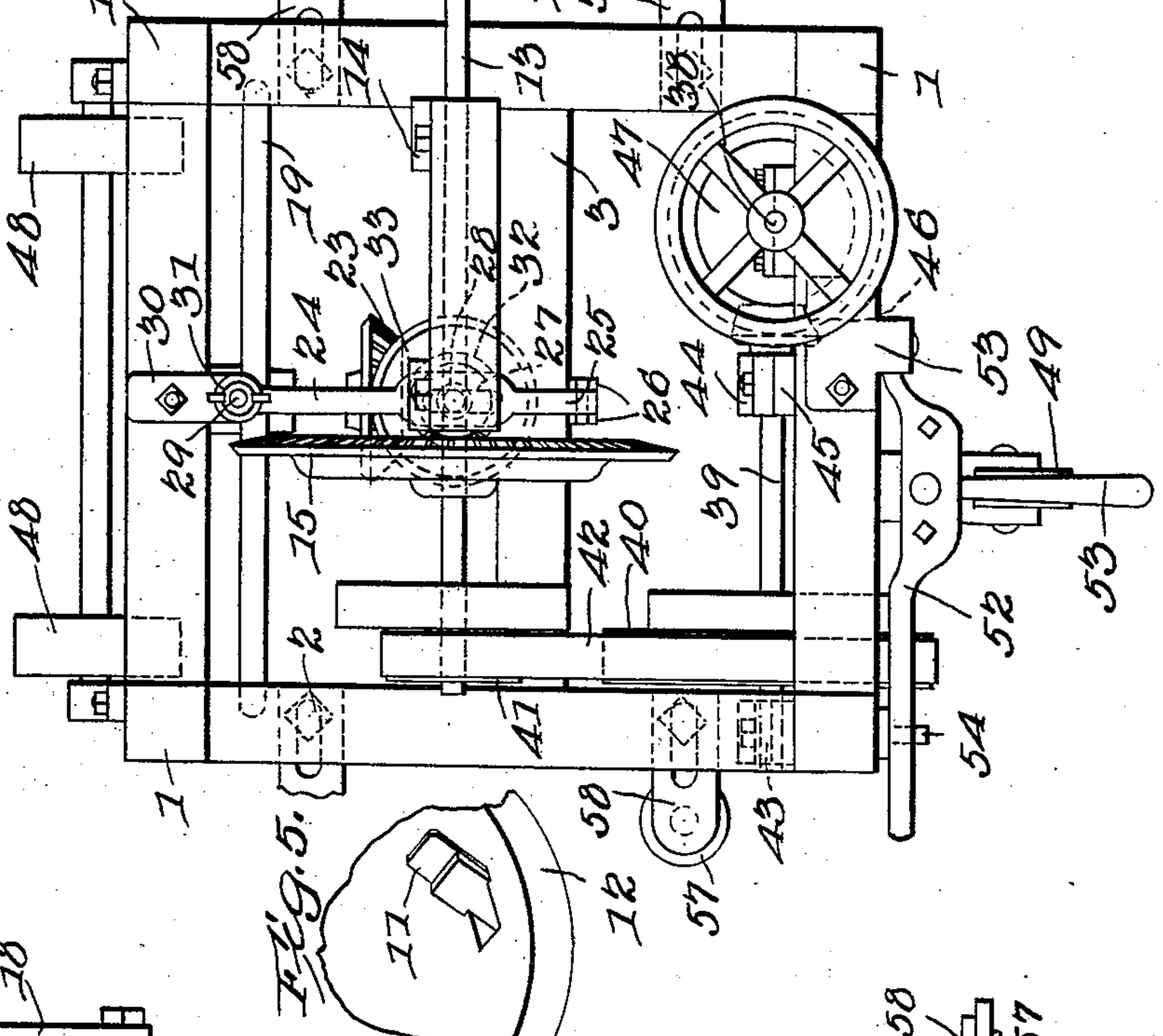

Fig. 5.

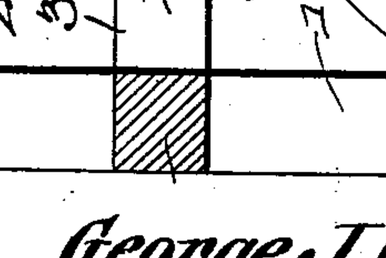

Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE J. KEPPLINGER, OF DWIGHT, ILLINOIS.

PLANING AND SANDPAPERING MACHINE FOR FLOORS.

No. 854,950. Specification of Letters Patent. Patented May 28, 1907.

Application filed May 12, 1906. Serial No. 316,567.

To all whom it may concern:

Be it known that I, GEORGE J. KEPPLINGER, a citizen of the United States, residing at Dwight, in the county of Livingston and State of Illinois, have invented a new and useful Planing and Sandpapering Machine for Floors, of which the following is a specification.

The present invention relates to a planing and sand-papering machine for finishing floors of dwellings, ten-pin alleys, dance halls, and the like, and it relates more particularly to that type of machine which is self propelled from the same source of power that rotates the plane or sand-paper disk.

It has for one of its objects to provide a machine of this character which is of improved construction, easy to operate, and capable of producing very effective results.

Another object of the invention is to provide means whereby the machine can be propelled or fed bodily over the floor being finished at any desirable speed, or can be maintained stationary to operate for a more or less longer time at any particular point of the floor at the will of the operator.

A further object is the equipment of means for enabling the machine to be steered or guided in a very easy manner so that it can be quickly transported from place to place on the floor being finished.

Still another object of the invention is the provision of a simple and effective arrangement for adjusting the shaft carrying the plane or sand-paper disk, and means for mounting the said disk on the shaft.

With these and other objects in view, the invention comprises the various arrangements and combination of parts, to be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a side elevation of the planing and sand-papering machine. Fig. 2 is a rear view thereof. Fig. 3 is a vertical section on line 3—3 Fig. 1 and looking in the direction indicated by the arrow. Fig. 4 is a plan view of the machine, and Fig. 5 is a perspective view of a portion of the plane carrying disk.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Referring to the drawings, the supporting structure, which may be of any desired construction, preferably comprises, as shown, a main frame composed of four corner uprights or standards 1 connected by the side bars 2 extending transversely and spaced apart between the standards, and an intermediate or secondary frame composed of two horizontal bars 3 extending parallel to the front side of the machine and connected to the cross bars 2 of the sides of the machine, and two suitably spaced posts or uprights 4 arranged between the horizontal bars 3. These parts of the frames are preferably made of wood of substantial dimensions, as, for instance, three by three stock, and are connected by mortise and tenon joints, thereby forming a strong and substantial structure.

Arranged at about the center of the machine is a vertical shaft 5 mounted for rotation in bearings 6 carried by the secondary frame. To the lower end of this shaft, and suspended therefrom by a universal joint 7, is a disk 8, which is rotated by the shaft. Two disks are adapted to be employed with the machine, the one shown attached to the machine being adapted to carry the sand-paper for finishing the floor. As shown in Figs. 1 and 3, the sand-paper is of such a size that it covers the bottom face of the disk, as shown at 9, and turns over the peripheral surface of the disk and is clamped thereon by a band or hook 10. The plane carrying disk is shown in fragmentary view in Fig. 5, wherein one of the bits is indicated at 11. In practice, a plurality of bits are employed which are angularly displaced around the disk 12 at suitable distances. The disk may be of any desired construction, as also may be the plane bits carried thereby.

The disk carrying shaft 5 is rotated by a horizontally extending driving shaft 13, as clearly shown in Figs. 3 and 4. The driving shaft is journaled in bearings 14 which are supported on the secondary frame of the machine, and the rotation of the driving shaft transmits rotary motion to the disk carrying shaft through a power multiplying miter gear 15. The bearings 6 for the shaft 5 are formed on a cast metal frame 16 that is bolted to the secondary frame by the bolts 17, or is otherwise suitably secured thereto. The upper end of this frame projects to the top of the machine and carries the journal bearing 14 of the driving shaft. At one end of the driving shaft is secured an operating crank,

or other device, 18. In order to insure uniform running of the machine, a fly wheel, indicated at 19, is provided. This is mounted on a shaft of its own, indicated at 20 in Fig. 3, which is supported at one end in a journal bearing 21 mounted on the front, lower cross bar 2, and at its rear end in a journal bearing 22 mounted on the secondary frame of the machine. The fly wheel is driven from the shaft 5 by means of a miter gear 23. The fly wheel is located inside the main frame of the machine at the front, lower portion thereof.

In order to raise and lower the planing or sand-papering disks, the shaft 5 is supported at its upper end on a lever 24 that is fulcrumed at 25 in a bracket 26 supported on the secondary frame, as shown in Fig. 1. The connection between the lever and the upper end of the disk carrying shaft 5 is such as to permit the shaft to be rotated without hindrance. One means for accomplishing this comprises a slot 27 in the lever 24 through which a bolt 28 extends and screws into a tapper bore in the upper end of the shaft, the end of the shaft and the head of the bore engaging on opposite sides of the lever, as shown in Figs. 3 and 4. The front end of the lever is adjustably supported by means of a link, bolt, or other device, 29, connected at its bottom end to the lever and extending at its upper end through an eye 30 and held therein by a thumb nut 31 resting on the eye. By this means, the disk can be elevated from the floor so as to permit the machine to be transported from place to place, or it can be lowered and adjusted with respect to the floor for the finishing operation on the latter. It will be observed that the plane, or the sand-paper, can be adjusted to the floor with great nicety.

To permit the shaft 5 to be moved longitudinally without disengaging the members of the gears 15 and 23, the wheels or members 32 and 33 of the said gears are rigidly connected together by a sleeve 34, as shown in Fig. 3, and the gears are feathered to the shaft 5 by the feather 34′. The sleeve is held in relatively stationary position by the bearings 6. By this arrangement, the shaft 5 can be rotated, while, at the same time, it is being elevated or lowered, and the driving connections between the driving shaft 13 and the fly wheel 19 are maintained in operative relation.

The machine is adapted to be fed bodily over the floor being finished during the planing or sand-papering operation. For this purpose, a propelling wheel or roller 35, shown more clearly in Figs. 1 and 2, is provided, which is mounted on a horizontal propelling shaft 36 journaled in bearings 37 at the bottom ends of the rear uprights 1 of the machine. The shaft 36 is driven from the driving shaft 13 through a vertical shaft 38 and a horizontal shaft 39, which latter is connected to the main driving shaft 13 through a variable speed belt and pulley mechanism whose parts are indicated at 40, 41 and 42. The shaft 39 on which the pulley 40 is mounted is journaled at the rear, upper end of the machine in bearings 43 and 44, Fig. 4. As shown in Fig. 2, the journal bearing 44 is mounted on the lower end of a depending arm 45 extending from the upper, rear cross bar 2 of the main frame. Miter gears 46 and 47, seen more clearly in Figs. 1 and 2, operatively connect the shaft 38 with the shafts 36 and 39. It will thus be seen that while the sandpapering or planing disk is driven, the propelling wheel 35 is also driven and causes the machine to be moved bodily. The front end of the machine is supported on the rollers 48 that freely rotate on an axis parallel with that of the propelling roller. The speed at which the propelling roller is rotated is considerably reduced by means of the belt drive and the miter gear 46. The ratio of the gears and the pulleys of the belt transmission may be varied according to the requirements.

The several rollers on which the machine moves rotate in a fixed plane, and, in order to permit the machine to be guided in different directions, a steering wheel or roller 49 is arranged at the rear of the machine and is mounted on a vertical, oscillatory shaft 50. This shaft is journaled in bearings 51 and is capable of a slight longitudinal movement therein, as well as an oscillatory movement. At the upper end of the steering shaft 50 is a lever 52 that is operatively connected with the shaft to raise or lower the same. The lever is fulcrumed in a bracket 53 secured on the upper, rear cross bar of the main frame, and the opposite end of the lever is held in raised or lowered position by engagement with opposite sides of a stop, or lug 54, Fig. 2. When the parts are in the position shown, the steering mechanism produces no effect, and the machine will move forward or rearward in one plane. When it is desired to steer the machine, the setting lever 52 is disengaged from the stop 54 and depressed to such a point that it may engage under the stop. By this movement, the rear end of the machine is elevated about the front rollers 48 as an axis. This raises the propelling wheel off the floor, so that if the operating lever 18 for driving the machine is rotated, the machine cannot be moved thereby. In order to turn the machine to one side or the other in a straight ahead direction, the steering shaft 50 is turned by the steering handle 55 extending rearwardly from the shaft adjacent the upper end thereof. By turning the handle 55 to the right, the steering roller will be turned in the same direction, and then by pushing the machine, or pulling it, the machine will be moved to the right in a forward or rearward direction, according to which di-

rection the machine is pushed or pulled. After the machine is moved to the new position desired, the steering shaft 50, with its roller 49, is again elevated so as to let the machine rest on the propelling roller 35. The machine will then feed over the floor by the rotation of the crank 18 during the planing or sand-papering operation. It will thus be seen that the machine can be readily guided from point to point on the floor being finished, or be held stationary by means of the steering mechanism, or be moved in a straight line in a forward or rearward direction by the operating crank 18.

In order to prevent the machine from being moved into contact with the walls of the room and probably causing damage, the machine is provided with rollers 57 at its sides that are adjustable outwardly from the frame by means of the plates 58 on which they are mounted, and by which they are secured to the lower side cross bars 2 of the frame. The rollers are arranged at such a point as to bear against the base board of the room and thus keep the machine away from the walls.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative, and that the invention can be carried out by other means.

What is claimed is:—

1. The combination of a frame comprising uprights and cross pieces connected therewith, of a central shaft mounted for rotation and longitudinal movement on the frame, a tool flexibly connected at the lower end of the shaft, a transverse shaft mounted on the frame, a gearing between the shafts, a lever for raising and lowering the central shaft, a crank for turning the second shaft, rollers on which the frame is supported, a mechanism between the second shaft and one of the rollers for propelling the frame and attached parts, a steering roller, means for raising and lowering the frame relatively to the steering roller to remove the propelling roller from the floor.

2. In a machine of the class described, the combination with a suitable frame and a set of rollers for supporting it, of a tool mounted on the frame and arranged to coöperate with the floor or other work when the frame rests on the supporting rollers, driving devices for the tool, operative connections between the latter and one or more of the supporting rollers for moving the device during the operation of the tool, and means for disengaging the driving rollers from the floor to permit operation of the tool independently.

3. In a machine of the class described, the combination with a suitable frame, supporting and driving rollers mounted thereon, a tool held by the frame and arranged to coöperate with the floor or other work, and operative connections between the tool and the driving rollers for causing simultaneous operation, of a steering wheel adjustable vertically relative to the frame, and means for effecting the relative vertical adjustment between the steering wheel and the frame for moving the driving rollers out of coöperative relation with the floor or other support.

4. In a machine of the class described, the combination with a suitable frame, supporting and driving rollers mounted thereon, a tool carried by the frame, operating mechanism for the tool, and operative connections between the tool operating devices and the driving rollers for effecting a simultaneous operation, of a supplemental roller adjustable vertically relative to the frame, and a lever pivotally attached to the frame and pivotally connected to the supplemental roller for adjusting the latter vertically relatively to the frame.

5. In a machine of the class described, the combination of a supporting structure, a tool carrying shaft, a driving shaft geared thereto, rollers on which the front end of the structure is mounted, a propelling means on the rear of the structure and a mechanism for guiding the movement of the machine and for rendering the propelling means inoperative, comprising a steering roller at the rear end of the structure, a vertical shaft for carrying the roller, means for turning the said shaft, and means for adjusting the said vertical shaft relatively to the structure to disengage the propelling means from the floor.

6. In a machine of the class described, the combination of a supporting structure, a tool carrying shaft, a driving shaft geared thereto, rollers on which the front end of the structure is mounted, a propelling roller, means for driving the propelling roller, and a steering mechanism, comprising a roller, a shaft on which the roller is mounted, a steering lever on the roller, and means for adjusting the structure vertically to the shaft of the steering roller for transferring the weight of the machine from the propelling to the steering rollers, or vice versa.

7. In a machine of the class described, the combination of a supporting structure, a tool carrying shaft, a driving shaft geared thereto, rollers on which the front end of the structure is mounted, a propelling roller, means for driving the propelling roller, and a steering mechanism, comprising a roller, a shaft on which the roller is mounted, a steering lever on the roller, and a lever connected with the shaft of the steering mechanism for transferring the weight of the machine from the propelling to the steering roller, or vice versa.

8. In a machine of the class described, the combination of a supporting structure, a tool carrying shaft, a driving shaft geared thereto, rollers on which the front end of the struc-

ture is mounted, a propelling roller, means for driving the propelling roller, and a steering mechanism, comprising a roller, a shaft on which the roller is mounted, a steering lever on the roller, a lever fulcrumed on the said structure which is connected to the upper end of the shaft of the steering mechanism, and a stop with which the said lever is adapted to engage.

9. In a machine of the character described, the combination with a suitable frame and an operating shaft mounted thereon, of a tool shaft mounted in angular relation to the operating shaft, a sleeve movable axially of the tool shaft and keyed to turn therewith, operative connections between said sleeve and operating shaft, a bevel gear arranged on the lower end of said sleeve, a fly wheel, and a shaft therefor journaled in the frame on an axis transversely of the tool shaft and having a bevel gear coöperating with that of the sleeve, a bearing through which the tool shaft passes and in which the adjacent end of the fly wheel shaft is journaled, and means for adjusting the tool shaft axially relatively to said sleeve.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE J. KEPPLINGER.

Witnesses:
C. E. FOERSTERLING,
A. I. GRAVES.