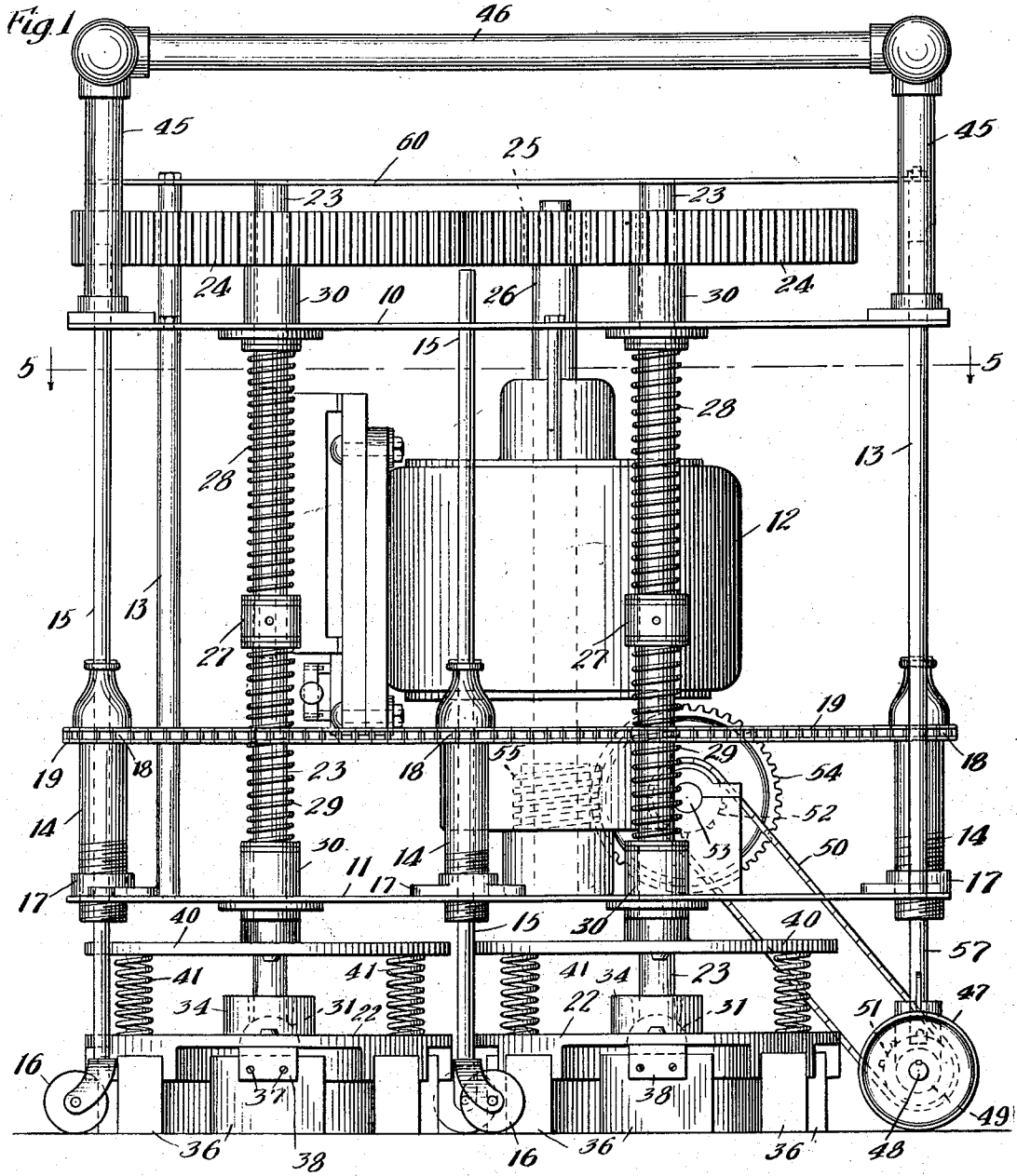


M. L. SCHLUETER.
 MACHINE FOR SURFACING STONE FLOORS.
 APPLICATION FILED MAR. 16, 1911.

1,000,696.

Patented Aug. 15, 1911.

3 SHEETS—SHEET 1.



Witnesses:

Wm. Giger
 Pearl Abrams.

Inventor:
 Max L. Schlueter

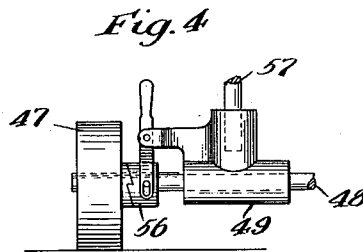
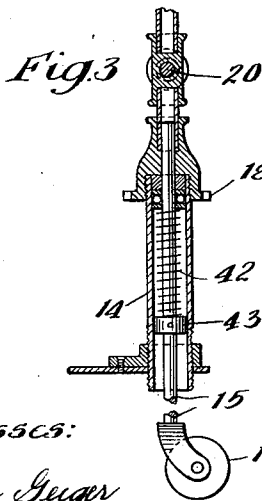
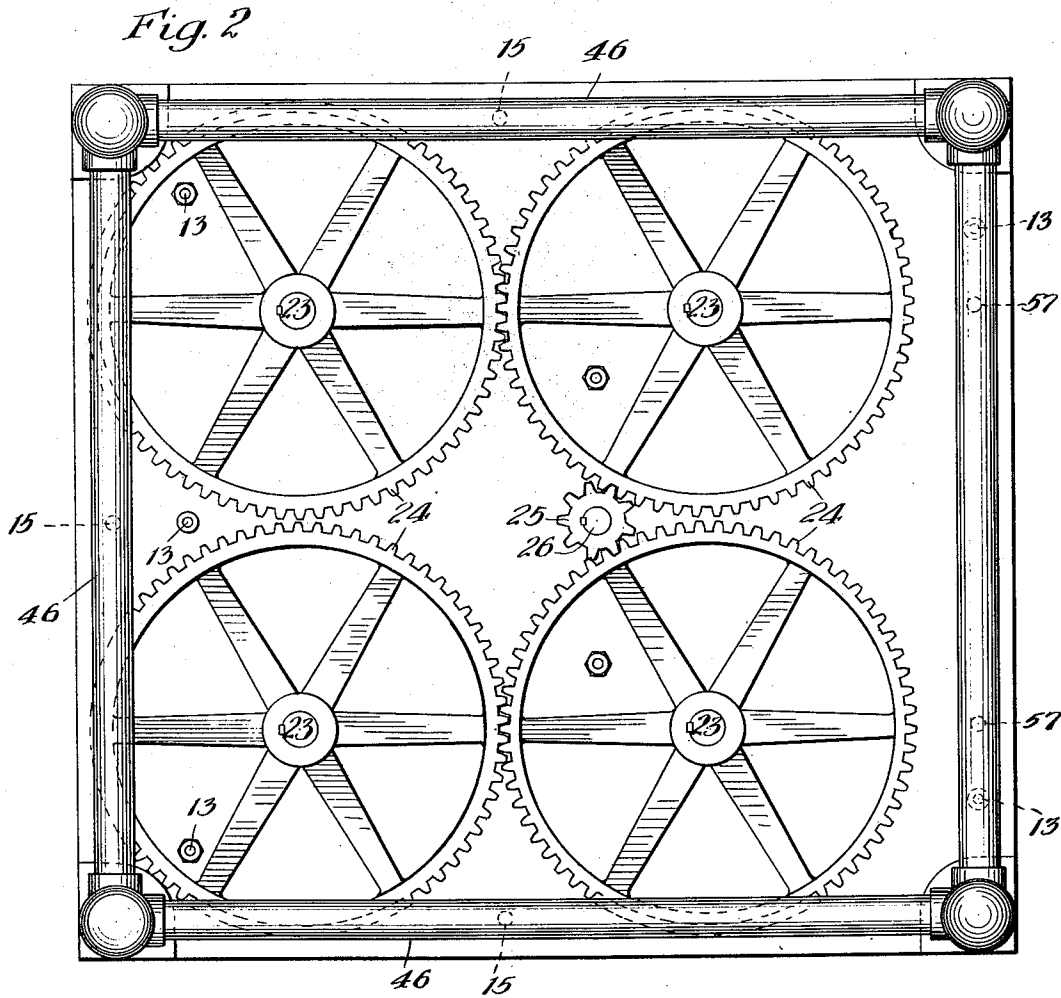
By Munday, Ervart, Wood & Clarke
 Attys.

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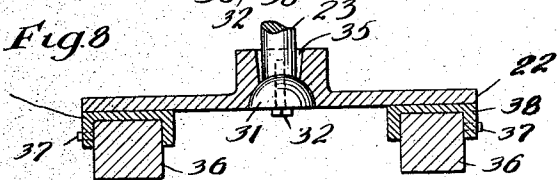
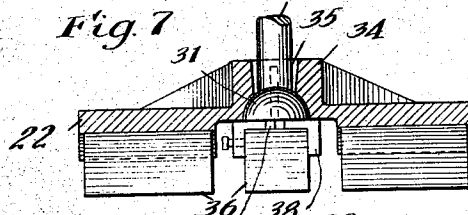
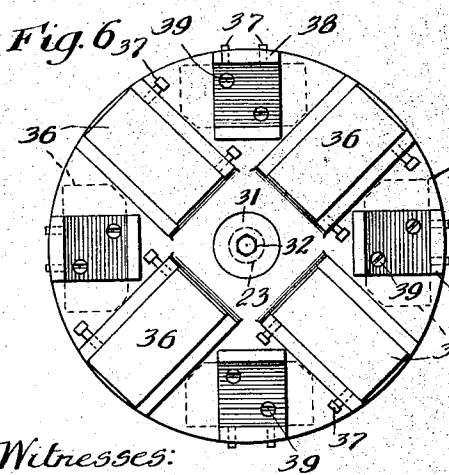
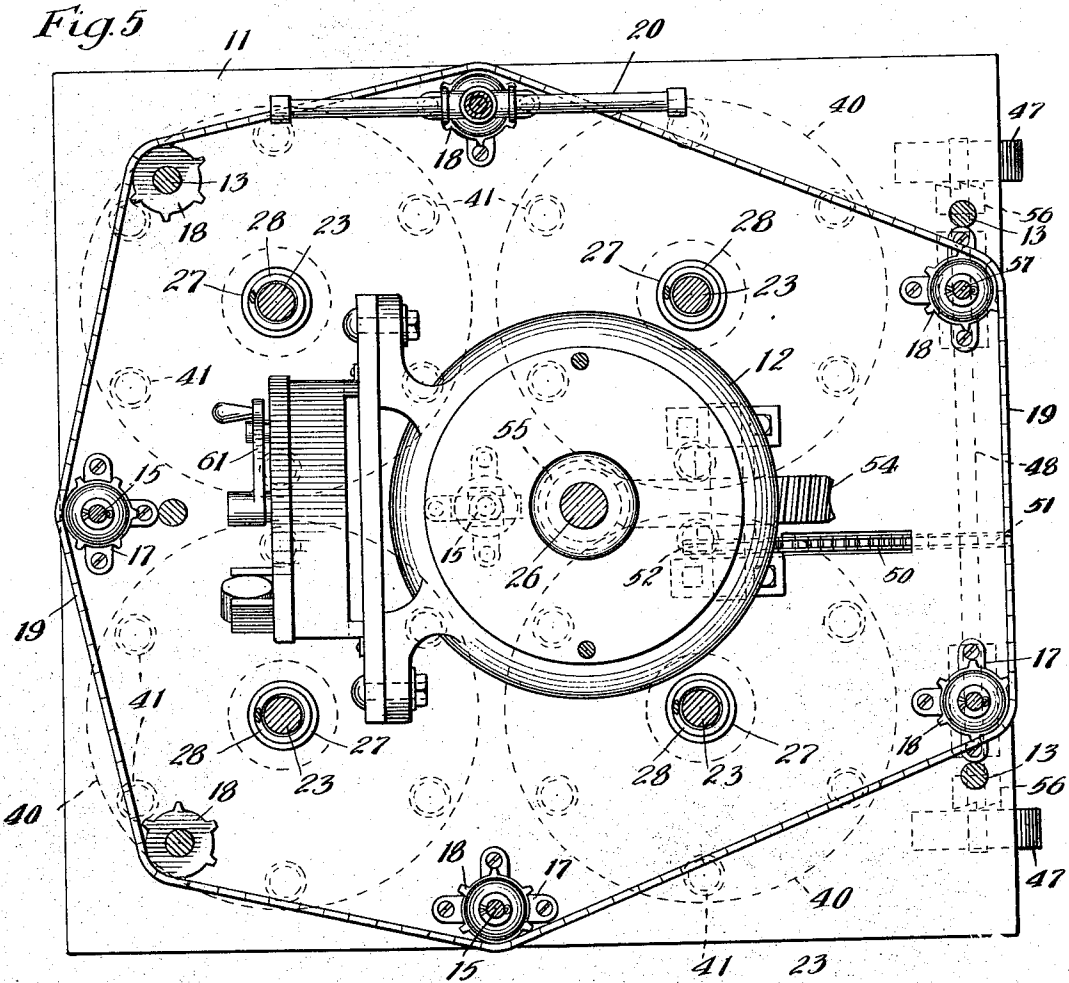
Attys

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3 SHEETS—SHEET 3.



Witnesses:

Wm. Geiger
 Carl W. Adams

Inventor:
 Max L. Schlueter

By Munday Evans Aderck Clarke
 Attys.

UNITED STATES PATENT OFFICE.

MAX L. SCHLUETER, OF CHICAGO, ILLINOIS.

MACHINE FOR SURFACING STONE FLOORS.

1,000,696.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed March 16, 1911. Serial No. 614,765.

To all whom it may concern:

Be it known that I, MAX L. SCHLUETER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Surfacing Stone Floors, of which the following is a specification.

This invention relates to machines for surfacing stone cement or tile floors.

It employs revolving disks imposed flatwise on the floor, and contains features of construction whereby the disks are adapted to be used on surfaces which are uneven.

The invention also contains features whereby it is adapted at will to do a small amount or a large amount of surfacing on different portions of the floor according to the requirements of the work, so that the entire floor may be given a uniform level surface.

The nature of the invention is fully set forth below, and will be understood from the accompanying drawing and the subjoined description.

In the accompanying drawing Figure 1 is an elevation and Fig. 2 is a plan of the machine. Fig. 3 is a vertical section of one of the caster wheels. Fig. 4 is an elevation of one of the guiding wheels. Fig. 5 is a section on the line 5—5 of Fig. 1. Fig. 6 is a bottom plan of one of the disks; Figs. 7 and 8 are vertical sections at right angles to each other of said disks.

In said drawing 10 and 11 are horizontal plates between which the electric or other motor 12 of the machine, together with other moving parts of the machine are located. The plates are united by vertical bolts 13 so that one is immovable as to the other, and they are adapted to be raised or lowered unitedly by the engagement of threaded sleeves 14 mounted on the stems or vertical shafts 15 upon which the caster wheels 16 are swiveled, with the nuts 17 surrounding said sleeves and made fast to plate 11. The sleeves are rigid on the shafts 15, and each of them at its upper portion is rigidly attached to or integral with a sprocket wheel 18 meshing with a chain 19 extending entirely around the machine so that it is adapted to actuate all said sprocket wheels in unison. To one of said sprockets a hand bar or lever 20 is attached, and through it said chain is actuated and the sprockets rotated whenever any adjustment of the appa-

ratus is necessary, as for instance when the surfacing blocks become worn away, or when they are replaced by fresh and thicker blocks, or when the tension of the springs on the disk shafts requires regulating or when the machine is to be moved from place to place and the disks are raised above their operating planes.

The surfacing disks are shown at 22. They are arranged horizontally, and each is rotated by a vertical shaft 23, and a gear 24 at the upper end of the shaft. The shafts 23 are all keyed to the gears 24 but are free to move vertically through the same. A pinion 25 on the drive shaft 26 actuated by the motor 12, serves to actuate one or more of said gears 24, and the ones so actuated mesh with and actuate the others. Each shaft 23 carries a vertically adjustable collar 27 located centrally between its ends, and between such collars and the plate 10 are springs 28 encircling the shafts and supporting plates 10 and such portion of the weight of the machine as should be developed upon or borne by the disks. Between plate 11 and said collar other springs 29 are placed around the shafts. With this construction it will be seen that by lowering the collars 27 the lower springs can be compressed and cause increased pressure by the disks upon the floor, and that by raising the collars those springs will be expanded and the pressure upon the disks be lessened. Of course the adjusting of the collars will increase or decrease the tension of the upper springs as well as that of the lower ones, but this fact is not important, as variations in the pressure of the upper springs do not affect the operation of the machine materially. The upper springs support the mechanism when the disks are raised above their operating position and also when only a light pressure is desired to be put upon the disks, and also it will be noticed the springs described act as cushions to the machine so that if the disks rise or fall suddenly no severe shock is likely to be caused the machine thereby.

The disk shafts pass loosely through boxes or bushings 30 in the plates 10 and also in plate 11. The disks are also peculiar in their construction. They each are attached to their shafts in such manner that they are at liberty to tip in any direction rendered necessary by the unevenness of the surface upon which they are working, and to this end they

are attached to the shafts by a sort of universal joint seen at Fig. 8. In these joints hemispherical pieces 31, are bolted to the bottom of the shafts by bolts 32, and the lower plates 22 of the disks which carry the polishing blocks are provided with hubs 34 adapted to receive the shafts and said hemispherical pieces as shown. This feature leaves the plate 22 at liberty to tip in any direction necessary to enable it to conform to the surface being polished, the opening for the shaft being enlarged as seen at 35. The polishing or surfacing blocks 36 are secured to the under surfaces of plates 22 by screws 37 or by clamping them between raised ledges 38 by means of screws 39 as seen at Fig. 6. To insure the tipping of plates 22 in conformity with the surface being operated upon, so that the polishing blocks may be kept in action without regard to the character of said surface, I provide above the plates 22 a second plate 40 which is rigidly attached to the shaft and turns therewith, and place between each plate 40 and the corresponding plate 22 a series of vertical coiled springs 41 whose pressure is downward at all times and tends to force the plate 22 down upon the floor, at the same time allowing it to yield and conform to any unevenness therein. The labor of rotating the plate 22 is desirably devolved upon the springs 41.

The caster wheels 16 are preferably of the construction shown at Fig. 3 each having a spring 42 and a ring 43 surrounding the spindle 44 and within the sleeve 14. This figure illustrates the sprocket to which the lever 20 is attached. The caster wheels are employed in such number as may be needed, and the machine illustrated contains five, but a greater or less number may be used. I also prefer to extend the spindles or shafts 15 of some of the casters upward so they may be entered in the vertical posts 45 of the tubular top frame 45, 46. This frame is very convenient in moving the machine about, and as the disks can by the construction described be raised to inoperative position above the floor so that the entire machine will be then supported by the caster wheels, the utility of the tubular frame will be apparent.

The disks are made to revolve in opposite directions, each two opposing the other two, so that the machine has no tendency to travel while operating, but in moving the machine about, it is often desirable to guide its movements automatically, and for this purpose I make the caster wheels 47, 47 at one side of the machine of larger diameter than the others, and actuate them from the motor. To this end these wheels are secured rigidly to a cross shaft 48 supported in bearings 49, and such shaft is actuated by a chain 50 on sprockets 51 and 52, the latter being on a

horizontal shaft 53 carrying a worm gear 54 meshing with the worm 55 on the vertical drive shaft 26. Each of the wheels 47 is connected to shaft 48 by a clutch 56 as shown at Fig. 4 and consequently either of them can be used separately, or they may be used together as desired. If used together they will propel the machine either forward or back in a straight path, but if only one is used the corner of the machine at which such wheel is located will be moved cornerwise in a circle, while the opposite diagonal corner of the machine remains substantially stationary. As this movement may be continued indefinitely, it will be seen that the floor surface located within the circle so described by the moving corner of the machine will be acted upon repeatedly by the disks. This enables the reduction of any spots in the floor which are higher or more refractory than the balance. The wheels 47 are preferably provided with rubber tires so that they exert a traction power upon the machine. Vertical rods 57 extend upward from the bearings 49 and are free to turn in the bearings and act in a manner similar to the stems 15 of the caster wheels 16, being provided with like threaded sleeves 14 rigid upon them, and with sprocket wheels 18 meshing with chain 19.

A top plate 60 limits the upward movements of the disk shafts, and the switch 61 controls the motor 12. While I have shown the machine as equipped with a gang of four grinding or polishing disks, it will be understood that the invention is independent of the number of disks, and that any number either greater or smaller than four may be used.

I claim:—

1. The combination in a machine for surfacing stone floors or the like, of a plurality of surfacing disks, each united to an operating shaft by a universal joint allowing it to tip in conformity to the floor being surfaced, said shafts each having an adjustable collar secured centrally thereon, between which collar and a lower bearing of the shaft, a spring is coiled around the shaft, and a motor to which the shafts are geared and by which they are actuated.

2. The combination in a machine for surfacing stone floors or the like, of a moving supporting carriage, a plurality of surfacing disks, each united to an operating shaft by a universal joint allowing it to tip in conformity to the floor being surfaced, said shafts each having a collar secured centrally thereon, and also having springs coiled around it one above and the other below the collar, and confined between the shaft bearings and said collar, and a motor to which the shafts are geared and by which they are actuated.

3. The combination in a machine for sur-

facing stone floors or the like, of a moving supporting carriage, a plurality of surfacing disks each united to an operating shaft and a motor to which said shafts are geared and by which they are actuated, said shafts having freedom to move vertically in their driving gears, and their vertical movements in both directions being cushioned by springs.

4. The machine for surfacing stone floors or the like, having a plurality of surfacing disks each operated by a separate vertical shaft, a series of swiveled caster wheels adapted to support the machine from the floor, other wheels driven by power and acting to guide the movements of the machine, sprocket wheels on the stems of said wheels, a chain extending around the machine and operating said wheels in unison, and threaded devices on said stems whereby they may raise the machine from the floor.

5. The machine for surfacing stone floors or the like, having a plurality of surfacing disks each operated by a separate vertical shaft, a series of caster wheels, sprocket wheels on the stems of said wheels, a pair of non-swiveled caster wheels, sprocket wheels on rods extending upward from said last mentioned wheels, a chain engaging all said sprocket wheels, and threaded connections on said stems and said rods whereby the rotation caused by said chain raises the disks from the floor.

6. The machine for surfacing stone floors or the like, having a supporting carriage, a

plurality of surfacing disks each operated by a separate vertical shaft, a series of caster wheels 16, other caster wheels 47 driven by power and adapted to be driven independently of each other, and acting to guide and move the machine, and a motor and power connections from the motor to said guiding wheels, the machine being adapted to be raised above its acting position on said caster wheels.

7. The machine for surfacing stone floors or the like, having a supporting carriage, a plurality of surfacing disks each operated by a separate vertical shaft, a series of caster wheels 16, other caster wheels 47 driven by power and each adapted to be driven independently and acting to guide and move the machine, and a motor and clutching power connections from the motor to said guiding wheels, the machine being adapted to be raised above its acting position on said caster wheels.

8. The machine for surfacing stone floors and the like, having a series of supporting caster wheels, two of which upon one side of the machine are mounted on a horizontal shaft, and connected to the motor of the machine by separate clutches and are adapted to propel the machine either singly or together.

MAX L. SCHLUETER.

Witnesses:

PEARL ABRAMS,
EDW. S. EVARTS.