The invention relates to stone resurfacing machines and more especially to a marble resurfacing apparatus.

The primary object of the invention is the provision of a machine or apparatus of this character, wherein through the medium of a rotating element the surface of stone, marble or the like in place within a vertical wall or other structure can be operated upon for the resurfacing thereof and the polishing of the same, the machine or apparatus being readily portable so that it can be set up in confronting relation to the work to be acted upon thereby and the resurfacing element being readily adjustable or shiftable for an extended range of action upon the work and thus the necessity of hand resurfacing is eliminated with resultant dispatch in the handling of the work.

Another object of the invention is the provision of a machine or apparatus of this character, wherein the resurfacing element is self-adjusting to assure true operation upon the work for the resurfacing thereof and such element is motor-driven and is susceptible of adjustment vertically and horizontally within determined limits.

A further object of the invention is the provision of a machine or apparatus of this character, which is comparatively simple in construction, thoroughly reliable and efficient in its operation, assuring a thorough resurfacing of the work confronted thereby automatic in action and inexpensive to manufacture.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a top plan view of a machine or apparatus constructed in accordance with the invention.

Figure 2 is a front elevation thereof.

Figure 3 is an end elevation.

Figure 4 is a fragmentary enlarged elevation partly in section of the movable carriage and adjuncts.

Figure 5 is a top plan view thereof.

Figure 6 is a fragmentary detail elevation of the electric solenoid control for the raising and lowering means for the machine or apparatus.

Figure 7 is a sectional view on the line 7-7 of Figure 6.

Figure 8 is a top plan view of the parts shown in Figure 7.

Figure 9 is a vertical sectional view through the resurfacing element of the machine or apparatus.

Figure 10 is a fragmentary sectional view on the line 10-10 of Figure 8.

Figure 11 is a fragmentary detail plan view showing diagrammatically the electric control mechanism of the machine or apparatus.

Figure 12 is an end elevation of a modification for the vertical adjustment of the runners of the machine or apparatus.

Figure 13 is a fragmentary top plan view of a still further modification.

Figure 14 is an end view thereof.

Figure 15 is a sectional view on the line 15-15 of Figure 13.

Figure 16 is a fragmentary sectional view through a further modified form of mounting for the resurfacing element.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

In Figures 1 to 11 of the drawings there is shown a machine or apparatus wherein the base 72 of the stand has equipped therewith spaced front and rear wheels 73 and 74, respectively, the axles for the latter wheels being carried in raising and lowering forks 75 swingingly connected with the base while the axles for the wheels 73 are fixed to the base and the purpose of the raising and lowering wheels 74 is to shift the same out of and into tractive positions. When the wheels 74 are in tractive position the same are held in that position by releasable latching pins 76 which are mounted in the base 72. When the wheels 74 are out of tractive position the base 72 will be jacked by a rest block or beam 77 superimposed upon a foundation and beneath the base 72 so that the machine or apparatus will be stationarily in confronting relation to work to be operated upon. Now when it is desired to transport the machine or apparatus the wheels 74 are lowered and by the travel of the wheels 73 and 74 upon the foundation the said machine or apparatus can be rolled from one locality to another.

Fixed to and rising from the base 72 is the vertical frame 78, it having at opposite ends the channeled tracks 79 for guide rollers 80 of runners 81 having forwardly projected horizontally disposed supporting arms 82 for a shiftable tracking board 83, it having at opposite ends thereof rack gears 84 meshing with racks 85 stationarily fitted with the arms 82 and these gears are common.
to a hand crank 86 so that the same can be
turned for the shifting of the board 83.
Movable upon the board 83 is a carriage 87, it
having traction rollers 88 movable in channeled
guide tracks 89 carried at opposite side edges of
said board 83. Upon this carriage 87 are the
spaced bearings 90 in which is journaled a hol-
low or tubular rotateable shaft 91 to which is
yieldably coupled at 92 the resurfacing element
including the disk 93 carrying the sectors 94 of
carbordum or other substance which are self-
adjusting and disposed concentrically upon the
disk 93 and are spring tensioned at 95, the self-
adjusting of the sector 94 permits the truing of
such sectors with relation to the work during the
resurfacing thereof in the operation of the ma-
chine or apparatus.
Upon the bearings 90 is fitted an electric motor
96 which through the driving gear 97 meshing
with a ring gear 98 fixed upon the shaft 91 drives
the latter. The shaft 91 has loose thereon the
reversing beveled gears 99 and 100, respectively,
these meshing with a driven gear 101 common
fixed upon a stud shaft 102 suitably journaled
upon the carriage 87 and having a worm screw
103 meshing with a worm gear 104 upon a stud
shaft 105 having a rack gear 106. This rack
gear 106 meshes with a toothed rack 107 fixed
longitudinally upon the tracking board
83 and concentric therewith for substantially its
length. Splined or keyed to the shaft 91 is a
friction clutch 108 which is located between the
gears 99 and 100 and is alternately engageable
therewith on the shifting of these gears 99 and
100 through the instrumentality of a shift bracket
110 slidably fitting a guide 110 on the carriage
87, the bracket 110 being provided with a clear-
ance 111 for the shaft 102 which passes there-
through. The guide 110 carries a spring finger
112 for engaging the bracket 109 to frictionally
hold the same in its shifted position. These
gears 99 and 100 reversely drive the carriage
87 on the board 83 and the reversing operation of
the gears 99 and 100 will be hereinafter fully
described.
At the top of the vertical frame 78 and suitably
journaled in bearings 113 is a winding and un-
winding shaft 114 which is common to windlasses
these being fixed to said shaft and on and
from which are wound and unwound raising
and lowering cables 115 which are engaged at 117 with
the runners 81 so that these will operate in unison
for the raising and lowering of the arms 82. The
shaft 114 is mounted at one end a hand crank
118 so that said shaft can be manually turned.
Fixed to the shaft 114 is a ratchet toothed
latching disk 119, the teeth 120 being located at
opposite sides thereof and are arranged to allow
a one-half revolution of the disk when released
by coasting latches or dogs 121 pivoted at 122
in suitable bearings or on a cross beam or bar 123 of
the frame 78, these dogs or latches 121 being lo-
cated at opposite sides of the disk 119 to cooper-
ate with the teeth 120 for the latching of said
disk against turning movement in one direction
while permitting the reverse turning of the disk
so that the runners 81 can be elevated for ad-
justment to any desired height on the frame 78.
When the runners 81 are elevated the teeth 120
on the disk 119 ratchet past the dogs or latches
121 while on the lowering of the runners it is
necessary to alternately release the said dogs or
latches 121. This is done by pressing the disk 119
as the dogs or latches are normally in the path
of these teeth and will latch the disk at each half
rotation thereof and in this manner on vertical
adjustment of the runners 81 on the frame 78 the
said runners can be held in vertically ad-
justed position.
Connected therewith the shift bracket 109 are
versely acting solenoids 124 included in inde-
pendent normally open electric circuits 125 and
126, respectively, which are closed by switches
127, these being located on the carriage 87 at
opposite ends thereof to be disposed in the path
of actuating pins 128 selectively engageable at
opposite sides of said carriage in holes 129 formed
in the board 83 and arranged spaced from each
other in a row longitudinally disposed of said
board so that when the carriage 87 is traveling
in one direction on the closing of a switch 127 the
solenoid 124 in that circuit closed by the said
switch will become energized for the shifting of the
bracket 109 for the operation of the clutch
103 to reverse the direction of travel of the car-
riage 87. These pins 128 selectively engaging the
holes 129 will control the extent of travel of the
carriage 87 on the board 83 and the direc-
tion wherein switches 121 automatically effect the
reversing of the travel of the said carriage
upon the board.
Connected with the dogs or latches 121 are re-
versely acting solenoids 123, these being included
in the circuits 125 and 126 and alternately oper-
ate simultaneously with the alternate action of
the solenoids 124 so that the said dogs or latches
121 will alternately release the latching disk 119
in this fashion change the position of the resurfac-
ing or polishing element including the cutting
sectors 94 on the disk 93.
The frame 78 has therein the diagonal braces
131 and is rigidly supported by adjustable props
132 connected therewith and with the base 72.
Electric current is supplied to the circuits 125
and 126 by a power line 133 as is shown in Fig-
ure 17 of the drawings. The solenoids 124 when
energized automatically shift the bracket 109 for
the reverse drive of the carriage 87 on the board
83 while the solenoids 130 operate to alternately
release the dogs or latches 121 from the disk 119
for the automatic lowering of the runners 81
simultaneously and in a step by step manner
with the operation of the bracket 109 for revers-
ing the direction of travel of said carriage.
The resurfacing element of the machine or ap-
paratus can be brought into position with re-
spect to the work when in a fixed position, as for
example, when included in the vertical wall of a:
building, so that the marble, stone or the like to be
resurfaced can be operated upon by the ma-
chine or apparatus for that purpose. The work-
ing location of the resurfacing element of the
machine or apparatus can be altered or changed
either automatically or manually and the cutting
blocks or sectors of this element are self-adjust-
ning in conformity with the surface acted upon
thereby for resurfacing operation.
In Figure 12 of the drawings there is shown a-
5 modification, wherein at the top of the frame of
the machine there is arranged at each end or
close to the front of such frame a windlass 134
to which is connected a raising and lowering
cable 135, it being trained over a guide pulley
136 which is located near the rear side or inter-
mediate the front and rear of said frame and
this end is coupled downwardly and attached at 137 to its companion sup-
porting arm 82 for a shiftable tracking board 83.
The windlass 134 is carried by an operating shaft 138 suitably journaled at 139 at the top of the frame of the machine.

In Figures 13 and 14 of the drawings there is shown a further modification, wherein there is located between spaced parallel boards 140 at the top of the frame of the machine guide pulleys 141, these being journaled at 142 adjacent to opposite ends of said frame and have trained thereover raising and lowering cables 143 which are attached to and reversely wound and unwound from a windlass 144 common thereto.

The windlass 144 is journaled at 145 midway of the longitudinal length of the frame of the machine and next to the front thereof. The axe 146 for the windlass 144 is operated by a hand crank 147 at the rear of the machine and this axe carries a ratchet pinion 148 with which cooperates a dog or pawl 149 pivoted at 150 at the top of the frame or machine. The cables 143 are attached to supporting arms 151 for the tracking board hereinafter referred to. These arms 151 are upon runners 81 hereinafore described.

In Figure 16 of the drawings there is shown a further modification of a resurfacing element mount, wherein the shaft 25 carries a disk 162 through which play in suitable openings near the periphery of the latter guide stems 153 fixed circularly to a backing plate 154 of a disk-like mount 155 for the resurfacing slabs or blocks (not shown). Interposed between the disk 152 and the plate 154 and centered with relation to the shaft 25 is a coiled cushioning spring 156 and in this manner the mount 155 is self-adjusting when the slabs or blocks are operating for resurfacing and polishing work. The stems 153 working in the disk 152 maintain these by nuts 157 of the mount 155 with the shaft 25 so that the latter will rotate said mount in the surfacing of the slabs or blocks.

What is claimed is:

1. A machine of the character described comprising a vertical frame having channeled tracks at opposite ends, runners having guide rollers fitting said tracks, forwardly projecting arms on said runners, a shiftable tracking board carried by said arms, a carriage moveable on said tracking board, rack and pinion connection between the board and said carriage, a motor carried by said carriage and operating said pinion, a surfacing element supported by the carriage and driven by said motor, and electrically operated means for reversing the travel of the carriage on the tracking board.

2. A machine of the character described comprising a vertical frame having channeled tracks at opposite ends, runners having guide rollers fitting said tracks, forwardly projecting arms on said runners, a shiftable tracking board carried by said arms, a carriage moveable on said tracking board, rack and pinion connection between the board and said carriage, a motor carried by said carriage and operating said pinion, a surfacing element supported by the carriage and driven by said motor, electrically operated means for reversing the travel of the carriage on the tracking board, and means for raising and lowering the runners in unison with each other.

3. A machine of the character described comprising a vertical frame having channeled tracks at opposite ends, runners having guide rollers fitting said tracks, forwardly projecting arms on said runners, a shiftable tracking board carried by said arms, a carriage moveable on said tracking board, rack and pinion connection between the board and said carriage, a motor carried by said carriage and operating said pinion, a surfacing element supported by the carriage and driven by said motor, electrically operated means for reversing the travel of the carriage on the tracking board, means for raising and lowering the runners in unison with each other, and means included with the said electric means and the last-named means for automatically effecting the lowering of the runners for changing the position of the surfacing element.

LOWELL STETLER.