March 22, 1932. K. A. WEBER 1,850,432

MACHINE FOR FINISHING EDGES OF STRIPS OF MATERIAL

Filed March 2, 1929 3 Sheets-Sheet 1

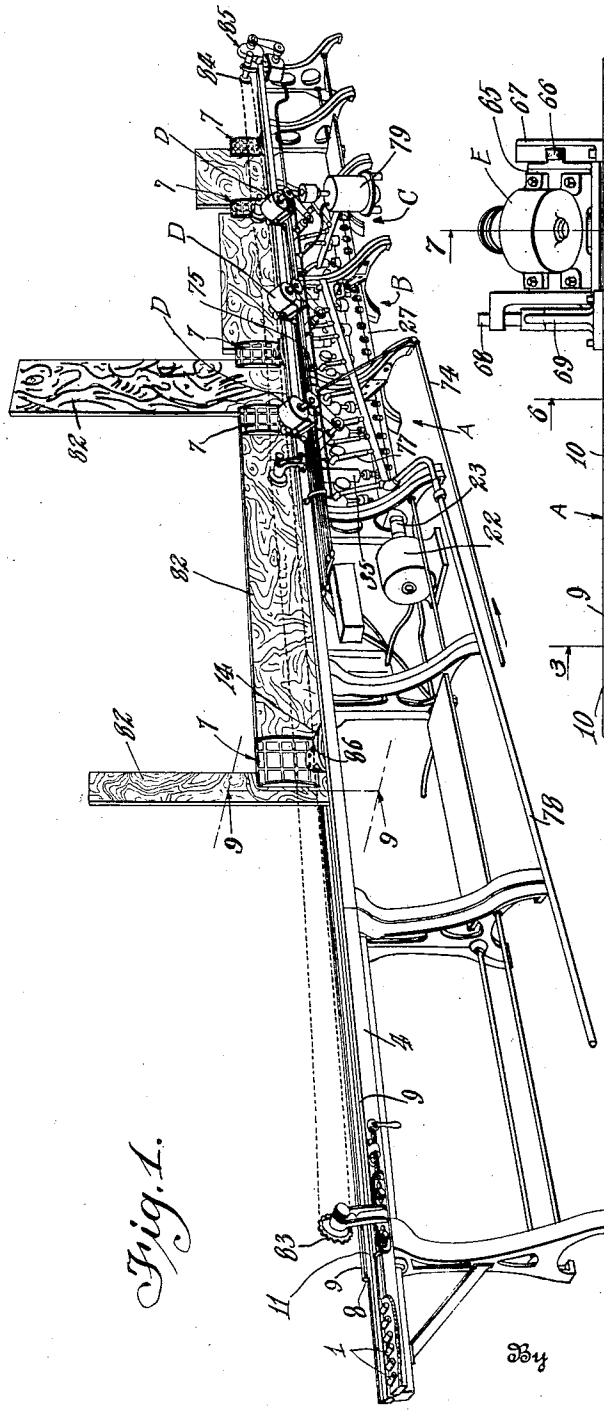


Fig. 1.

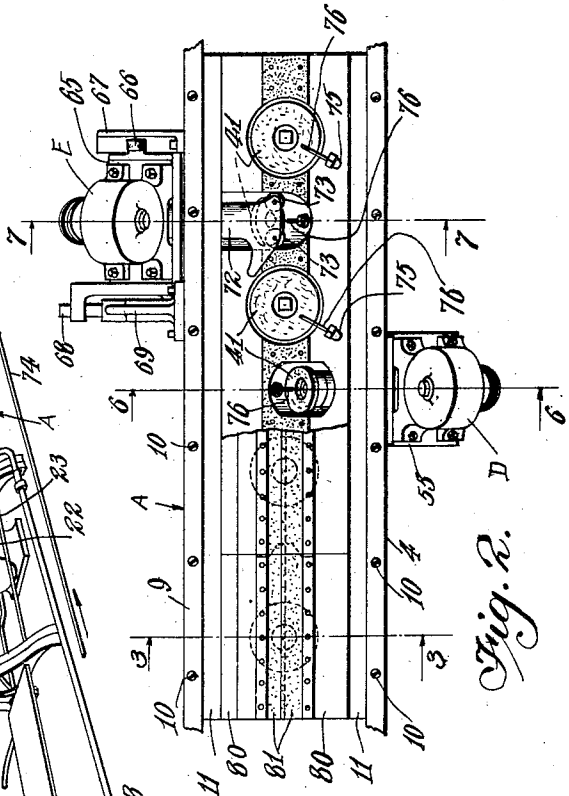


Fig. 2.

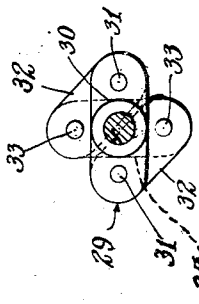


Fig. 4.

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MACHINE FOR FINISHING EDGES OF STRIPS OF MATERIAL

Filed March 2, 1929 3 Sheets-Sheet 2

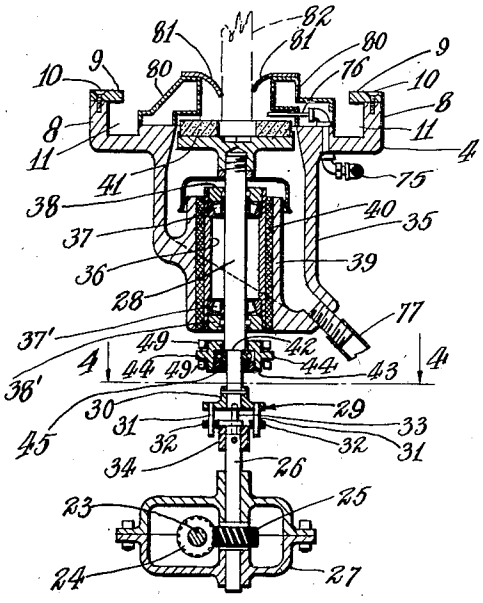


Fig. 3.

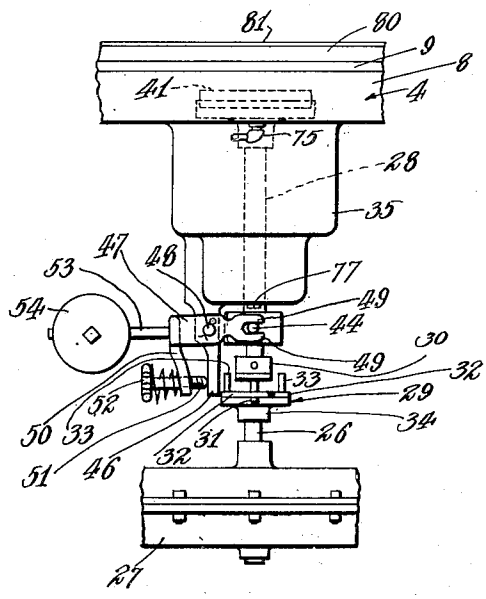


Fig. 5.

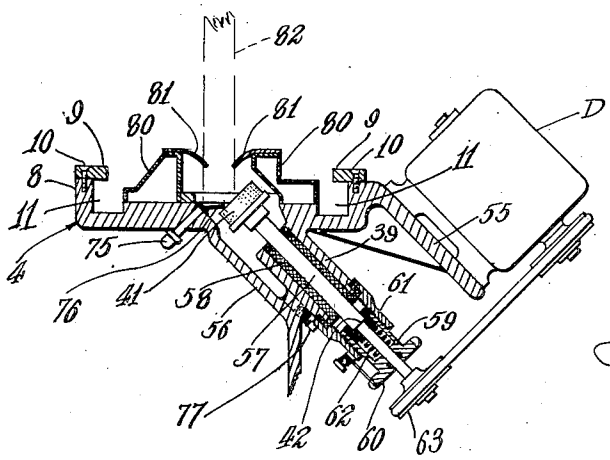


Fig. 6.

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MACHINE FOR FINISHING EDGES OF STRIPS OF MATERIAL

Filed March 2, 1929 3 Sheets-Sheet 3

Fig. 7.

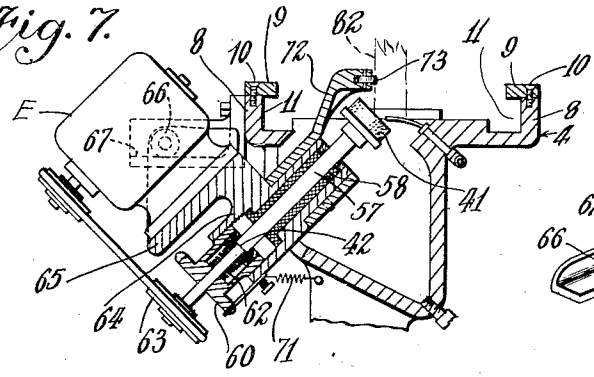


Fig. 8.

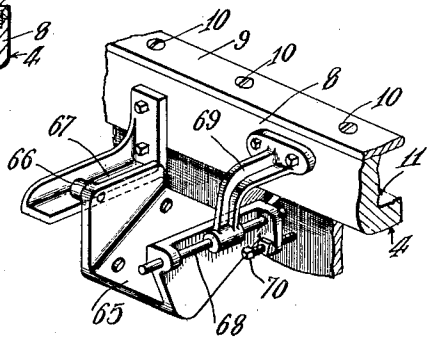


Fig. 9.

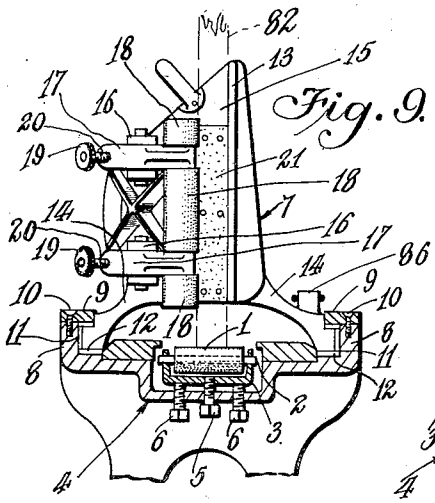
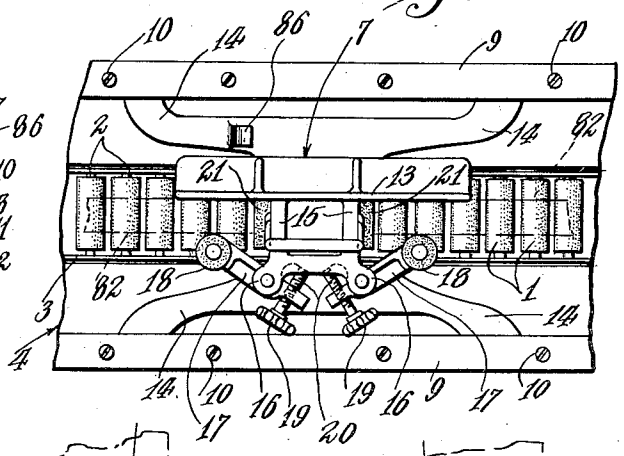


Fig. 10.



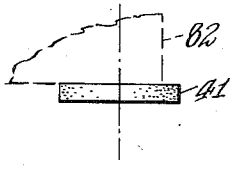


Fig. 11.

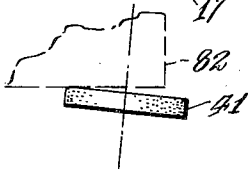


Fig. 12.

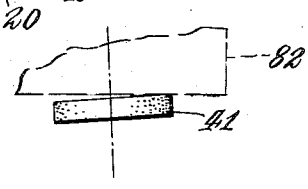


Fig. 13.

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UNITED STATES PATENT OFFICE

KARL ALBERT WEBER, OF LOS ANGELES, CALIFORNIA

MACHINE FOR FINISHING EDGES OF STRIPS OF MATERIAL

Application filed March 2, 1929. Serial No. 343,983.

This invention relates to the art of finishing edges and surfaces of strips and plates of material. The term "finishing" in this case, means grinding, polishing, straightening and/or beveling edges. By "strip of material" is meant, strip or sheets of any materials on which such operations may be carried out. Particularly, the machine and apparatus hereinafter described in detail, relates to the finishing of edges of glass, marble, ceramic compositions, or other substances in the form of plates, sheets or strips. For purposes of illustration, the description in detail of one form of machine and its operation and use will be limited to a machine particularly adapted for finishing the edge of strips of marble or the like, although, as has been stated hereinabove, other materials having the characteristics of marble, or adapted to be treated by a machine of the character described hereinafter, may be used instead of marble.

Great difficulty has been experienced in finishing surfaces of strip and sheet material particularly the surfaces of marble strips, plates, or sheets by means of grinding wheels or other abrasive or polishing wheels. Heretofore the only method of finishing edge surfaces of strips or plates of marble has been to pass a rubbing stone over the edges or edge surfaces manually by first clamping the strip or sheet of marble in a suitable vise. This method necessarily involves a great deal of labor, time and does not produce uniform flat true surfaces on edge surfaces of any great extent or length. It has been necessary to use this method, however, in view of the fact that a driven abrading means such as an abrading wheel or disc causes discoloration of marble by burning the marble and thereby rendering the marble adjoining the burned areas extremely brittle. For example, where it has been endeavored to pass marble plates over abrading wheels automatically, it has been found that the edges were discolored, chipped, cracked and otherwise disfigured so that such methods of finishing edge surfaces of marble plates had to be abandoned.

I have found that one of the reasons for these unsuccessful prior attempts to finish the surfaces of marble plates by means of automatic machinery has been caused by the weight of the marble pressing against the abrading means with such force that the abrading means burned, chipped and cracked the marble.

This is particularly true when large marble strips or plates are being treated. Furthermore, light or narrow and long strips of marble have not been treated or surfaced mechanically in the past as such strips, even though of light weight and incapable of exerting a sufficient force upon the abrading means to cause burning, could not be maintained in position so that an edge or other surface could be treated and finished to a true plane.

In addition, the movement of the strips of material while passing over the grinding elements, caused chipping of the edges to occur, thereby spoiling the strip or necessitating rerunning the strip a large number of times before a smooth edge, free from cracks or chips could be produced.

An object of this invention is to disclose and provide a machine adapted to finish surfaces and edges of strips and plates of material in an automatic and rapid manner.

Another object is to provide a machine capable of straightening and smoothing edges of strips of material without causing cracking or chipping to occur.

Another object of this invention is to disclose and provide means for passing strips and plates of material over grinding elements, and means for adjustably controlling the depth of cut and the pressure applied by the grinding elements upon such material.

An object of this invention is to disclose and provide means for controlling the grinding pressure of abrading means upon material of various weights passed thereover.

Another object of this invention is to disclose and provide means for passing a strip or plate of material over grinding elements, means for preventing lateral or vertical motion of said strips, and means for adjustably controlling the depth of cut and the pressure applied by the grinding elements upon edges of strips of material.

Other objects, advantages and uses of the machine embraced by this invention will be apparent to those skilled in the art from the following detailed description of one preferred form of said machine adapted to finish edge surfaces, it being understood that the invention is not limited to the concise structure shown therein, but includes numerous changes and modifications which may be made by those skilled in the art without departing from the spirit of this invention.

Although the machine described subsequently is particularly adapted to finish edge surfaces of strips and sheets of marble and the like, it will be understood that my invention is not limited thereto but may also be applied to and take the form of machines for treating and finishing other surfaces.

In describing the preferred form of the invention, reference will be made to the appended drawings, in which:

Figure 1 is a perspective view of the machine from the feeding end thereof.

Figure 2 is a plan view partly broken away of one section or unit of the abrading and polishing means forming a part of the completed machine shown in Figure 1.

Figure 3 is a vertical transverse section taken along line 3—3 of Figure 2, illustrating the details of construction of a single grinding or polishing element.

Figure 4 is a horizontal section taken along line —4— of Figure 3.

Figure 5 is a side elevation of the element shown in Figure 3.

Figure 6 is a vertical transverse section taken along line 6—6 of Figure 2, illustrating details of one form of beveling element of the machine.

Figure 7 is a vertical transverse section taken along line 7—7 of Figure 2, illustrating details of construction of an adjustable corner treating element of the machine.

Figure 8 is a perspective view of an adjustable support of carriage for the edge beveling element shown in Figure 7.

Figure 9 is an elevation partly in section taken along a vertical plane indicated by 9—9 on Figure 1 and showing clamping and conveying means.

Figure 10 is a plan view of a clamping and conveying means such as shown in Figure 9.

Figures 11, 12 and 13 diagrammatically illustrate the relative positions of the work and abrading, grinding and polishing elements which may be used.

The machine shown in the appended drawings may be made in sections and as shown in said drawings, may consist of three sections comprising the feed end, three sections A, B and C comprising the grinding and polishing units, and two sections (at the far end of the machine shown in Figure 1) comprising the discharge end. These sections are so connected as to form a continuous, straight line of feed for the material whose edges are to be treated.

The feed end and the discharge end sections of the machine may be formed with a line of support upon which (at the feed end) the strips or plates of marble and the like may be supported on edge in a substantially vertical position. This line of support may comprise a series of rollers 1 mounted upon pintles 2 rotatably mounted in a suitable frame, such as the channel iron 3, supported centrally of a depression in the main bed 4 of the machine. As shown in Figure 9, the rollers 1 mounted in the channel iron 3, are connected to the main frame 4 by means of tap bolts 5, the horizontal alignment of the rollers 1 in the channel iron 3 being maintained by manipulation of the tap bolts 6 passing through the frame or bed 4 and contacting with the channel iron 3. The rollers 1 and the pintles 2 are preferably loosely mounted in the channel iron 3 so that they may move transversely to the line of feed and in that way, prevent undue localized wear upon the rollers.

Longitudinally of the entire machine are formed guides adapted to slidably receive blocks carried by or attached to longitudinally movable clamping means 7, as shown in Figures 3, 6, 7 and 9. The bed or frame 4 may be provided with upstanding edge portions 8 and with removable inwardly extending top portions 9, said top portions 9 being connected to the frame 4 and particularly to the edges 8 by means of screws 10. This construction forms longitudinal grooves or guides 11 in which the blocks or shoes 12 carried by or connected to the clamping means 7, may be slidably received.

As shown in Figure 9, the clamping means 7 may comprise a vertical clamping face or clamping plate 13 provided with legs 14 terminating in the blocks or shoes 12, slidably received within the longitudinal grooves 11 on either side of the line of support. A lug 15 may extend from the central portion of the clamping face 13 and terminate in hinges 16, in which are vertically pivoted holding means 17. The holding means 17 may be provided with suitable resilient terminals 18 adapted to contact with the plates or strips of material held by the clamping means without scratching or marring the same. The holding means may also be provided with means for individually, adjustably locking the same in position, such means, for example, consisting of the hand wheels 19 attached to screws 20 mounted in threaded openings in the holding means 17, the ends of the screws 20 being adapted to rest against the lug 15 forming a part of the clamping means 7.

Blocks of resilient material 21 may be mounted upon the sides of the lug 15, so as to prevent injury to strips of marble and the like when the same is placed in the clamp-

ing means and the clamping face 13 may also be coated or covered with a resilient material to prevent marring or scratching. It will be seen that the clamping means hereinabove described is adapted to receive and firmly hold sheets or strips of material of varying thickness and in view of the fact that the clamping face 13 is in a vertical plane, the strip or sheet of material held therein will also assume a substantially vertical position.

Sections A and B of the machine may comprise the grinding and cutting sections, while section C may contain the polishing elements. It will be understood, of course, that the number of sections or the number of elements allotted to grinding or polishing may be materially changed without departing from this invention, the number of grinding and polishing elements to be used depending somewhat upon the speed with which the sheets or strips of material are passed through the machine and upon the character of the material being treated. Sections A, B and C are similar, however, in general construction, the only difference being the substitution of polishing elements for grinding elements or the use of grinding elements of varying degrees of fineness in these sections. Preferably, the first grinding elements to be used in finishing the edge of the material are of coarser texture than the subsequent grinding elements.

A plan view of a typical unit or section such as section A, for example, is shown in Figure 2, while vertical section through one of the grinding elements of such unit acting upon the edge of the strip of material is shown in Figure 3.

All of the grinding and polishing elements positioned in the line of feed and acting upon the edge of the material are preferably driven by means of a single motor 22 connected by suitable means to a longitudinal drive shaft 23 (Figure 3) (journaled in a longitudinal housing 27, extending under each section) bearing a plurality of spiral gears 24, each mounted in operable contact with a spiral gear 25 mounted upon a vertical shaft 26. Each shaft 26 is operably connected with a drive shaft 28 by means of an extensible clutch 29. The form of clutch or coupling shown embraces the following construction: The lower terminal of the shaft 28 may have mounted thereon a spider 30 provided with downwardly extending pins 31, passing through apertures in links 32 pivotally mounted as at 33 to a spider 34 carried by the upper end of the driven shaft 26.

The driven shaft 28 may be mounted within a suitable housing 35 connected to or made a part of the bed or frame 4. The shaft 28 may be mounted in the housing 35 in the following manner:

A sleeve 36 containing bearings 37 and 37′ near its ends and provided with plugs 38 and 38′, may be slipped upon the shaft 28 and then introduced into a cylindrical casting forming the lower and central portion of the housing 35, as indicated at 39. The sleeve 36 may fit loosely into the cylindrical casting 39 and after said sleeve is properly positioned within the casting 39, babbitt or other suitable metal 40 is poured into place into the annular opening between said sleeve 36 and the walls of the cylindrical casting 39, so as to fill said opening and securely mount the cylinder or sleeve 36 within the housing. In this way, the shafts 28 may be mounted within the housing 35 and the axis of said shafts 28 may be caused to assume a perfectly vertical position or be caused to be slightly inclined in a plane passing through the line of feed, thereby causing the grinding element or polishing wheel 41 mounted upon the upper end of the shaft 28, to assume a position permitting either the forward edge of the grinding element 41 to contact first with the strip of material whose edge is to be treated, as shown in Figure 12 or so as to cause the rear edge of grinding element 41 to contact with said strip of material, as shown in Figure 13. Or, it may be desired that the grinding element 41 present a perfectly flat, horizontal face to the material whose edge is being finished as shown in Figure 11 and any or all of these positions may be assumed by the grinding element and retained thereby by mounting the same as hereinabove described.

It will be noticed that the shaft 28, together with the abrading or polishing element 41 mounted upon its upper end, is movable in a vertical plane, for a distance equivalent to the distance which separates the lower end of shaft 28 and the upper end of shaft 26, operable connection being maintained between said shafts by the loose coupling 29 and particularly by the pins 31 carried by the spider 30. The grinding or polishing element 41 may be maintained in a plane substantially equivalent to the line of support established by the rollers 1, or may be adjusted relative to said line of support and the grinding pressure regulated by the following means:

The shaft 28 may be reduced in diameter at its lower end so as to form a shoulder 42 and a small collar 43, provided with lugs 44, loosely journaled upon the shaft 28 adjoining shoulder 42 made therein. A bearing may then be positioned within the collar 43 and retained therein by means of a plug 45. In other words, the shaft 28 is rotatable within the collar 43 and vertical motion of the collar 43 imparts a vertical motion to the shaft 28 without interfering with its rotation, said shaft 28 being supported during rotation upon the bearing within the collar 43.

Externally and downwardly depending from the housing 35 is a lug 46 bearing a

yoke 47 pivoted thereon, as at 48. The yoke 47 is provided with fingers 49 adapted to engage the pins 44 extending from the collar 43. The opposite end of the yoke 47 may be provided with a downwardly extending lug 50 through which is passed a threaded shaft 51 provided with a hand wheel 52, the opposite end of the threaded shaft 51 being adapted to rest against the lug 46. Connected to the yoke 47 is an outwardly extending bar 53 provided with a weight 54 movably positioned thereon.

The weight 54 causes the yoke 47 and fingers 49 to raise the collar 43, thereby causing the shaft 48 to be raised to any predetermined position, said position being regulatable by the adjusting screw 51. By moving the weight 54 upon the bar 53, the weight of the shaft 28 and grinding element 41 carried thereby may be so balanced that a relatively slight pressure upon the working surfaces of the grinding or polishing element 41 is sufficient to depress the shaft 28, or by further adjustment of the weight 54, any desired pressure of grinding element upon the edge of material being finished may be obtained, The principle and advantages of this construction will be described later.

In the form of machine being described herein, the edges of the strips or sheets of material being treated are finished by means of the grinding and polishing elements rotating in a horizontal plane or in a plane parallel or substantially parallel to the plane of the edge being finished. On certain materials, this finishing action produces an extremely sharp corner where the edge or side and face of the material meet. In order to give the strips a finished appearance, it is often desirable to employ grinding or polishing elements so positioned as to cut a very small bevel from the edges of the material. This may be accomplished by placing grinding or polishing elements in the line of feed at angles of about 45° to the line of support and to the grinding elements operating upon the edge of the material. In the machine illustrated in the drawings, three grinding and polishing elements are positioned on the right hand side, driven by individual motors D. The elements driven by the motors D are shown in Figures 2 and 6.

Referring to Figure 6, the motor D may be rigidly mounted upon an outwardly extending support 55 connected to or made a part of the bed or frame 4, and immediately above a housing 56 extending downwardly from the main bed or frame 4. The housing 56 may be provided at its lower and outer end with a cylindrical casting 39 in which a shaft 57 is rotatably mounted. The exact angle of the shaft 57 may be controlled by first pouring in babbitt or other metal 58 into the cylindrical aperture 39 and then reaming out opening for the shaft 57 at the proper angle and inclination.

The lower end of the shaft 57 is also provided with a shoulder 42 such as has been described hereinabove, resting upon bearings retained with a gland 59 provided with an adjusting nut 60. The gland 59 is threaded into collar 61 connected to the housing 39 by any suitable means, such as tap bolts or screws. The bearing upon which the shoulder 42 of the shaft 57 rests may be urged upwardly by means of a spring 62 within the gland 59, so that the shaft 57, together with the abrading or polishing element 41 attached at its upper end, may move downwardly and away from the work, if such work exerts a pressure sufficient to counterbalance the spring 62. By manipulating the adjusting nut 60 provided with a suitable lock, such as a spring means engaging notches in the adjusting nut 60, the shaft 57 may be caused to assume higher or lower positions with respect to the line of support and thereby cause the abrading or polishing wheel 41 to exert a larger or smaller pressure upon the work. The lower end of shaft 57 may be provided with a pulley 63 driven by means of a belt from the motor D.

Attention is called to the fact that work placed in the machine is carried therethrough by the clamping means 7 which is provided with a laterally immovable vertical clamping face 13. In other words, that edge of the material being finished adjacent to the clamping face 13 travels in a line of feed which is definite with respect to the frame or bed of the machine. Variation in the thickness of the strips or sheets of material being finished causes the position of the opposite edge of the material being finished to vary somewhat with respect to the size of the bed or frame and with respect to the longitudinal center line passing through the various shafts 28 of the grinding elements.

In order to take care of this variation of the left hand edge position of the material being treated, a series of adjustable corner treating abrading and polishing means are positioned on the far side of the machine shown in Figure 1. These corner treating or beveling elements, illustrated in Figure 7, may be driven by individual motors E. The shafts 57, of these units are positioned in housings 64 in much the same manner that has been described hereinabove and illustrated in Figure 6. The housing 64, however, is provided with an extension 65 which forms part of a carriage, movable in a substantially horizontal plane. The motors E are attached to the carriage 65 and are movable, therefore, with the housing 64; whereas, the corner finishing abrading and polishing wheels illustrated in Figure 6, are driven by motors D, immovable with respect to the housing 56.

Although two types of corner treating ma-

chines are illustrated, either type may be used on both sides of the machine, the arrangement herein given having certain advantages however.

The carriage 65 may be provided with rollers 66 adapted to run along a track formed by an extension 67 connected to the bed or frame of the machine. The carriage 65 may also be provided with a shaft 68 passing through a hanger 69 attached to the bed or frame of the machine, said carriage being provided with an adjusting screw 70 passing through a lug in the carriage and contacting with the frame or other suitable portion of the machine, so as to limit the travel of the carriage 65 on the track 67 or in the hanger 69, toward the line of travel or line of support. Suitable means such as the spring means 71 may be provided for consistently urging the carriage 65 together with the housing 64 and shaft 57 contained therein, toward the center or towards the line of travel of the strips or sheets being finished.

The housing 64 may also be adjustably connected to the guard arm 72 extending above the line of support and provided with rollers 73 adapted to engage with the side of strip or sheet material being finished. If a strip or sheet of material of unusually large width comes in contact with the guard 72, said guard moves the entire carriage 65 away from the line of feed, thereby preventing the corner of the edge of material to be finished from engaging the cutting or abrading wheel at a greater depth of cut than is desired.

Means may be provided for supplying a suitable liquid or an abrasive suspension to the various grinding and polishing elements. For example, a liquid may be supplied through a line 74 to all of the grinding elements through branch lines 75 terminating in nozzles 76 directed onto the grinding elements 41. The waste liquid drains from the grinding element and is collected in the housings 35 which are preferably provided with slanting bottoms provided with drains 77 communicating with a common outlet 78.

The polishing elements, made of cork or any other suitable material, may be supplied with a polishing material in the form of a suspension, and in order to use such polishing material with greatest economy, the drains from such polishing units may lead to a suitable storage receptacle, filter, clarifier, or the like 79, from which the used and cleaned or purified solution or suspension of polishing material may be returned to the spray nozzles supplying said solution or polishing material to the polishing elements. The specific construction of the cleaning means 79 is not being described, as the construction of such means per se is known.

Paralleling the line of travel through the grinding, abrading and polishing sections of the machine, guards 80 may be provided extending somewhat over the grinding elements 41, as shown in Figures 2, 3 and 6. Flexible members 81 may be connected to the upper portion of the guards 80, said sections 81 coming together or overlapping in a longitudinal line, approximately centrally of the line of travel, as shown in Figure 2. In this manner, the grinding elements 41 are housed and spattering of liquid and polishing material is prevented without interfering with the introduction of strips, sheets or panels 82 of marble or the like, the strips 81 bending out of the way of the panels or strips 82 and pressing against the sides of the strips without retarding their progress through the machine. The close contact of the flexible strips 81 with the strips of marble 82 prevents spattering or loss of polishing material when the machine is in operation.

The operation of the machine, in view of the above description, will be very easily understood. Strips or plates of marble 82 are placed upon the line of support made by the rollers 1, such strips or plates resting upon their edges in a substantially vertical position.

The vertical edges of the strips or slabs 82 are then rigidly clamped in the clamping means 7, and said clamping means are then moved longitudinally of the machine, carrying the strips of material in the line of feed by operation of a continuous chain mounted on sprockets 83 and 84, at each end of the machine, one of said sprockets being driven by any suitable means, such as the motor and gearing indicated at 85. The chain is preferably provided with dogs which engage lugs or other suitable points of contact 86 formed in the legs 14 of the various clamping means 7, as indicated at Figures 9 and 10. In this manner, a strip of marble or other similar material, is passed over the various grinding, abrading and polishing elements, the strip of marble or the like being maintained in a perfectly vertical position and substantially immovable vertically or laterally. If desired, both the front and rear ends of a long strip of material whose edge is to be finished may be firmly held by the clamping means 7.

The depth of cut which it is desired to take from the edge of the material being finished, is regulated by the means hereinabove described, such means for example, comprising the screw 51 and hand wheel 52. The pressure or force exerted by the grinding elements against the material whose edge is being finished may be regulated, as hereinabove described, by manipulation of the weight 54 upon the bar 53.

The particular construction described hereinabove prevents the first few grinding elements from being overloaded. If, for example, a strip of marble is fed through the machine, said strip having a very rough broken

edge, the first few grinding elements may be so adjusted that they will merely grind off the major protuberances on the edge of the material being finished, and will give way when an extremely large protuberance is encountered, thereby preventing the abrading wheel from exerting a sufficient amount of force upon the material being finished, to crack the same or splinter it, because of the great depth of cut which it is required to make.

When the strips or sheets of marble or the like have reached the discharge end of the machine, the hold of the clamping means 71 upon the strips is released and the strips removed. The clamping means 7 may then be pulled out of their grooves 11 at the discharge end of the machine and carried back to the feed end, where they are again introduced into the grooves, although an endless conveyor for such clamping means could be provided.

It will be understood that by means of the above described machines and the modifications embraced by this invention, strips and plates of various materials may have their edges finished in a rapid, continuous and automatic manner, the difference in weight between large and small pieces being treated not interfering with the efficiency of the operation.

For example a large marble plate weighing 400 pounds may be followed by a strip of marble weighing 50 pounds without necessitating a readjustment of the machine, the apparatus hereinabove provided regulating the grinding pressure upon the surfaces being treated and yielding beneath the heavier plate so as to prevent burning, discoloration or chipping of the material being finished or the abrading means itself. As a matter of fact the clamping means hereinabove described need not be employed for the purpose of maintaining the marble or other plates or strips from vertical motion but said clamping means may merely take the form of means adapted to guide and push the material being treated over the yielding abrading means.

The pressure at which the abrading means may yield beneath the material being treated will vary necessarily with the character of the material being treated. For example, marble plates and strips may be passed through a machine having its abrading means so adjusted as to yield at a pressure of about 14 pounds while strips and plates of granite or other stones may require a different pressure. The speed at which the conveying means or the clamping means move the material being treated over the abrading means will also influence the yielding pressure and the grinding pressure which may be exerted by the abrading means upon the material. Marble plates may be worked at grinding pressures of about 10 to 30 pounds depending upon the character of the marble and the speed of feed, about 14 pounds being sufficient at normal speeds.

The details relating to the wiring, switches and the like are not being given hereinabove, as such data are available to those skilled in the art. The essential features of the machine have been described in detail, however, and although the particular form of machine and a particular construction is shown herein, the invention is not limited thereto, but includes all such modifications and changes as come within the scope of the invention claimed herein.

I claim:

1. In a machine for finishing edges of strips of marble of different widths, the combination of a line of supporting means upon which strips of marble may be supported on edge, means for moving strips of marble longitudinally along said line of supporting means, said means including means for substantially holding said strips against lateral and vertical movement, corner treating means movable in the plane of the lower edge of marble being treated, and means actuated by variation in thickness of marble being treated for automatically positioning said corner treating means with respect to the corners of said lower edge of marble, whereby uniform corner treating action may be obtained.

2. In a machine for finishing edges of strips of marble of different widths, the combination of a line of supporting means upon which strips of marble may be supported on edge, means for moving strips of marble longitudinally along said line of support, said means including means for substantially holding said strips against lateral and vertical movement, and corner treating means angularly positioned with respect to the plane of the lower edge of marble being treated and movable in the plane of the lower edge of material being treated, and means actuated by variation in thickness of said marble being treated for automatically positioning said corner treating means with respect to the corners of said lower edge of marble, whereby uniform corner treating action may be obtained.

3. A finishing machine for strips and sheets of marble of different thickness and size, comprising a bed frame, supporting means adapted to support sheet and strip marble on edge carried by said bed frame, corner treating abrading means carried by said bed frame, said corner treating abrading means being movable in the plane of said supporting means and transversely thereof, and means carried by said corner treating abrading means adapted to contact with sheet and strip marble on said supporting means and adjustably position said abrading means with changes in thickness of said sheet and

strip marble, whereby a uniform corner treating action may be obtained.

4. In a machine for finishing the edges of strips of marble of different widths, the combination of a bed frame, supporting means carried by the bed frame and adapted to support sheet and strip marble on edge, means for moving strips and sheets of marble along the bed frame in a line of feed, said moving means including means for substantially holding said strips against lateral and vertical movement, driven abrading means mounted angularly with respect to said supporting means and adapted to treat corners of sheet and strip marble moving along said line of feed, said corner treating abrading means being mounted upon a carriage movable transversely of said line of feed, and means carried by said carriage and adapted to contact with sheet and strip marble moving along said line of feed and to adjustably position said abrading means with changes in thickness of said strip and sheet marble, whereby uniform corner treating action may be obtained.

5. In a machine for finishing the edges of strips of marble of different widths, the combination of a bed frame, means for moving strips and sheets of marble along the bed frame in a line of feed, driven abrading means adapted to treat corners of sheets and strips of marble moving along said line of feed, said corner treating abrading means being mounted upon a carriage movable transversely of said line of feed, and means carried by said carriage and adapted to contact with sheet and strip marble moving along said line of feed and to adjustably position said abraiding means with changes in thickness of said sheet and strip marble, whereby a uniform corner treating action may be obtained.

Signed at Los Angeles, California, this 21st day of February, 1929.

KARL ALBERT WEBER.