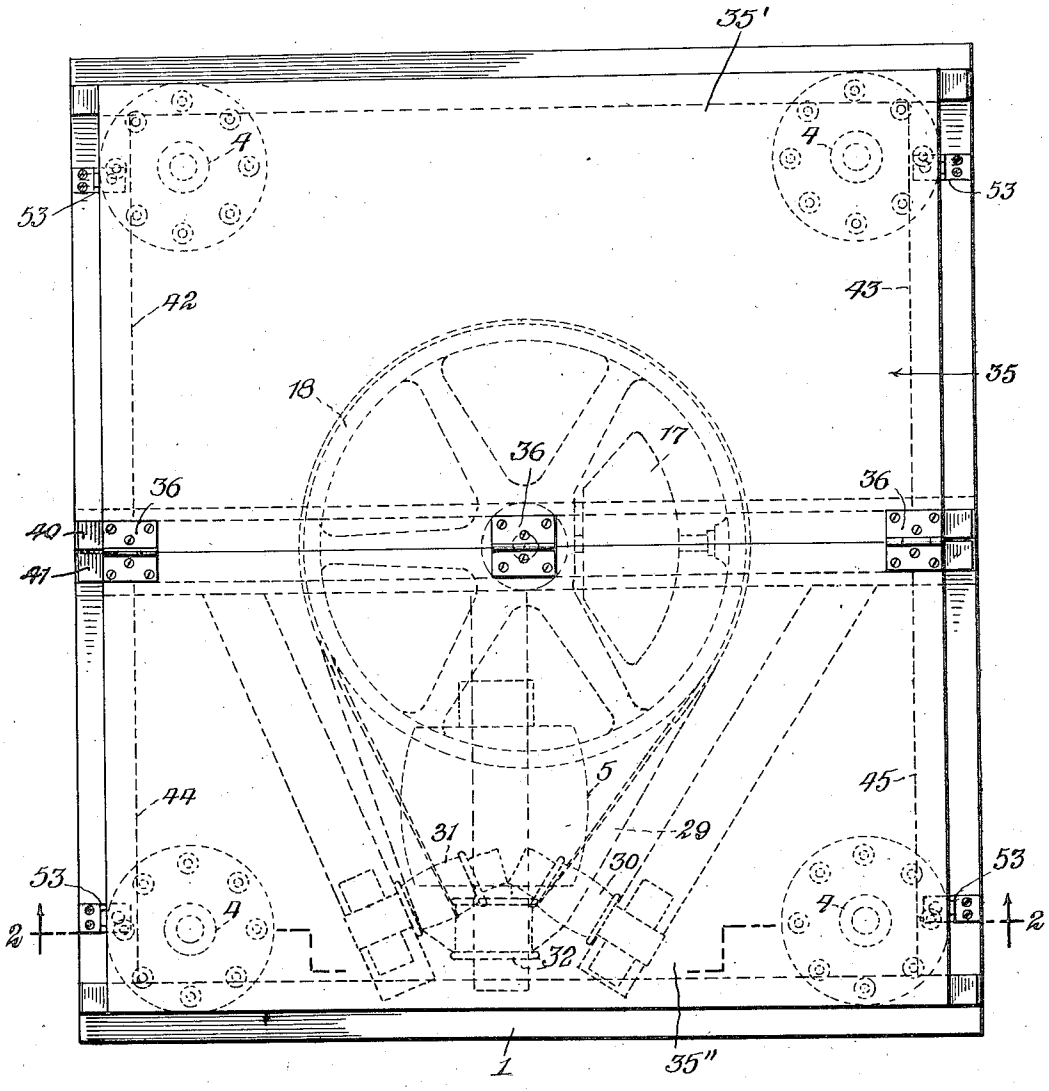
April 21, 1936. R. FRITSCHE 2,038,352

LITHOGRAPHIC PLATE GRAINING MACHINE

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Fig. 1.



WITNESSES

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Fig. 2.

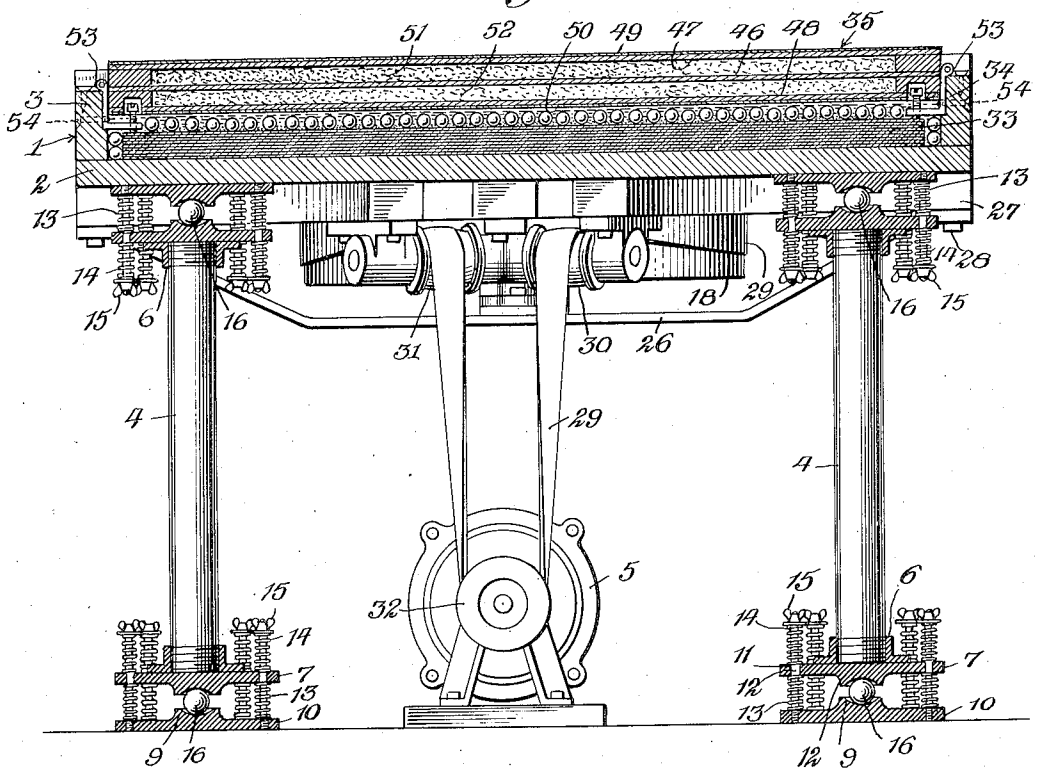


Fig. 3.

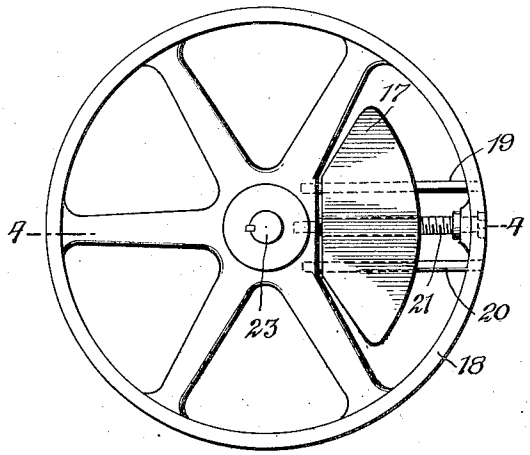
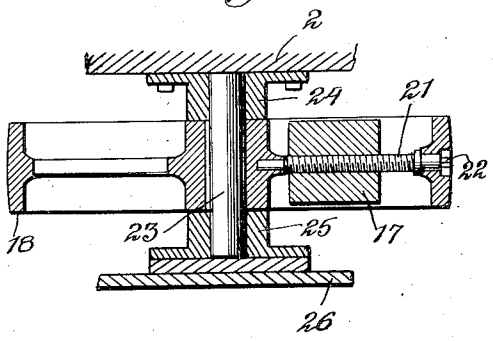


Fig. 4.



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LITHOGRAPHIC PLATE GRAINING MACHINE

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7 Claims. (Cl. 51—6)

This invention relates to graining plates for lithographing use, an object being to provide a construction wherein the plate may be grained comparatively quickly and with comparatively little noise.

Another object of the invention is to provide a graining machine for lithographic plates wherein means are provided for producing a graining action whereby a very fine grain is secured or a coarser grain according to the way the parts are actuated.

A further object more specifically is to provide a graining machine wherein the tank or box is given a gyratory movement through a power driven means and through the use of spring-held supporting standards.

An additional object of the invention is to provide a graining machine wherein there is a gyrating box for receiving the plates to be ground, and a cover for the box formed to substantially eliminate the noise created during the graining operation.

In the accompanying drawings—

Figure 1 is a top plan view of a graining machine disclosing an embodiment of the invention;

Fig. 2 is a section view through Fig. 1 on approximately the line 2—2;

Fig. 3 is a bottom plan view of a pulley wheel and counterweight disclosing certain features of the invention;

Fig. 4 is a sectional view through Fig. 3, approximately on the line 4—4.

Referring to the accompanying drawings by numerals, 1 indicates a tank or box which has a bottom 2 and suitable side members 3. This tank or box is supported by any desired number of standards 4, there being preferably four, as indicated in dotted lines in Fig. 1. These standards are preferably arranged at the extreme outer portions of the corners of the box and act to normally support the box in such a way that the standards will be vertical, but when electric motor or other prime mover is functioning and also the other parts are functioning the standards will swing back and forth in an oscillating way to permit a gyration of the box 1. As the respective standards 4 are identical and the associated parts also are identical, a description of one will apply to all.

As illustrated particularly to Fig. 2, the standard 4 is connected by a suitable socket fitting 6 to a plate 7. The socket fitting 6 may be welded or otherwise secured to plate 7, which plate has an inverted cup 8 arranged opposite the cup 9 of a plate 10. There are provided any desired number of rods 11 having the lower end screwed into plate 10, said rods extending loosely through suitable apertures 12 in plate 7. There are provided for each rod 11, a spring 13 between plates 7 and 10, and a spring 14 above plate 7, spring 14 being normally held under tension by a nut 15. As a matter of fact, both of the springs of each rod are held under tension by the respective nuts 15, and this tension is wholly sufficient to hold the standard 4 upright when the device is not operating. As indicated in dotted lines in Fig. 1, there are eight rods 11 but a greater or less number could be used without departing from the invention. It will also be noted that a thrust ball or bearing 16 is accommodated in the cups 8 and 9. Both ends of each standard 4 are formed with the structure just described so that it is thought no further description is needed for the upper part of the rods as the upper and lower ends are identical, each having a thrust ball 16, plates 7 and 10, and rods and springs as just described. In case the oscillation or gyration of the box 1 should be too great, the same may be varied in different manners, as, for instance, by shifting a counterweight 17, hereinafter fully described, or by varying the tension of the springs 13 and 14.

Arranged beneath the tank or box 1, is a large pulley wheel 18, carrying the counterweight. From Figs. 3 and 4 it will be observed that the counterweight 17 is slidingly mounted on rods 19 and 20, and has a threaded member 21 threaded therein, said threaded member being mounted in the respective parts of the pulley wheel 18, as shown in Fig. 4. The counterweight 17, as far as the threaded member 21 is concerned, acts as a traveling nut so that when the threaded member 21 is operated by an instrument engaging the head 22, the counterweight will be moved radially inwardly or outwardly in respect to the wheel 18. The pulley wheel 18 has a shaft 23 keyed or otherwise rigidly secured thereto, one end of the shaft being loosely journaled in a socket 24 welded or otherwise secured to the bottom 2 of the tank 1. The lower end of the shaft 23 is loosely mounted in a socket 25, said socket being mounted on one or more cross bars 26, said cross bars at the ends being secured by bolts or otherwise to the bottom of the box 1.

It will be noted that the bottom of the box 1 has one or more beams 27 connected to the bottom 1 and the member 26 is secured by bolts or screws 28 thereto. The detail construction of the bottom part of the box 1 may be varied without departing from the spirit of the invention so that

one or more beams **27** may be provided in order to stiffen or brace the box.

A belt **29** is adapted to fit around the wheel **18** and then pass over guiding pulleys **30** and **31** to guide the belt so that it will then pass over the driving pulley **32**, which driving pulley is rigidly secured to the rotating part of the prime mover **5**. It will, therefore, be observed that when the prime mover **5** is moving the belt **29**, the pulley wheel **18** will be rotated and will naturally move the counterweight **17**. This counterweight will move comparatively fast and will, in a certain sense, throw or urge the parts by reason of centrifugal action so as to give an oscillating, or rather gyrating, movement to the box **1**. This gyrating movement may be increased in amplitude or decreased by moving the counterweight **17** inwardly or outwardly with respect to the pulley wheel **18**. When the counterweight **17** is at its outermost point, there will be the greatest movement or gyration of box **1**. This usually results in providing coarser graining, as well as faster graining. By moving the counterweight **17** inwardly, the gyration is reduced in amplitude and the graining becomes finer and finer.

In using a graining machine of the type just described, or any type which is now in common use, there is usually placed in the box a number of plates **33** to be grained. These plates are stacked and extend almost from one end to the other of the box, and also from one side to the other. Water is placed in the box until these plates are wholly submerged and a thin layer of sand is placed on top of the uppermost plate, and finally the various balls **34** are placed substantially as shown in Fig. 2. The balls are usually less than half submerged, while the sand is usually completely submerged in water. These balls may be ordinary marbles, steel balls, or any other small round objects having some appreciable weight. During the gyration of the device these balls will naturally move and cause the sand to produce the desired graining action in the presence of water.

During this movement noise is produced which is more or less objectionable. To obviate this noise there has been provided a cover **35**, which cover is preferably divided into two parts, as shown in Fig. 1, said parts being connected together by hinges **36**. These parts are formed identical and when in position snugly fit the box **1**, but may be readily removed therefrom completely, or only one part may be swung out of the way when temporary access is desired to the interior of the box. As illustrated, there are provided transverse bars of wood or other desired material, **38**, **39**, **40** and **41**, said bars overlapping the side edges of the box **1**. In addition, connecting bars **42** and **43** are provided for the part or section **35'**, while connecting bars **44** and **45** are provided for the part or section **35''**. This framework just described is preferably formed from wood, and arranged between the upper and lower parts of this framework is positioned for each of the sections **35'** and **35''**, a plate **46**, which may be of beaver board or similar material, and arranged at the top and bottom of the respective parts of the cover are similar beaver board cover plates **47** and **48**, which, in turn, are preferably covered with thin metal sheets **49** and **50**. This leaves a space which is preferably filled with some sort of waste **51** and **52**, said waste being wool, cotton, or other material whereby a substantially sound-proof structure is presented.

When the parts are in the position shown in Fig. 2 the machine is ready for use, and after the machine has run for a certain length of time, as, for instance, a half hour more or less, the top plate of the pile of plates **33** will have been properly grained. The entire cover **35** may then be removed, or, if desired, only one part, as, for instance, section **35''**, may be swung back over the other part and then the uppermost plate slid out. This will allow the balls and sand to drop down onto the next lower plate. After the second plate has been grained, it is removed in a like manner until all the plates have been grained. If desired, water may be added from time to time, or removed from time to time, and also sand may be added or removed as desired.

The cover **35** is adapted to fit rather snugly the side walls **3** of the box **1**, so as to prevent the escape of sound from inside the box.

Preferably at each corner of the tank there is arranged a clamping member **53**, each of which members is provided with a set screw and a hinged connection with the side walls **3**. These clamping members are designed to hold the various plates **33** against shifting when the device is operating. After the top plate has been grained these clamping members must be swung out of the way before the top plate can be removed, and then they are swung back and the set screw again caused to function.

I claim:

1. A graining machine of the character described, comprising a box adapted to receive plates to be grained, means for moving said box so that a graining action may take place, and a substantially sound-proof cover for said box formed with a portion fitting within the box and with extending members resting on top of the box.

2. A graining machine, including a box, a plurality of supports for said box, said supports being swingable in all directions, and means for moving said box to give a gyratory motion thereto.

3. A graining machine, including a box, a plurality of supports therefor, a plurality of springs connecting said box with said supports whereby the springs will act to normally tend to hold the box in a position for holding the supports vertically, said springs acting to return the supports to a vertical position when moved therefrom, and a power-driven counterweighted wheel connected with the box for giving the box a gyratory movement.

4. In a graining machine of the character described, a box, and a plurality of supports therefor, each of said supports comprising a standard, a bearing member at each end of the standard, a plate secured to said standard at each end thereof, a plurality of rods fixed at one end, and extending loosely through each of said plates, and a spring on each side of each of said plates surrounding the respective rods and acting to hold said supports in a substantially vertical position but permitting a movement from the vertical position.

5. In a graining machine of the character described, a box, and a plurality of supports therefor, each of said supports having at each end a fixed plate, a bolt mounted on said fixed plate, a second plate rigidly secured to the support and spaced from the fixed plate, said second plate having a plurality of apertures adjacent the periphery, a rod extending loosely through each of

said apertures, each of said rods being at one end screwed into said fixed plate, an adjusting nut at the opposite end of each of said rods, and a plurality of coil springs surrounding each of said rods, there being a coil spring on each side of said second plate and acting on said second plate to normally hold the same substantially parallel with the fixed plate, said nuts acting to vary the tension of said springs so as to resist movement of the support from the vertical and to return the supports to a vertical position when permitted.

6. A graining machine of the character described, including a box adapted to receive the material to be grained, swingable supports for said box, a wheel rotatably mounted on the lower part of said box, a counterweight radially movably mounted on said wheel, means for locking said counterweight at different distances from the center of said wheel, and a driving belt engaging said wheel for rotating the same.

7. A graining machine of the character described, including a box, a pulley arranged on the under surface of the box, a journal pin for said pulley carried by said box, means for driving said pulley, and a counterbalancing structure for said pulley, said counterbalancing structure including a weight movable radially with respect to the center of the pulley, and means for moving and holding in different positions said weight, whereby the action of the pulley in gyrating said box will be varied.

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