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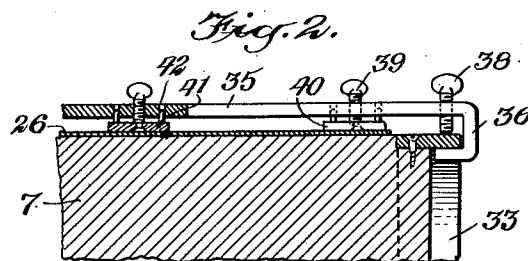
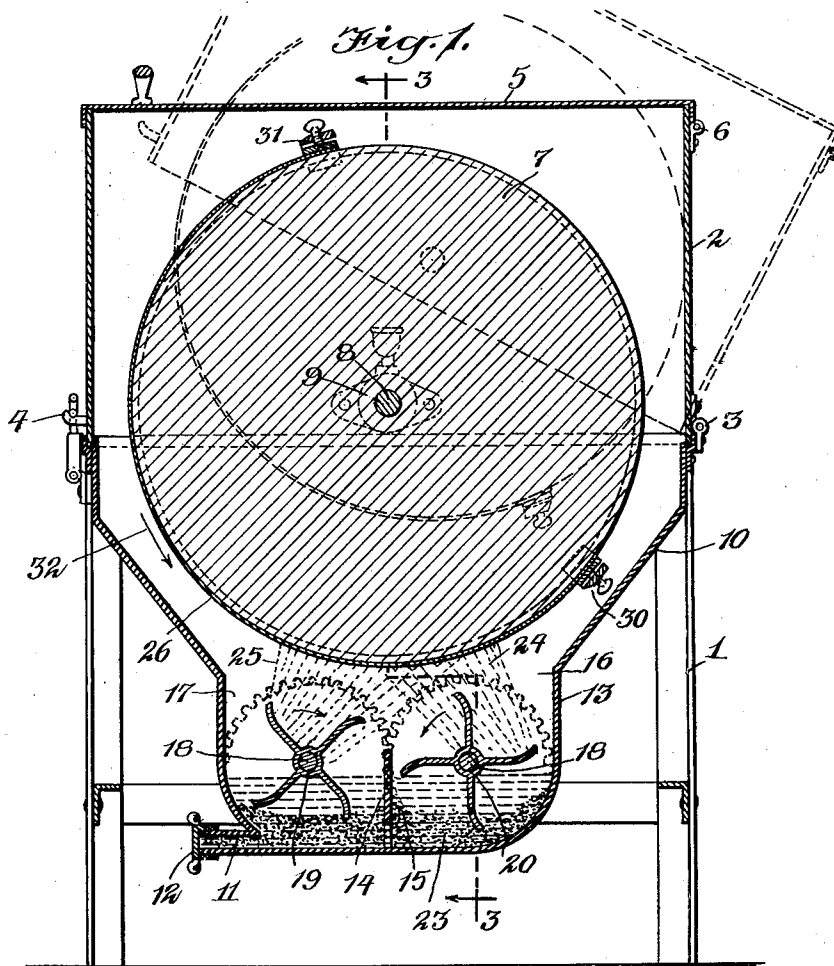
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2,005,654

LITHOGRAPHIC PLATE GRAINING DEVICE

Filed Jan. 9, 1934

2 Sheets-Sheet 1



WITNESSES

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2 Sheets-Sheet 2

Fig. 3.

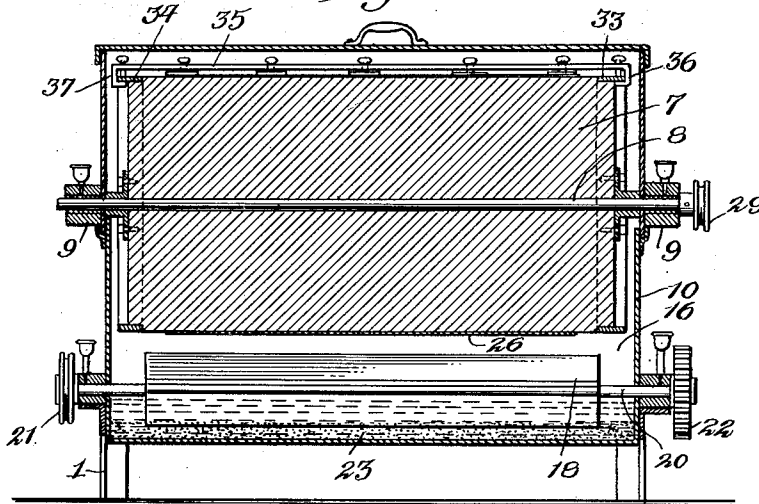


Fig. 4.

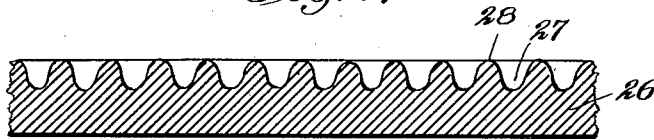
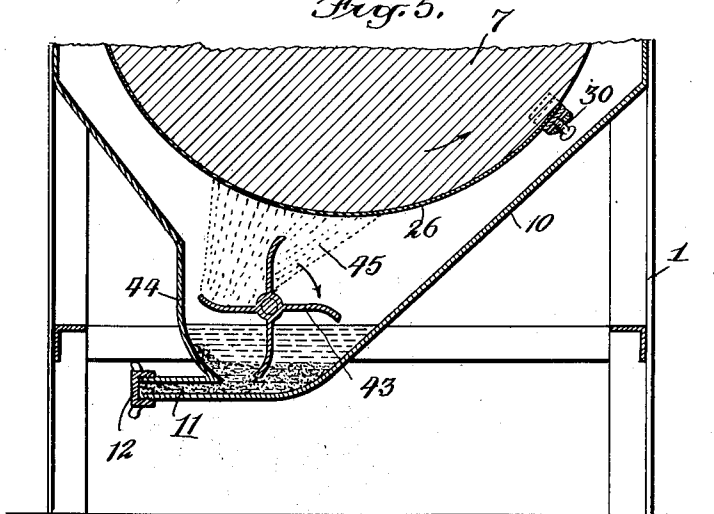


Fig. 5.



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LITHOGRAPHIC PLATE GRAINING DEVICE

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2 Claims. (Cl. 51—9)

This invention relates to lithographic plate graining and has for an object to provide a construction wherein a plate may be grained in a minimum time.

5 Another object of the invention is to provide a device for graining lithographic plates wherein the graining is uniform and deeper than now in common use.

10 An additional object is to provide a graining machine for graining lithographic plates wherein the graining is formed with rounded depressions and smooth protuberances instead of the hooked form as now in common use.

15 A still further object, more specifically, is to provide a graining machine for graining lithographic plates wherein sand and water is thrown against the plate by one or more agitating and impelling blades while the plate is moving.

In the accompanying drawings—

20 Figure 1 is a longitudinal vertical sectional view through a graining machine disclosing an embodiment of the invention;

25 Figure 2 is an enlarged fragmentary view partly in section, illustrating certain clamping means embodying certain features of the invention;

Figure 3 is a sectional view through Figure 1 on the line 3—3, the same being on a reduced scale;

30 Figure 4 is a greatly enlarged view through a lithographic plate after the same has been grained according to the present invention;

Figure 5 is a view similar to the lower part of Figure 1, except that it illustrates a modified construction wherein only one agitating and impelling structure is used.

35 Referring to the accompanying drawings by numeral, 1 indicates a frame of any desired kind, as for instance, a metal frame formed of angle iron etc., riveted or otherwise rigidly secured together. The casing 2 is hingedly connected at 3 to the frame 1 and is provided with a catch 4 for normally holding the same closed. The cover 5 is hingedly connected at 6 to the casing 2 whereby ready access may be had to the upper part of the casing at any time. By reason of the hinge connection 3 the entire casing may be swung to one side when it is desired to insert or remove the drum 7, or for any other purpose. The drum 7 is preferably connected with shaft 8 journaled in suitable members 9 carried by the side walls of the casing 2, whereby whenever the casing 2 is swung to the dotted line position shown in Figure 1, the drum will be swung out of the hopper 10. The hopper 10 is watertight except that it is completely open at the top and at the bottom and has a discharge passageway 11 normally closed by

the cap 12, which may be held in place by threads or other desired means. The hopper 10 accommodates about half the drum 7 and merges into an almost rectangular section 13 which is divided by a partition 14 having any desired number of apertures 15 so that there will be free communication between the respective compartments 16 and 17.

10 In each of the compartments 16 and 17 there is provided a four-bladed agitator or impeller 18. It will be evident that a larger number of blades or a less number could be provided for each impeller. The respective impellers are mounted on the shafts 19 and 20 which extend through the section 13 as illustrated in Figure 3, whereupon a pulley 21 may be secured in any desired manner thereto. Also a gear wheel 22 is connected to each of the shafts 19 and 20, said gear wheel continually meshing so that when power is applied to the pulley 21 the power will be transmitted to both of the impellers 18 so that they will operate at a comparatively high rate of speed.

25 It will be evident from Figure 1 that there is provided a quantity of sand 23 in each of the compartments 16 and 17, and also a supply of water, whereby when the impellers are functioning the water and sand will be forced upwardly in the form of sprays 24 and 25, said water and sand striking the lithographic plate 26 and forming graining thereon. This graining is shown greatly enlarged in Figure 4. From this figure it will be observed that there are provided a number of depressions 27 for retaining the water when the plate is in use. Naturally there will be provided between the depressions 27 a number of raised portions 28 which are rounded more or less. The depressions 27 are really round depressions flaring from the bottom upwardly. The illustration shown in Figure 4 would be a perfect or ideal formation of graining shown on a large scale. In the regular performance of the machine, however, the depressions 27 are seldom formed so accurately but they present in appearance substantially the form shown in Figure 4, namely, rounded protuberances in the same plane with depressions for holding water when the plate is in use. The sand striking the plate is shown in Figure 1 to produce the depressions but does not cut away the plate. The use of water and sand causes the sand to make merely dents each time it strikes and then becomes inoperative until one of the blades of one of the impellers forces the same violently against the plate a second time.

The drum 7 may be solid or hollow and formed of any desired material, though ordinarily it is made solid from suitable material, for instance, wood. This drum carries the axle or shaft 8 which is journaled in suitable bearings 9. This shaft is rigidly secured to drum 7 so as to rotate therewith. The pulley 29 is secured to shaft 8 and receives power from any suitable source whereby it is rotated very slowly, while the impellers 18 are rotated at comparatively high speed, for instance, from about seven hundred revolutions per minute to eighteen hundred revolutions per minute.

As shown in Fig. 1 the plate 26 is clamped by suitable clamps 30 and 31 to the drum 7 and extends slightly over half way around the drum. When the machine is started in operation the clamp 30 is near the spray 24 and as the drum 7 moves slowly in the direction of the arrow 32 (Fig. 1) the action of the water and sand continues. Preferably the drum moves at a rate so that the entire plate 26 will be grained in from ten to twenty minutes according to the speed thereof and the speed of the impellers 18. If the impellers 18 are running at an extra high rate of speed, for instance, as high as would be practicable, the plate 26 might be caused to move at a rate whereby the graining could take place in a short time, for instance, about ten minutes. If the impellers are running at a slow rate of speed the drum 7 could also be rotated at a slower speed, namely, so that the graining may take place in about twenty minutes. After the parts are started in operation the action is automatic. If for any reason the operator should forget to stop the drum 7 and the impellers 18 when the graining has been completed, no damage will be done as the drum will merely continue to rotate and as it passes sprays 24 and 25 will be again bombarded with sand and water, but this will not injure the plate but the action will merely be unnecessary.

The clamping members 30 and 31 as shown in Fig. 1 are shown more in detail in Figs. 2 and 3. From these figures it will be observed that the drum 7 is provided with metallic rings 33 and 34 rigidly secured thereto in any desired manner and projecting a short distance therebeyond. A clamping bar 35 (Fig. 3) extends for the full length of the drum 7 and is provided with hooks 36 and 37 at the respective ends, said hooks fitting over the extending portions of rings 33 and 34. A set screw 38 is carried by the bar 35 at the ends (Fig. 2), said set screws being adapted to be screwed tightly against the rings so that the hooks will be pressed against the under surface of the rings and thereby bar 35 held rigidly in place. This bar carries a number of adjusting screws 39 which are rotatably connected with plates 40 so as to move said plates toward and from the bar 35. Plate 40 is provided with a pair of pins 41 slidably fitting into the respective apertures 42 in bar 35. From this structure it will be observed that whenever the end of a lithographic plate is slid beneath the block or plates 40 of clamp 30, the end may be readily clamped firmly to drum 7 by screwing down on the set screws 39. The opposite clamp 31 is operated in the same way whereby the lithographic plate is normally clamped in place at each of its longitudinal edges and fits snugly against the drum 7 so that there will be a comparatively rigid backing for the plate whereby the bombardment of the sprays 24 and 25 will produce the desired graining action. After the plate has been grained

the parts are stopped and the cover 5 swung to an open position, after which the plate may be disengaged from the clamps 30 and 31 and removed. If desired, a second plate could be mounted in place and the device caused to repeat the same operation on the second plate.

In Figure 1 two impellers have been shown for bombarding the plate to be grained, but it will be evident that a greater or less number of impellers might be used without departing from the spirit of the invention. As shown in Figure 5 a single impeller 43 is disclosed. This impeller is preferably of the same shape as the impellers 18 and functions exactly as the impellers 18, namely, to scoop up some of the sand in the bucket 44 and some of the water and discharge them with some appreciable force in the spray against the plate 26 which is being grained. As there is only one bombarding spray 45 in this form of the invention the drum 7 naturally moves at a slower rate of speed, but the same results are eventually secured. It will be noted that the blades of the impellers 18 and 43 rotate from a central hopper for a certain distance and then curve in the direction of movement, whereby small buckets are formed which scoop up the water and sand and then provide an impelling construction for projecting the sand and water thru the air in a spray. Other blades of different shapes could be used but this shape has been found desirable in that it limits the area of the spray 45 and, consequently, by causing the spray to be constant and the speed of the drum 7 to be constant, will produce a very fine and uniformly grained surface.

In the course of time the sand may become broken up or dirty and when this occurs, or whenever desired, it may be removed as well as the water through the discharge opening 11 by merely removing the cap 12. Water may be pumped in at the top for flushing out the device and then cap 12 replaced, then a supply of clean sand is added and the desired quantity of water which is preferably maintained at a level up to the hub of the respective impellers. The level of sand is always such that each impeller blade is adapted to scoop up sand in small quantities each time it reaches the lowermost point.

I claim:

1. A device for graining lithographic plates, comprising a rotatable drum, a pair of clamps for clamping a plate onto the drum, each of the clamps including a supporting bar, a plurality of clamping blocks, means carried by the clamping blocks extending loosely into said bar so as to be guided in their movement toward and from said drum, and a clamping screw for each block, said screws being carried by said bar and adapted to cause the clamping blocks to press said plate against said drum tightly when moved in one direction, and to move the blocks away from the drum when rotated in the opposite direction, and means for bombarding the plate to be grained as the drum moves.

2. In a graining machine for graining lithographic plates, a drum against which a plate is adapted to be fitted flatwise, a ring secured to said drum at each end, said rings projecting beyond the drum so as to present end flanges, a clamping bar extending longitudinally across the drum, said bar at the ends having hooks adapted to be hooked over said flanges, means for clamping said hooks against said flanges, and a plurality of plate clamping means carried by said bar.