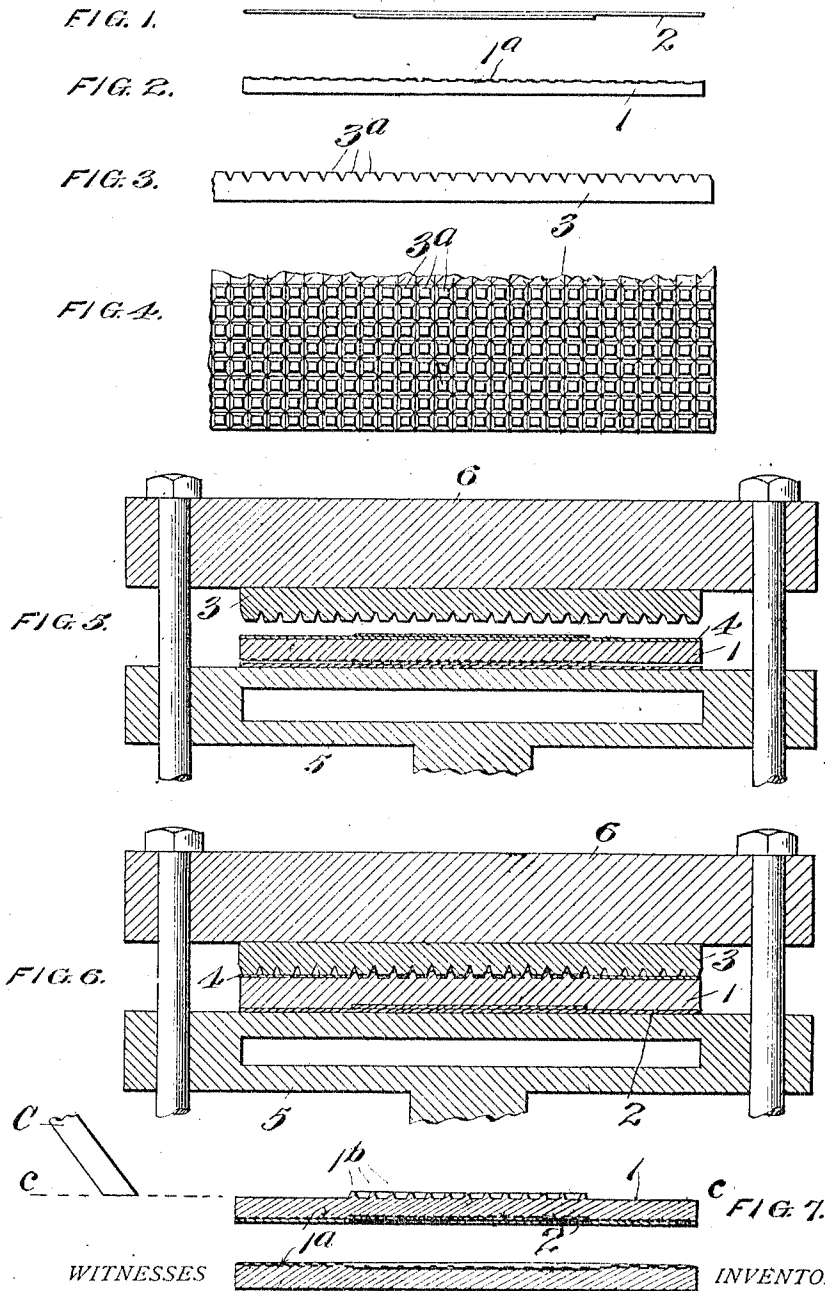


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 APPARATUS FOR TONING PRINTING PLATES.
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1,005,772.

Patented Oct. 10, 1911.



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APPARATUS FOR TONING PRINTING-PLATES.

1,005,772.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MICHAEL A. DROITCOUR, of Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Toning Printing-Plates; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to the production of toned or made-ready printing plates and resides in an improved means of producing such plates.

The present application is a division of my application for process of toning printing plates filed December 15, 1910, Serial No. 597,521.

The object of this invention is to enable printing plates to be toned without crushing any of the fine lines or dots in the printing surface thereof during the toning operation.

In this invention I employ (1) a toning member or reverse overlay to determine the graduations or tones of the printing surface of the printing plate; (2) a novel pressure grader to relieve pressure on those portions of the face of the printing plate where such pressure would be liable to injure the same; and to obtain increased pressure on other portions of the printing plate where it is necessary in order to produce the desired tones; and (3) a novel pressure plate which is provided with numerous recesses or channels in its face opposed to the back of the printing plate, whereby instead of the metal of the printing plate being compelled to flow laterally, when under pressure, in order to enable the plate to be thinned at those points where high lights are desired, the metal is permitted to pass into minute recesses or channels in such "pressure plate" in the shortest and most direct way, so that the face of the printing plate can be toned with very much less pressure thereon than has heretofore been required in the toning process; and the liability of crushing or injuring delicate lines or dots in the printing surface of the printing plate during the toning thereof is practically obviated.

The invention will be explained in detail with reference to the accompanying drawings which illustrate, diagrammatically, one practical means embodying the invention.

In said drawings—Figure 1 is an edge view of a reverse overlay or toning member. Fig. 2 represents an edge view of an ordinary printing plate. Fig. 3 is an edge view of a pressure plate; and Fig. 4 is a face view thereof. Fig. 5 is a sectional view illustrating a printing plate, a toning member, a toning pressure grader, and a pressure plate, in a press preparatory to the application of pressure thereto; and Fig. 6 is a similar view showing the parts under pressure. Fig. 7 is an edge view of the resultant toned printing plate removed from the press, with the toning member applied to its face; and Fig. 8 is an edge view of the finished toned printing plate.

The printing plate to be toned may be an electrottype or stereotype plate 1 of usual construction, but preferably made about seven-thousandths of an inch thicker than it is desired to have the plate when finally toned and ready for use. Such plate, prior to the toning thereof, has a plane printing surface, as indicated in Fig. 2. From this plate a reverse overlay or "toning member" 2 is made in any suitable manner; usually it is made of thin sheets of paper cut and pasted together so as to make this toning member thicker at the points where it is desired to have the plate thinner, and vice versa. In other words this reverse overlay or toning member is made thick opposite the parts of the printing plate which it is desired shall produce high lights in the impressions taken therefrom, and is made thinner opposite those portions of the printing plate which it is desired shall produce solids or darker shades in the impressions. The toning member 2 is placed upon the face 1^a of the printing plate 1 and in register therewith; and then the printing plate is placed face downward, with the toning member beneath it, upon the bed 5 of a suitable press, this bed being preferably heated. The press may be of any suitable construction, but should be such that the bed 5 and platen 6 shall be kept truly parallel at all

times so that they would not of themselves tend to exert unequal pressure upon different parts of a flat plate lying between them, as would be the case if they could move out of parallelism. A pressure plate 3, Fig. 3, may then be placed upon the back of the plate; or may be attached, if desired, to the under surface of the platen 6 of a suitable press. This pressure plate 3 has in its lower face, or contact surface, numerous intersecting shallow channels, as indicated in Fig. 4, which channels may be about one-sixteenth of an inch deep and preferably extend parallel both longitudinally and transversely of the pressure plate, and divide the under surface thereof into minute squares or projections 3^a each approximately one-thirty-second of an inch square, and having their centers approximately one-sixteenth of an inch apart. Preferably the grooves in the pressure plate are slightly wider at their mouths than at bottom, thus imparting a slight taper or pyramidal shape to the projections 3^a so that any metal which may enter the channels can be withdrawn freely therefrom.

Preferably I interpose between the back of the printing plate 1 and the pressure plate 3, a toning pressure-grader 4 (Figs. 5 and 6). This pressure-grader may be formed like the toning member of any suitable material; but I preferably make it of layers of paper graduated according to the pressure necessary to effect the desired toning of the printing plate. This toning pressure-grader supplements the action of the toning member 2, being made thicker where the printing plate requires more pressure to give the desired tone; and thinner where the surface of the printing plate is of such a nature that pressure would have a tendency to crush or mash the same. In other words, the pressure-grader 4 is a means whereby the pressure imparted by the press can be varied in its effect upon the printing plate according to the subject matter in said plate. The pressure-grader when properly made will protect the delicate parts of the printing surface of the printing plate, which excessive pressure might injure, and increase the pressure on the printing plate where such pressure is required.

Operation: The printing plate 1, to be toned, is placed face downward upon the bed 5 of the press, with the toning member 2 beneath it but properly applied against its printing surface; the pressure-grader 4 is then laid upon the printing plate and against the back thereof; the pressure-plate 3 is arranged or placed above the pressure-grader with its channeled face next the pressure-grader, see Fig. 5. The said parts are then forcibly clamped between the press bed 5 and platen 6; the bed being preferably heated to a temperature of about 350°

F. Sufficient pressure is applied to cause the face of the printing plate to conform to the toning member or reverse overlay applied to the face thereof, the printing plate being most forcibly pressed toward the toning member where most pressure is required in order to tone the printing plate, and to reproduce on the face thereof the tones of the toning member or reverse overlay. Injury to the printing surface of the printing plate is prevented because the channels in the pressure plate 3 provide a ready outlet for surplus metal, and allow the metal at the back of the plate, opposite the projections on the toning member, to protrude into said channels, as indicated in Fig. 6; and because the metal can thus crowd back into those channels or recesses there is no lateral flow of the metal in the printing plate such as has heretofore been necessary when a plane surfaced pressure member was employed; hence the toning operation can be effected with very much less pressure upon the printing plate than has hitherto been required. As a result of this pressing operation the face of the printing plate is caused to reversely conform to the opposed surface of the toning member 2; in other words there will be slight depressions in the face of the printing plate opposite the places where the toning member is thick; and there will be projections 1^b of metal on the back of the printing plate opposite the points where its face is depressed, as indicated in Figs. 6 and 7. To remove such projections and any inequalities from the back of the toned printing plate; the back of such plate may be shaved, as indicated in Fig. 7, while its face is still in contact with the toning member 2; thereby reducing the back of the printing plate to a plane surface, and making the printing plate of proper thickness for printing, while leaving the face of the printing plate toned in the desired manner. Fig. 7 indicates a toned printing plate removed from the press and ready for the final shaving operation; and indicates at 1^b how the metal has been forced upward on the back of the printing plate into the channels of the pressure plate 3; and such printing plate can be brought to the desired thickness by shaving it along the line *c-c* by a cutter C, or other suitable means. Afterward the toning member 2 is removed and the finished printing plate, represented in Fig. 8, remains;—the surface of this plate being toned ready for printing. I thus produce a printing plate having different tones in its printing-surface, as indicated in Fig. 8, and during the toning operation the surplus metal, where the pressure is greatest, instead of having to flow out in all directions from beneath the edges of the flat press platen can simply move into the

adjacent channels in the pressure plate 3; thus obviously overcoming the lateral flow of the metal and locally holding the pressure necessary to tone the printing plate, whether such pressure must be greater or less on different parts of the printing plate; but where greater pressure is necessary to tone part of its face I locally hold it there, and the metal does not laterally flow to points where it could damage the plate.

While some printing plates might be effectively toned without the employment of the pressure-grader 4, yet for fine work the most satisfactory results are obtained by using the pressure-grader 4, as the success of the toning operation is in the main, if not altogether, due to the toning pressure-grader 4 in combination with the pressure plate 3 which allows for metal displacement without lateral flow thereof. Obviously the use of the pressure plate 3 greatly lessens the amount of pressure heretofore required to tone a printing plate, lessens the danger of crushing the printing surface of the printing plate during the pressing operation; and removes the danger of distorting fine lines in the printing surface of the printing plate by lateral flow of metal therein during the toning operation.

The pressure-grader 4 as above stated enables greater pressure to be applied to any portion of the printing plate where it may be desired, without affecting the tone imparted to the printing surface of the printing plate by the toning member. It would not do to thicken the toning member to gain increase of pressure at such points because the thickening of the toning member would alter its toning effect upon the printing plate. But by using both a toning member and a pressure-grader I can obtain the most delicate toning effects in the face of the printing plate and at the same time obtain any desired graduations in the pressure upon the printing plate that will facilitate the toning operation, and enable the same to be performed expeditiously and economically in any ordinary press. And the employment of a channeled pressure plate in connection with the toning member and pressure-grader localizes excessive pressure on the printing plate by obviating lateral flow of the metal therein, which otherwise would tend to flow laterally and distribute the pressure equally throughout the printing plate.

What I claim is:

1. In apparatus for producing toned printing plates, a toning member adapted to be applied to the printing surface of a printing plate, a channeled pressure plate adapted to be applied against the back of the printing plate, and means for subjecting these parts to pressure whereby the metal on the back of the plate is permitted to flow or pass into the channels in the face of the

pressure plate and the face of the printing plate is caused to reversely conform to the surface of the toning member.

2. Apparatus for producing toned printing plates, consisting of a toning member adapted to be applied to the face of a printing plate, a pressure plate having minute channels in its face adapted to be applied against the back of the printing plate, and means for subjecting these parts to pressure; whereby the face of the printing plate is caused to reversely conform to the surface of the toning member and the metal on the back of the plate is permitted to flow or pass into the channels in the face of the pressure plate at those points where displacement of metal is necessitated in order to tone the printing surface of the printing plate in accordance with the toning member.

3. In apparatus for toning printing plates, a toning member adapted to be applied to the face of a printing plate, a pressure-grader adapted to be applied to the back thereof, and means for subjecting the said parts to pressure sufficient to cause the printing surface of the printing plate to reversely conform to the toning member.

4. Apparatus for toning printing plates, consisting of a toning member adapted to be applied to the face of a printing plate, a pressure-grader adapted to be applied to the back thereof, a pressure plate having a channeled surface adapted to be applied against the pressure grader, and means for subjecting said parts to sufficient pressure to cause the printing surface of the printing plate to reversely conform to the opposed surface of the toning member.

5. Apparatus for toning printing plates, comprising a toning member adapted to be applied to the face of a flat surfaced printing plate, a pressure-grader adapted to be applied to the back of said printing plate, a pressure plate having a channeled surface adapted to be applied against the toning layer, and means for subjecting the said parts to pressure sufficient to cause the printing surface of the printing plate to reversely conform to the toning member; the metal at the back of the plate passing into the channels in the pressure plate at the points where displacement of the metal is necessary to effect toning of the printing plate in accordance with the toning member.

6. The herein described apparatus for toning printing plates, comprising a reverse overlay adapted to be applied to the face of a flat surfaced printing plate, a pressure-grader adapted to be applied to the back of such printing plate, a pressure plate having a channeled surface adapted to be applied to the pressure-grader; and means for subjecting the said parts to pressure to cause the printing surface of the printing plate to reversely conform to the opposed

surface of the reverse overlay, and surplus metal in the back of the plate to flow into the channels in the pressure plate at those points where displacement of the metal is
5 necessary to effect the toning of the printing plate.

In testimony that I claim the foregoing

as my own, I affix my signature in presence of two witnesses.

MICHAEL ANDREW DROITCOUR.

Witnesses:

CHAS. HICKMAN,
PERCY G. SHAW.