No. 871,598. PATENTED NOV. 19, 1907.

C. M. KNEPPLER.

METHOD OF GRAINING METALLIC LITHOGRAPHIC PLATES.

APPLICATION FILED JUNE 13, 1907.

2 SHEETS—SHEET 1.

Fig. 2.

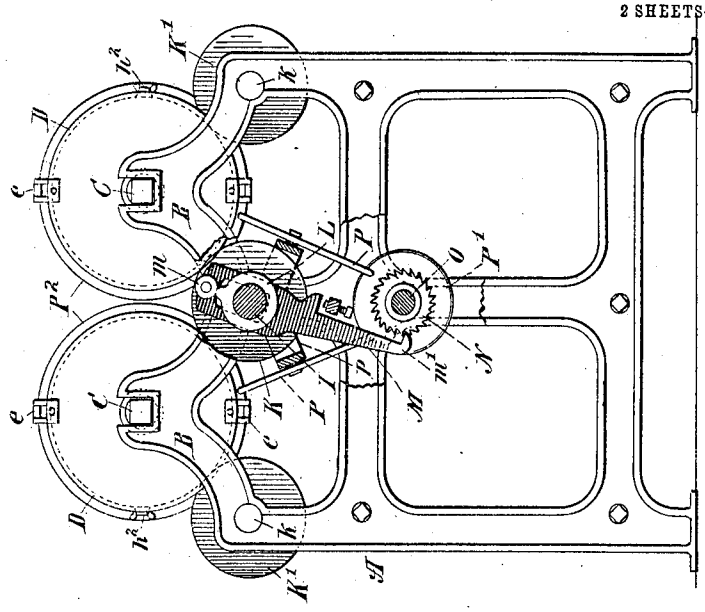
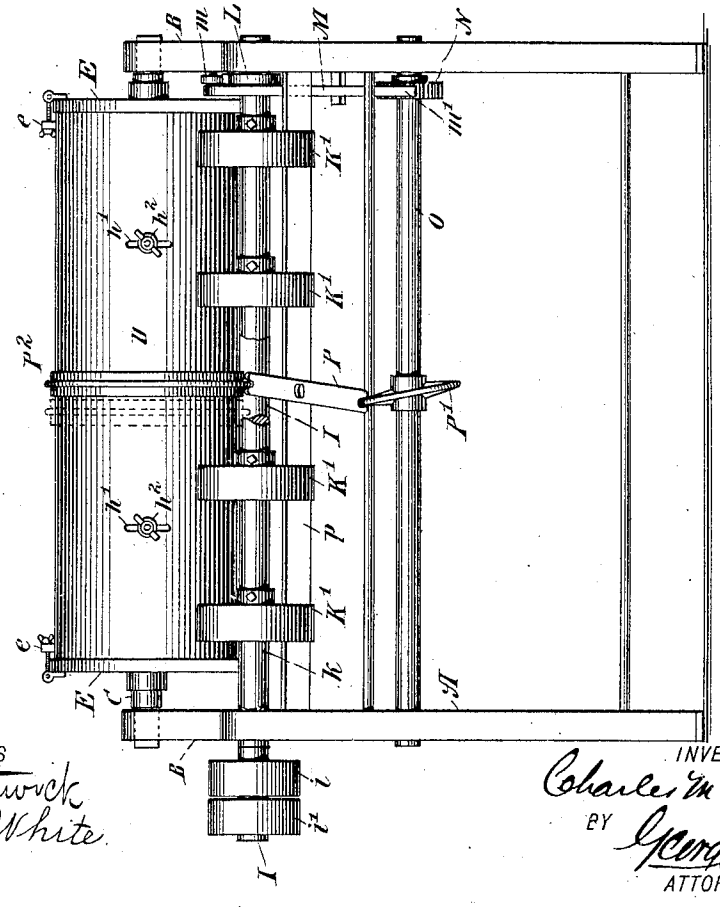


Fig. 1.



WITNESSES

M. Van Nortwick

John B. White

INVENTOR

Charles M. Knepple

BY George Cook

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

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C. M. KNEPPLER.

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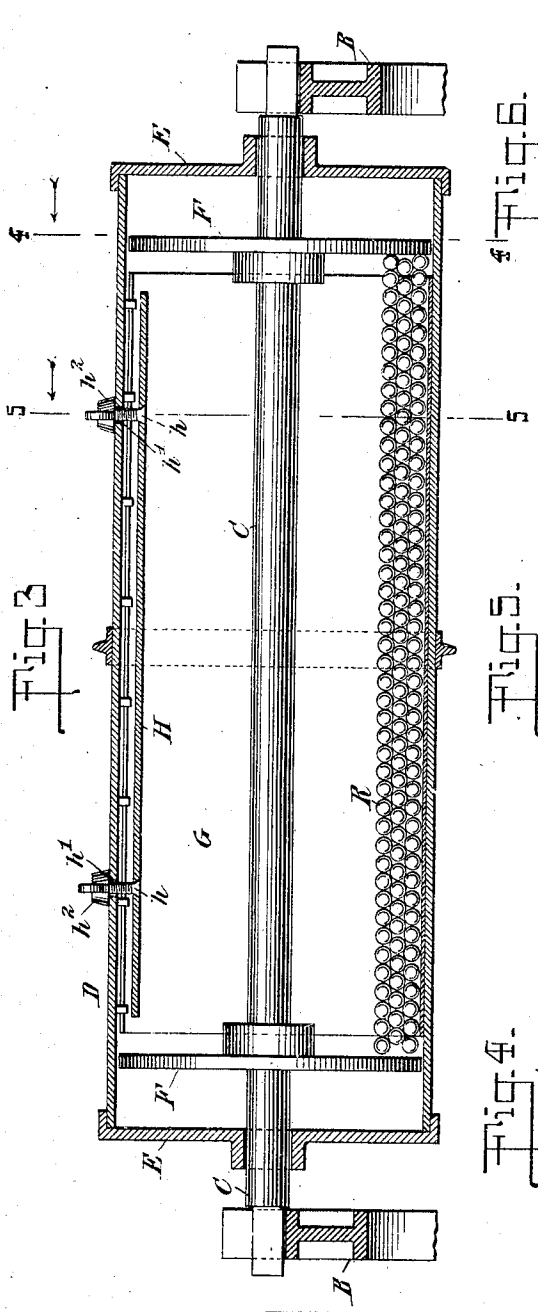


Fig. 3.

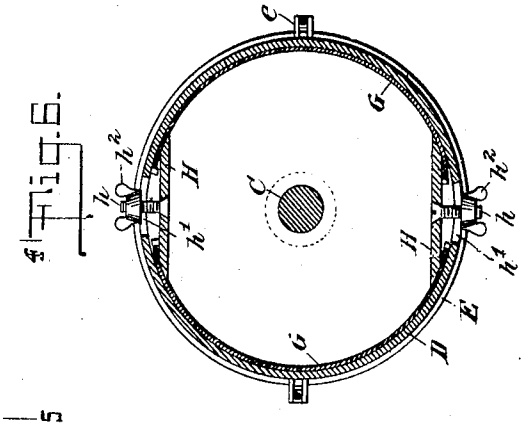


Fig. 6.

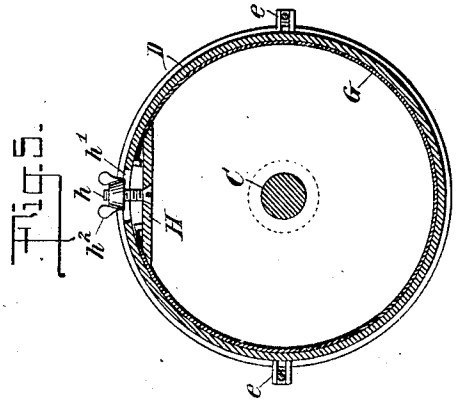


Fig. 5.

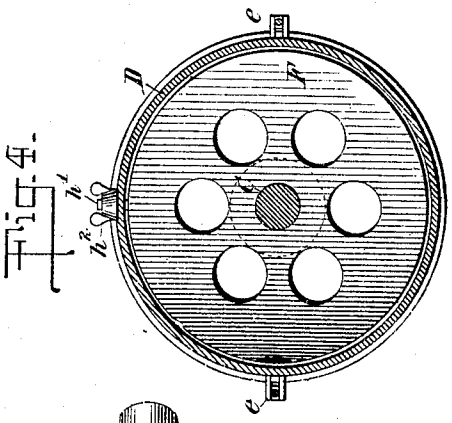


Fig. 4.

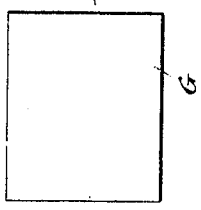


Fig. 7.



Fig. 8.

WITNESSES

M. Van Kortwick

John B. Burns

INVENTOR

Charles M. Knepppler

BY George Cook

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES M. KNEPPLER, OF NEW YORK, N. Y., ASSIGNOR TO LOUIS E. KNEPPLER, OF NEW YORK, N. Y.

METHOD OF GRAINING METALLIC LITHOGRAPHIC PLATES.

No. 871,598. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed June 13, 1907. Serial No. 378,692.

To all whom it may concern:

Be it known that I, CHARLES M. KNEPPLER, a citizen of the United States, and a resident of New York, borough of Brooklyn, in the county of Kings and State of New York, have made and invented certain new and useful Improvements in Methods of Graining Metallic Lithographic Plates, of which the following is a specification.

My invention relates to an improved method of treating or graining metallic lithographic plates, formed from either zinc or aluminium, the object of the same being to so treat a plate of this character as to enhance the printing qualities thereof and the value of the work to be obtained from the use thereof.

So far as I am aware, it has heretofore been the custom to grain zinc or aluminium lithographic plates while in a flat condition, but I have discovered by various experiments that if the plate be first rolled or bent into a cylindrical form and the inner side or surface thereof be then subjected to the action of the graining material, and the plate finally straightened or flattened out, much "life" or printing qualities will be added or imparted thereto. In rolling or bending the plate into its curved or cylindrical shape, the metal comprising the inner surface of the plate will be crowded upon itself, effecting a surface of close texture, and if while in such condition, it be grained, the resulting plate when returned to its normal condition will be possessed of qualities incapable of being secured when the plate is grained in the ordinary way.

With these and other ends in view, the invention consists in the novel method hereinafter described and specifically pointed out in the claims.

While I do not intend that my invention shall in any wise be limited to any particular machine, device, or apparatus for carrying out the method hereinafter described, I have shown in the accompanying drawings one form of the apparatus which I have practically used, and with good results, the same being described and claimed in Letters Patent granted to me May 28th, 1907, and numbered 854,953.

In the accompanying drawings Figure 1 is a view in side elevation of the device. Fig. 2 is an end elevation thereof. Fig. 3 is a longitudinal sectional view thereof. Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3. Fig. 5 is a sectional view taken on the line 5—5 of Fig. 3. Fig. 6 is a similar view showing the apparatus containing two plates. Fig. 7 is a plan view of the plate prior to being bent or shaped, and prior to its subjection to the graining process. Fig. 8 is a perspective view of the plate properly bent or shaped before graining.

Referring to the drawings, A represents a frame constructed of metal or wood, and of any desired shape or size, the ends thereof being provided with the brackets B adapted to support the ends of the shaft C. On this shaft C is mounted the cylinder D, adapted to revolve and to reciprocate thereon, said cylinder being provided with the removable ends E secured to said cylinder by means of the clamps *e*. To the shaft are removably secured the perforated plates or disks F, so separated as to allow the curved metallic plate G to be contained between the same when properly located within the cylinder D for graining.

Within the cylinder D is contained the clamping plate H, provided with the bolts *h* extending upwardly through holes or openings h^1 formed in the cylinder, winged nuts h^2 being threaded on said bolts and bearing on the outer side or surface of said cylinder for tightly securing the clamping plate H in position.

As illustrated in Fig. 6, the clamping plate H with its attachments, may be duplicated upon opposite sides of the cylinder, in order that two or more plates G may be clamped within said cylinder and treated simultaneously.

In the frame A of the machine is mounted the shaft I, provided with the tight and loose pulleys *i* and *i'*, respectively, and through which pulley *i*, power is transmitted to the machine. On the shaft I, and revolving therewith, are tightly secured the wheels or rollers K, and to the shafts *k*, mounted in the frame A, are secured the rollers or wheels K', the cylinders D resting thereon.

From the above it will be understood that when motion is imparted to the shaft I through the pulley *i*, the wheels or rollers K will impart a rotary movement to the cylinders D resting thereon.

To the shaft I is tightly secured the cam L, and loosely mounted on the shaft I is the pawl M, provided on one end with the roller

m adapted to engage the cam L, the lower end of said pawl being provided with a hook or catch m' wherewith to engage the ratchet wheel N tightly secured to the shaft O, the ends of which are mounted in the frame A of the machine.

On the cross bar p of the frame is fulcrumed the lever P, one end of which engages the cam wheel P′ on the shaft O, the opposite end engaging with the flange P^2 encircling the cylinder D.

It will be understood from the above that when the shaft I is rotated, the riser or projection on the cam at each revolution will come in contact with the roller m, thereby raising the pawl M, the lower hook end thereof engaging with the ratchet N, causing the latter to rotate one notch. As the cam L revolves, the pawl M will drop by gravity, the lower bent end m' engaging with the next lower tooth of the ratchet N. As the pawl is thus raised from time to time, the shaft O is rotated, thereby causing the lever P engaging with the cam P′, to move to the right and left, thereby effecting a slight intermittent reciprocating movement of the cylinders D.

In carrying out my improved method, the flat zinc or aluminium plate G, illustrated in Fig. 7, is first rolled, bent or curved into the cylindrical shape, as shown in Fig. 8, whereby the metal constituting the inner or printing surface to be subjected to the graining action, will be crowded upon itself closing the pores of the metal. In this condition it is inserted within the cylinder D and subjected to the action of the graining material R, the latter consisting of pebbles, gravel, marble, sand or other desirable material, such being selected as will produce the fine or coarse grain desired.

When motion is imparted through the pulley i to the shaft I, the cylinders D will be slowly rotated and at the same time intermittently moved toward and away from the ends of the frame, such movement preventing any circular streaks or lines on the contained plates, as would likely happen should the graining material and cylinder be not moved longitudinally with relation to each other. After being subjected to the action of the graining material, the bent or curved plate R is then removed from the cylinder and flattened out to its original form, as illustrated in Fig. 7, the grained surface assuming the same condition as before being bent or rolled. I have found by experiment that by so treating the plate the surface is of far better quality and contains much more "life" than one which is grained or treated while flat, the prints taken therefrom being far superior to those printed from the ordinary plate.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The method hereinbefore described of producing metallic lithographic plates, consisting in subjecting the inner surface to the action of abrading material while said plate is in a curved form, and then flattening said plate.

2. The method hereinbefore described of treating metallic lithographic plates, consisting in first curving said plate, subjecting the inner surface of said plate to the action of graining material, and finally flattening said plate.

Signed at New York, borough of Manhattan, in the county of New York, and State of New York, this 12th day of June, A. D. 1907.

CHARLES M. KNEPPLER.

Witnesses:
M. VAN NORTWICK,
JOHN B. WHITE.