E. E. NOVOTNY.

METALLIC BACKED PRINTING PLATE.

APPLICATION FILED DEC. 13, 1916.

1,377,506. Patented May 10, 1921.

Fig. 1.

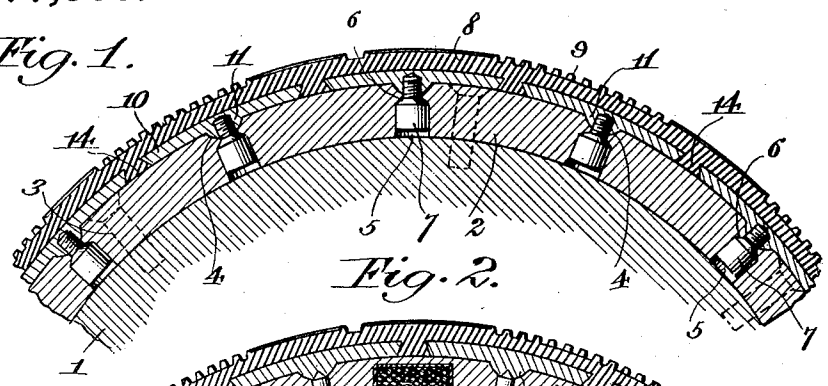


Fig. 2.

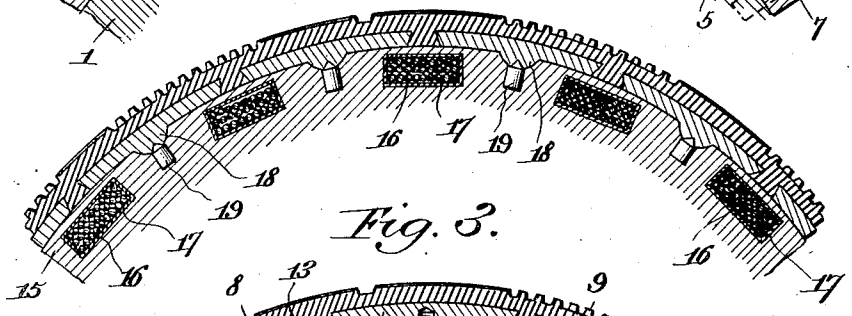


Fig. 3.

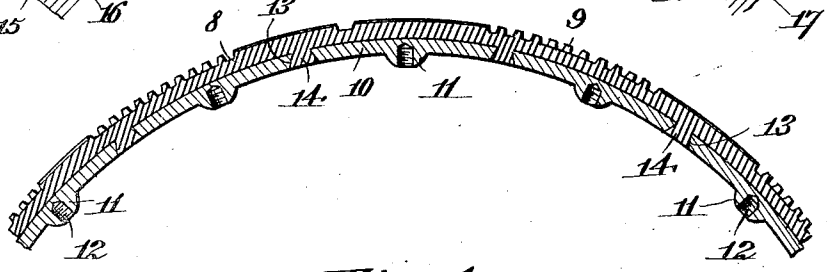


Fig. 4.

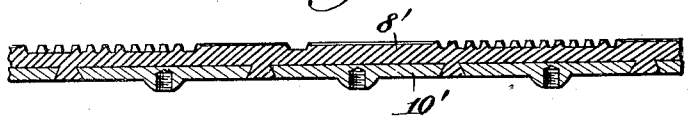
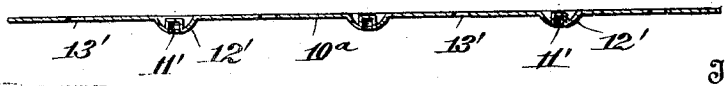


Fig. 6.



Fig. 5.



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METALLIC-BACKED PRINTING-PLATE.

1,377,506. Specification of Letters Patent. Patented May 10, 1921.

Application filed December 13, 1916. Serial No. 136,673.

To all whom it may concern:

Be it known that I, EMIL E. NOVOTNY, a citizen of the United States, and resident of Riverside, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metallic-Backed Printing-Plates, of which the following is a specification.

This invention relates to printing plates such as are used on presses for the purposes of embossing or printing, and has particular application to a plate of this character which is so constructed as to enable it to be positively, quickly and conveniently secured in proper position or location upon the press thereby insuring accurate registration relative to the sheets during the printing operation.

The present invention is applicable to both flat plates, such as are used in connection with bed and platen printing presses, and to curved or cylindrical plates, such as are employed in rotary presses, and in the preferred form of the invention illustrated herein the printing face of the plate is made from a phenolic condensation product of which there are several well known varieties, such as "condensite," "bakelite" and the like.

As is well known, commercial "condensite" and "bakelite" will assume a hardened, set and infusible form when subjected to heat at a temperature of from 250 to 400 degrees F. for example, these products charring or decomposing at about 550° F., so that the actual working temperature is about 350°.

It is my purpose in the present instance to provide a printing plate of composite construction, that is to say, embodying a printing face comprising a face section and a backing therefor, the backing being preferably united to the printing face section of the plate during the molding or casting of the latter, such backing section being equipped with means by which it, and consequently the complete composite plate, may be readily, conveniently and firmly fastened to a saddle carried by the cylinder or bed of the press, or may, if desired, be fastened directly to such cylinder or bed, that is to say, may be used without employing the intervening saddle.

With the above recited objects and others of a similar nature in view, my invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the drawings:

Figure 1 is a transverse vertical sectional view taken through a segment or portion of a cylinder or printing press equipped with a saddle to which is attached my improved plate.

Fig. 2 is a similar view, but taken through a cylinder wired to be magnetized, the interposed saddle being dispensed with and the plate held directly against the cylinder by magnetism.

Fig. 3 is a cross sectional view of the plate shown in Fig. 1.

Fig. 4 is a cross sectional view taken through one form of a flat plate embodying my invention.

Fig. 5 is a cross sectional view taken through a modified form of backing sheet or shell.

Fig. 6 is a cross sectional view taken through a modified form of flat printing plate.

Referring now to the accompanying drawings in detail; and particularly to Figs. 1 and 3, the numeral 1 indicates a portion of a press cylinder to which is bolted the curved or segmental saddle 2, suitable bolts 3 being provided for this purpose. This saddle 2 is in the nature of a curved plate of any suitable material and is formed with a series of small sockets or depressions 4 in its upper face, these sockets being preferably arranged in rows and spaced predetermined distances apart. Opening through and into each socket is a screw bore 5 which also opens through the back face of the saddle, the end of the bore opening into the socket being reduced or tapered as at 6 to snugly receive the head of the screw 7, the shank of which when such screw is in place projects through the sockets and is intended to be screwed into an adjacent boss on the backing section of a printing plate, as hereinafter described.

The curved printing plate shown in Fig. 3 in the present instance comprises a face sheet 8 having an impression-producing or printing surface 9 formed thereon. This facing sheet, or section 8 of the plate, is preferably molded or cast from a phenolic condensation product, such as "condensite,"

"bakelite," or the like. The backing sheet or section for the plate 8 is shown at 10 and may be of any suitable material, such as a phenolic condensation product, metal, or any other material suitable for the purpose. This backing sheet 10 is previously made, as by casting, with a series of bosses 11 spaced suitable distances apart, in actual practice the spacing being the same as the spacing of the sockets or depressions of the saddle, and each of these bosses is formed with a threaded socket 12 to receive the shank of one of the screws 7. Furthermore, between the bosses, the plate has formed, in the present instance, a suitable number of apertures or openings 13, the walls of which diverge relatively to each other to form a dove-tail member or anchoring means for the correspondingly shaped or dove-tailed lugs 14, which are formed on the facing sheet, or section 8 of the plate in the casting of the plate.

In the manufacture of the plate shown in Fig. 3 the matrix or mold from which the printing face or section of the plate is formed is first placed in a suitable casting box and a body of the material, such as the phenolic condensation product is then supplied to the mold. Upon this sheet or body of phenolic condensation product is placed the backing plate 10 and the casting box is then closed, and heat and pressure, or heat, pressure and cooling applied to cause the molding of the facing section 8 of the plate and the anchoring of the latter in the backing section 10. Of course suitable sockets or depressions in the upper platen of the casting box will accommodate the bosses on the back of the backing section or sheet 10 during the casting operation. When the plate has been completely cast as just described, or has set to the requisite hardness it may be removed from the casting box and may now be fastened to the saddle, and to the press when desired for use, as shown in Fig. 1, and as hereinafter described.

If desired, instead of resorting to the use of the intermediate saddle to which the plate is fastened, and which saddle in turn is bolted to the press cylinder, I may make use of the modified form shown in Fig. 2. In this case I dispense with the use of the saddle, but the cylinder 15 is magnetized through suitable electromagnetic means illustrated conventionally at 16, wherein I have shown wires extending longitudinally of grooves 17 cut in the inner face of the cylinder, and in this instance in order to fasten the printing plate to the cylinder, it is only necessary to center the bored bosses 18 of the backing sheet or section of the plate on the studs or pins 19 projecting from the cylinder face, the printing plate itself being positively and firmly held in place against the cylinder by magnetic action and is also held against shifting by the pins 19 seating in the sockets 18.

In Fig. 4 I have shown my invention as embodied in a flat, instead of a curved plate, in this instance the facing or impression producing section 8′ of the plate being flat to correspond to the backing 10′ thereof.

In Fig. 5 I have shown a further modified form of backing sheet or section 10^a which is preferably though not necessarily in the nature of a metallic sheet and may be stamped from a single piece of metal to form the bosses 12′, each of which is provided with a screw bore 11′; this plate is also formed with the dovetailed openings 13′ intended to anchor the similarly shaped lugs formed on the back of the facing section of the printing plate.

In Fig. 6 the facing or printing section 8^a of the plate is cemented or united to the backing plate 10^b through the agency of a suitable binding material, and in this instance the backing 10^b may also be of metal or other suitable material, and when the plate is applied to the press it is held in position by suitable plate clamps well known in the art.

I am aware of the fact that it has hitherto been proposed to make a printing plate comprising a cementitious or plastic printing face imposed upon a relatively hard, non-flowing backing as exemplified, for instance, in the patent to Michael Smith 1,093,015. In said patent however the printing face layer or sheet is composed of a permanently fusible substance which will always become soft and plastic at a relatively low temperature of say 200° F. I am also aware of the fact that it has been proposed to impose a printing face sheet or layer of fusible, plastic phenolic material upon a backing layer composed of a fusible plastic phenolic substance as set forth in the patent to Jonas W. Aylsworth 1,098,610, these two layers or sheets of phenolic material being then subjected to heat and pressure simultaneously in the molding of the complete printing plate until both layers assume a hardened, set and infusible form.

In instances where a permanently fusible facing is imposed upon a hard, non-flowing back, and which facing always resumes its plastic condition at a relatively low temperature, a successful commercial printing plate cannot be produced because the facing surface has a tendency to warp, and to soften and rapidly break down and wear out. Furthermore it is practically impossible to use such a plate in making stereotypes, because the facing will not withstand the degree of heat necessary in the reproduction and drying of the stereotype matrix thereon. On the other hand where the plate is made of a phenolic facing and a phenolic backing both

simultaneously heated, hardened and rendered infusible at the time of making the complete printing plate, it is impossible to obtain satisfactory results because of the fact that as the backing is in a soft, plastic, flowing, fusible condition at the time of making the plate and as molding pressure is exerted against the facing possessing similar plastic characteristics, the flowing of the backing will tend to destroy, in fact does destroy the type levels and outlines and half-tone dots instead of giving the sharp, clean cut, square and well defined characteristics so essential for high grade printing. In a word, a phenolic plate made by pressing the soft phenolic facing sheet against a soft puttylike phenolic backing is practically worthless as it is impossible to produce the proper type face owing to the spreading, oozing, displacing and yieldability of the material of the backing at the time of molding the face.

As contra-distinguished from such prior plates and methods of making the same it will be noted, that as hereinbefore mentioned, I prepare my perforated backing sheet, layer or section previous or prior to the operation of molding the printing face thereon so that when the backing is placed in the plate molding press it is in the form of a perforated, hard, comparatively rigid, non-flowing substance, sheet metal for example as shown in Fig. 5. The fusing or melting point of sheet metal is, as is well known, upward of 2000° F., therefore far in excess of the working temperature of such phenolic compositions as bakelite and condensite. Naturally my backing must be of such a character as to remain hard, stable and non-flowing under the molding of the printing plate, as otherwise the spreading of the material of the back would result in the destruction, distortion or in some instances the complete closing of the anchoring apertures and holes and consequently make it impossible to successfully construct the plate. Thus I provide a previously prepared non-flowing backing, of metal for instance, which is not subject to side flow or distortion under pressure and by means of such backing I obtain a direct and rigid pressure against the phenolic facing, forcing the latter firmly and closely against the molding face of the matrix and therefore insure sharp, clean cut, square and well defined printing characteristics on the face of the plate.

While I have herein shown and described certain preferred embodiments of my invention I wish it to be understood that I do not confine myself to all the precise details of construction set forth by way of illustration, as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the appended claims.

What I claim is:

1. A composite printing plate having a face section of hard phenolic material and a backing section therefor of non-phenolic material, and means, including complemental projections and projection-receiving openings, for permanently uniting the printing face section with the backing section.

2. A composite printing plate comprising a printing face section of hard infusible phenolic material having depending projections of similar material formed integral with the underside thereof, and a backing section of non-flowing material having spaced openings therein adapted to receive and be filled by the projections of the printing face section whereby said sections are permanently united.

3. A composite printing plate comprising a printing face section of a hard and set phenolic material, a metallic backing section, and means for permanently uniting the face section with the back section.

Signed at New York, in the county of New York, and State of New York, this 8th day of December, A. D. 1916.

EMIL E. NOVOTNY.