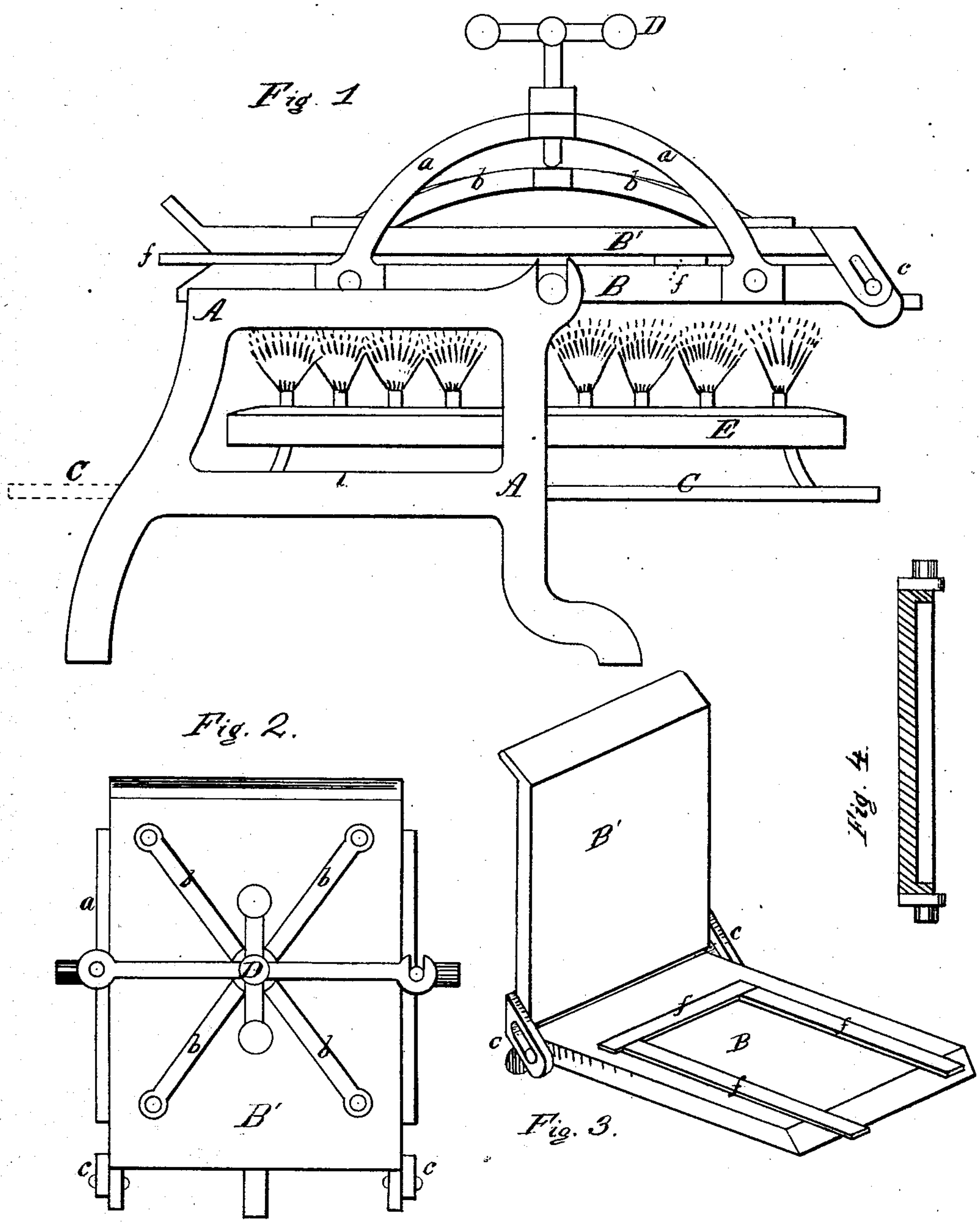
J. S. BROOKS.

Backing Electrotype Shell.

No. 163,449. Patented May 18, 1875.



Witnesses

Andrew J. Bigley

R. Deakers

James S. Brooks, Inventor

By Connolly Bros & McTighe, Attorneys

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JAMES S. BROOKS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN BACKING ELECTROTYPE-SHELLS.

Specification forming part of Letters Patent No. **163,449**, dated May 18, 1875; application filed December 23, 1874.

To all whom it may concern:

Be it known that I, JAMES S. BROOKS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Backing Electrotypes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a plan view of plates B B′. Fig. 3 is an isometrical perspective of the plates when open, showing the guide-rules. Fig. 4 is a section of plate B, showing ledge.

My invention relates to improvements in a method and device for "backing up" electrotypes.

The present method of backing up is as follows: The type or copper shell is taken and laid face downward in a metal pan, which has been previously heated; then the type-metal or backing is poured in on the shell. In consequence of the heat below and cool air above the shell instantly feels their combined influence, and, before the type-metal can assume a solid state, warps, by unequal distribution of heat. Besides the depressions in its face, the shell, by expanding at the point of pouring, and by reason of its lightness compared to lead, generally turns up at one or more corners, and has a tendency to float on the metal. Thus a portion of the molten metal runs in under the shell, and more or less defaces it. This produces the unevenness or hollows in the face known as "sinks." Then the back, also, of the plate, is uneven, from the same causes, and must be planed down and made true. Afterward, before "blocking," the sinks, which sometimes pit the whole face of the plate, must be punched out from the back, and in some cases almost re-engraved; and the metal which has run under the shell and adheres to its face must be carefully cut away. The consequence of all this is that much time and labor are lost, and even then only one step is taken, the smallest portion of the work done, as the plate is by no means perfect.

I propose to remedy all these defects, and at one single operation back a shell so that its face needs no finishing, its back no planing, and of the exact thickness for the purpose intended, thereby saving all the time and labor now expended in the operation of finishing, which, under the present method, is about five-sixths of the whole time occupied in producing a backed and finished electrotype. To effect this desired result I proceed as follows:

I construct a pair of pans or plates, connected by slot-hinges, and both when closed swiveling in one, at or above their middle point, by means of a horizontal pivot on the lower plate, and bearing on the frame. These plates are made true and smooth on their juxtaposed surfaces, and when closed together, or nearly so, are held by a suitable clamp. These plates are placed on an open metallic framework, which is provided with proper bearings for the pivot or pintle, so that both plates may be canted up to a vertical or inclined position. Under the frame, and at a suitable distance, I place lamps or any heating apparatus, extending under the back surface of one plate, upon which the other plate lies, for the purpose of heating both plates and the rules to the same degree of temperature before backing up the shell. When heated to the proper degree, the copper electrotype, after similar heating, is placed face downward on one of the plates, and on and around three of its edges I lay the metallic rules or guides, of the exact thickness required in the backing.

The fourth side, the one toward the outer end of the truing-plate, is left open, so as to leave an opening for the pouring of the metal; then I turn down the other plate on this, and clamp the two firmly together by means of a screw or other power. By this means the rules or guides, which are made accurate, so as to give a true rectangular shape to the backing, are pressed firmly down upon the edges of the shell, and totally prevent the metal from obtaining entrance under it in any way. The temperature of the truing-plates, shell, and guide-rules being all equal to each other and equal also to that of the molten metal, the shell remains as true and perfect as it came from the bath, and consequently there exists no cause for its warping. While in this condition the whole is canted on its bearings, and

the molten metal poured in at the mouth of the plates. There is no place for it to go except between the back of the shell and the juxtaposed truing-plate, which it does. When solidified and partially cooled the pressure is relaxed, the truing-plates opened apart, the guide-rules removed, and the electrotype is ready for blocking, no finishing whatever being required, except to saw off the paper-like edge of the type. By this method plain or curved plates may be readily produced with little labor and no waste or loss of time, or loss by spoiled shells.

Referring to the accompanying drawings, A represents the frame-work and support for the truing plates or pans B B′ and the heating-slide C. The pan or plate B is swiveled horizontally at or near its middle point. From its side edges rise arched bearings *a a* for the cross-head of the screw D, which bears upon the junction of four arched arms, *b b b b*, extending toward and bearing upon the four corners of the plate B′, so as to give an equal pressure. The cross-head is swiveled at one side, and catches at the other for bearing. The purpose of swiveling the cross-head is to turn it out of the way, in order to open the plates B B′ apart. These plates are hinged by slot-hinges *c c* at their adjacent ends, so as to adjust themselves to the different thicknesses of the backing required. E is the heating arrangement, which may be of any form. This rests upon the slide C, which must be pushed outward before the plates can be canted for pouring. *f f f* are the guide-rules, which hold down the edges of the shell, and regulate both the thickness of backing and the size and shape of the finished plate. The pan or plate B has a ledge made on its under surface to keep the flames confined.

What I claim is—

1. The method of producing finished electrotype-backs, consisting in securing the shell, face downward, between true and parallel plates, determining the size and thickness of the back by adjustable straight-edged metallic rules, constructed and adapted to give a true and finished edge, heating all to a uniform temperature, and then pouring the molten metal upon or between the back of the shell and the upper or opposing plate, as described.

2. The apparatus for backing electrotypes, consisting of hinged and swiveled plates B B′, frame A, slide C, and heating appliance, supports *a*, arms *b*, pressure D, and guide-rules *f*, combined and operating as described.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of December, 1874.

JAMES S. BROOKS.

Witnesses:

JOHN E. LEYDEN,

T. J. MCTIGHE.