(No Model.)

A. JONES.

Process of Producing Engraved Plates.

No. 241,021. Patented May 3, 1881.

Fig. 1

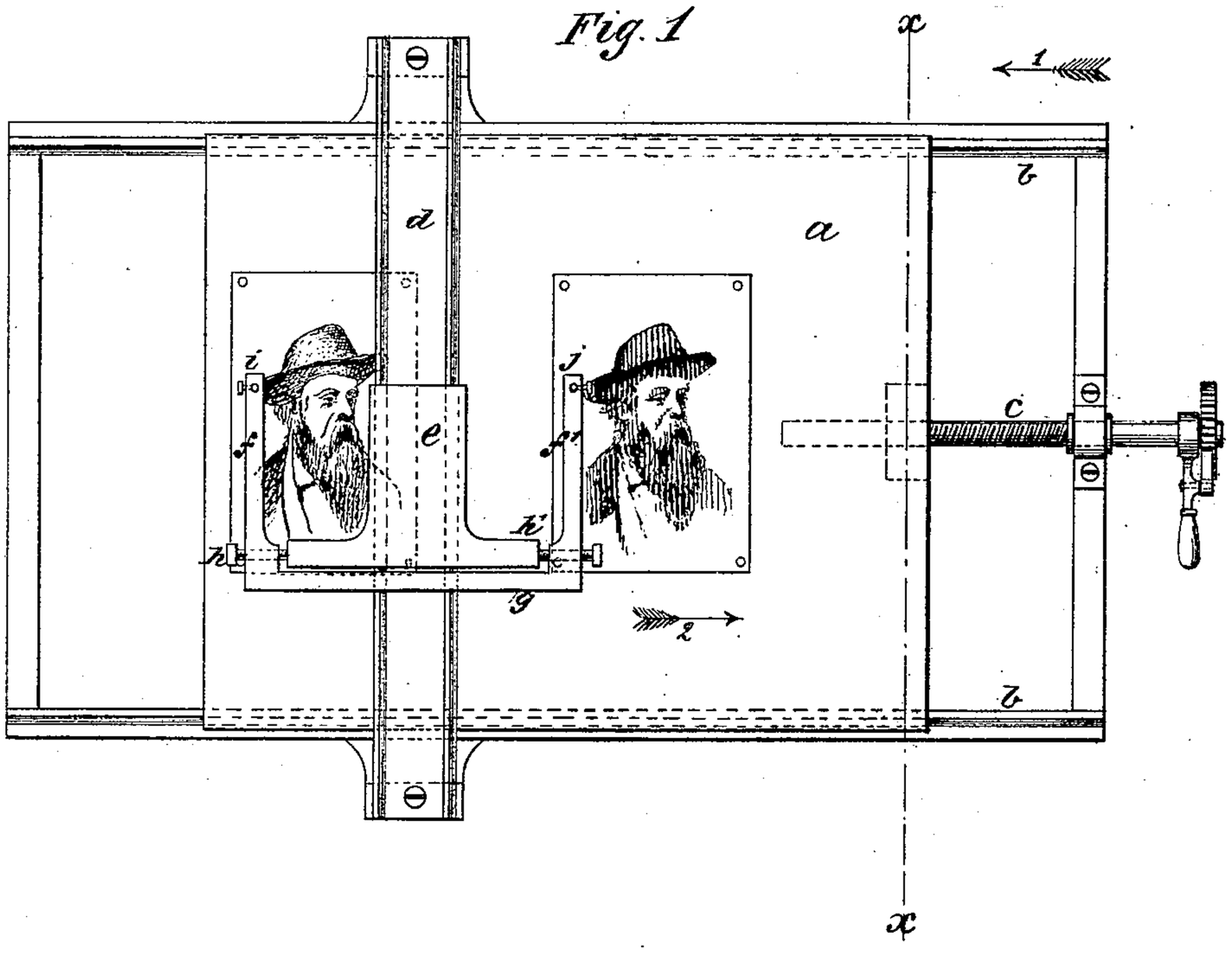
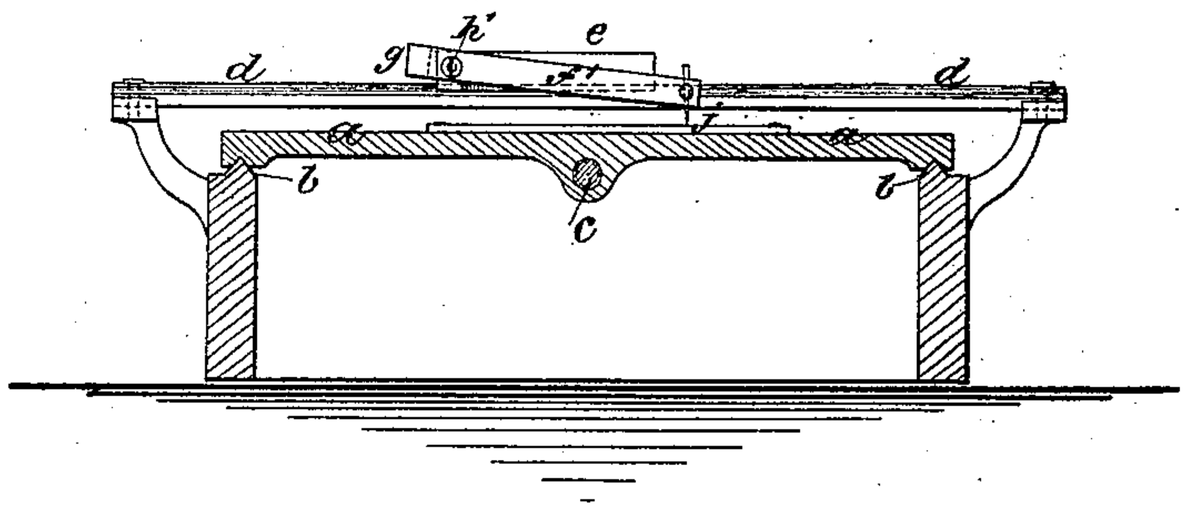


Fig. 2



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ALFRED JONES, OF YONKERS, NEW YORK.

PROCESS OF PRODUCING ENGRAVED PLATES.

SPECIFICATION forming part of Letters Patent No. 241,021, dated May 3, 1881.

Application filed October 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, ALFRED JONES, a citizen of the United States, residing in the city of Yonkers, county of Westchester, and State of New York, have invented certain new and useful Improvements in the Process of Producing Engraved Plates; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to the art of producing plates from the negatives of photographs, which plates shall be engraved and capable of use in typographic presses, and so as to give, along with the letter-press block, impressions as fine as that produced by the slow process of ordinary copper or steel plate engraving, and plates also capable of use in the ordinary plate-press.

It consists in the process of preparing plates from photographic negatives by first taking a relief-film from the negative and then engraving such plate from the relief-film, for the purpose of printing therefrom either on a typographic press or on a plate-press.

I will proceed to describe how my improvements may be practiced and the process by which such improved plates may be made.

I commence with a negative on glass of the subject I wish to engrave, which negative I place upon a leveling-stand and flow over it the following solution, namely: gelatine, quantity sufficient, adding thereto as much cold water as the gelatine will absorb. I then place the vessel containing this solution in water warm enough to liquefy, and add one-tenth the quantity of a saturated solution of bichromate of potash, adding loaf-sugar, one ounce to about two ounces of dry gelatine. Then I filter the whole through flannel and pour it onto the negative on the leveling-stand to the thickness of a silver half-dollar. When this film becomes dry and hard I expose it with the glass side to the light for about thirty or forty minutes, clear daylight. After exposure I place the negative with the film on it in cold water. The film softens and swells up in the parts not acted upon by the light. A cast in plaster or other material can be taken in this condition. Then I immerse the film in warm water, rocking the dish so as to gently flow the water backward and forward, the effect of which is to dissolve the gelatine in those parts of the film that the opaque parts of the negative picture has shielded from the action of the light, resulting in an exact counterpart of the original, excepting that the surface is in higher or lower relief, corresponding to the opaque and transparent parts of the negative and to the darks and lights of a print from that negative. The film is then left to dry, and when dry is ready for use. It is now ready for the second step of my process, and in this stage I use a machine similar to an engraver's ruling-machine for making parallel lines on a flat plate.

In the drawings, Figure 1 is a plan view of such a machine, and Fig. 2 is a cross-section taken in the line *x x* of Fig. 1.

This machine consists of a bed-plate, *a*, made to slide on ways *b b*, and is moved on these ways minute distances by means of a screw-lever, *c*. Across this bed-plate, attached to the frame containing the ways, is a bridge, *d*. On this bridge a carriage, *e*, is attached, and slides back and forth thereon. This carriage has attached to it two arms, *f f'*, fixed to the cross-bar *g*, and moving simultaneously up and down on the same center, *h h'*. One of these arms carries a hard and smooth-pointed tracer, *i*. The other holds a cutting-tool or graver, *j*. These two arms are adjustable, so that when the tracing-point is made to rest on the copy the cutting-tool will touch the plate to be engraved. If this carriage, with the tool resting on the bed-plate, be moved along the bar, the arm of this tool will mark a line on the bed-plate. If this bed-plate be moved on its ways by the screw or lever *c* a minute distance, a second line is made by the tool. This frequently repeated makes a series of parallel lines to the extent of the machine's capacity. These lines, however, will only be of the same thickness from end to end, but may be closer together or wider apart, as desired. This is virtually the well-known process of steel or copper plate engraving.

On the bed-plate of this machine I place, underneath the arm *f*, my copy or pattern in relief, and alongside of it and underneath the arm *f'* the plate to be engraved. It may be of wax or soft metal or other suitable material—that is, it should be of metal softer than the

copy, and the surface should be made smooth and flat. The copy and the plate to be engraved are adjusted by means of screws to correspond exactly to one another with regard to height and situation on the bed-plate. If the carriage be now moved on the bridge with the tracing-point *i* resting on the copy or relief-plate, the tracer will rise and fall correspondingly with the elevations and depressions of the copy. As the tracer rises and falls it communicates the same quantity of motion to the cutting-tool, making a deeper and thicker line or a finer and more delicate one, according to the heights and depressions of such copy—that is to say, making the cut lines darker or lighter, corresponding to the darker or lighter parts of the subject from which the relief-film was taken. After a line has been cut, the bed-plate is moved in the direction of arrow by the screw, carrying with it both the copy and the plate to be engraved, and another line is then made, and so on until the entire surface of the copy is gone over.

If the plate engraved is of wax or similar material, I get an electrotype from it for printing purposes.

Other forms of machine may be used instead of that shown in Figs. 1 and 2, well known to those skilled in the art.

In the machine the arms holding the tracing-point and the cutting-tool may be placed in a bar which is in one and the same straight line, so that when the tracing-point is in a depression the cutting-tool will cease to act on, and when on an elevation of the copy the cutting-tool will cut into, the plate to be engraved. Thus the reverse of the copy is produced, from which an electrotype-plate can be obtained for printing, or the plate can be used alone in a plate-press.

I claim—

The process of preparing a printing-plate from a photographic negative by first producing a relief-film from the negative and then engraving such plate, by means of a pantograph or equivalent device, direct from such relief-film, for the purpose of printing either with the typographic press or with the plate-press, substantially as described.

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