

(No Model.)

W. P. SMITH.

PROCESS OF PRODUCING AND COATING PATTERNS.

No. 567,694.

Patented Sept. 15, 1896.

Fig. 1.

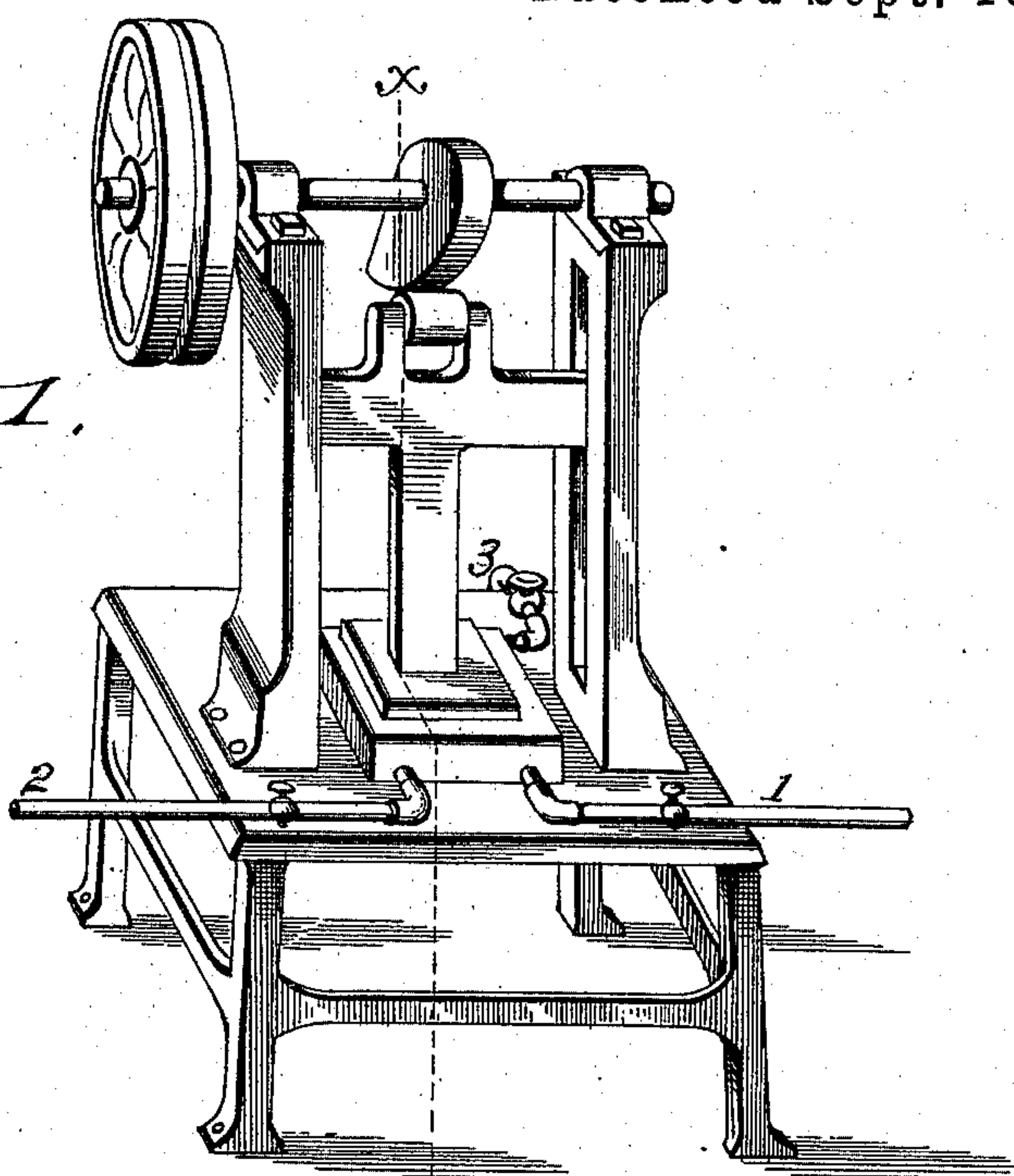


Fig. 2.

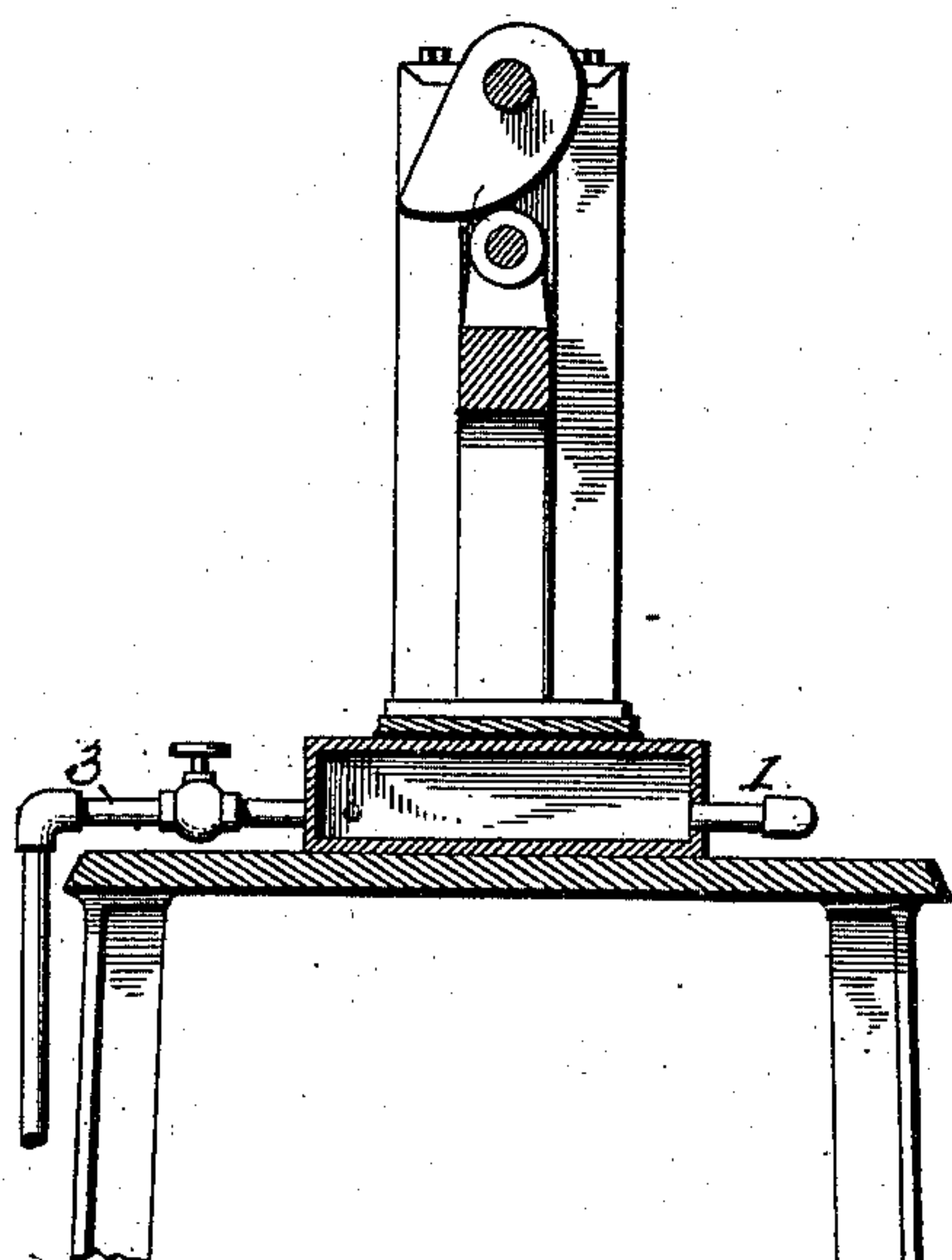
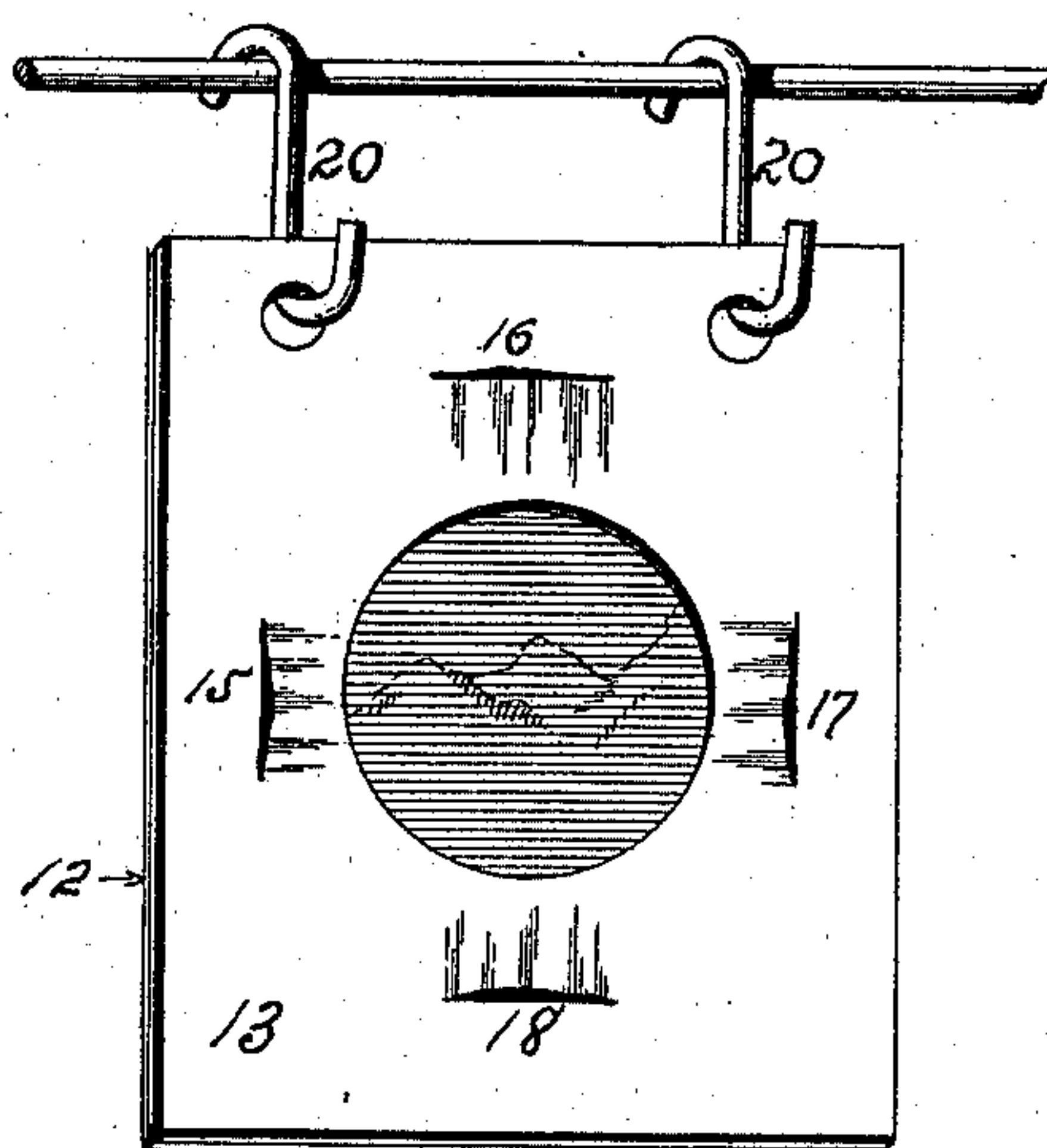


Fig. 3.



Witnesses
"H. L. Seiden."
Chapman & Fowler.

Inventor
William P. Smith
by J. Walter Fowler
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM P. SMITH, OF ALBANY, NEW YORK.

PROCESS OF PRODUCING AND COATING PATTERNS.

SPECIFICATION forming part of Letters Patent No. 567,694, dated September 15, 1896.

Application filed April 28, 1896. Serial No. 589,466. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM P. SMITH, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Processes of Producing Patterns and Coating Them; 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 appertains to make and use the same.

My invention relates to a process of producing a pattern and coating it, for instance, coating a non-conducting substance, such as hard rubber or vulcanite, by depositing upon the surface thereof metallic nickel, for the reproduction of half-tones, woodcuts, engravings, or sound-records; and my invention consists of the process which I shall hereinafter fully describe and claim.

In the accompanying drawings, I illustrate a form of apparatus suitable for carrying out my process, and in which—

Figure 1 represents a perspective view of a press in which the pattern is made and chilled while the impression is still on. Fig. 2 is a vertical sectional view of the same on line *xx* of Fig. 1. Fig. 3 is an enlarged view of a wax case and mold, showing suspending devices.

In many of the processes now in vogue for the reproduction in wax of fine engravings or sound records it has been found that there is a loss from the sharpness of the original by molding the same in wax and depositing a shell of metal, say copper, by a current of electricity produced by a dynamo or other source of electricity. By my process I overcome this defect and am enabled to deposit nickel on the non-conducting substance and obtain an exact facsimile of the design or subject-matter, with all the fineness and sharpness of lines, dots, and impressions that are found in the original; at the same time the nickel forms a hard matrixel, from which copies may be readily obtained with great nicety.

In carrying out my invention I take a sheet of suitable material, for instance, hard rubber or vulcanite, and place it in a press, to which steam or hot water is admitted through a pipe 1 for the purpose of rendering the

hard rubber soft and pliable. While the hard rubber is in a heated condition I take the engraving, woodcut, sound record, or other form and press it face downward upon the hard rubber, whereby the latter readily takes the impress of the former. The machine is then chilled by cutting off the flow of steam or hot water and discharging what remains in the press through a pipe 3 and opening pipe 2, and admitting cold water to the press, this admission of cold water occurring while the impression is still on the mold of hard rubber, in order that any contraction of the hard rubber while chilling may take place while the impression is still on. After the hard rubber has fully cooled, it is removed from the press and placed on a metal case 12, coated with wax or paraffin, a strip of this wax being run around the hard-rubber mold to cause it to be temporarily held to the wax case 13. (See Fig. 3.) Then, by preference, I make one or more, preferably four, connections 15, 16, 17, and 18 just outside of the hard-rubber mold by scraping off portions of the wax to expose the metal backing of the case. When this is done, I make a pasty compound of black lead, or graphite, and alcohol, and I coat the wax case and the outer face of the hard-rubber mold with the same, using for this purpose a fine brush, by means of which the paste is evenly distributed over the face of the said case and mold, the alcohol soon evaporating. The brushing of the black lead upon the surface of the hard-rubber mold and wax case, and the subsequent removal of any remaining particles of the lead, or the polishing of the face in a black-lead machine, will result in the face of the hard-rubber mold and wax case being completely metallized, so that they will serve to take a deposit of metal, such as nickel. The rubber mold and wax case are then washed with a solution composed of one ounce of phosphorus to one quart of pure alcohol, which solution is then washed off with water. When this has been done, they are suspended in a vat containing the well-known nickel solution by means of one or more hooks 20 on one edge of the case engaging a rod or other means constituting the negative pole of the battery, the connection with this pole being through the metallic backing of the case 12. When the case with the hard-

rubber mold adhering to it is suspended in the vat, the current of electricity is turned on and the nickel anode, which is located in the vat opposite the metallized face of the hard-rubber mold, is dissolved and the metallic nickel is deposited in a thin film upon the whole of such surface and of the wax case, the deposit commencing first at the points where the electrical connection is made, namely, where the wax has been removed to expose the metal backing of the case and then gradually creeping over the entire metallized face of the hard-rubber mold, the current returning through the metal backing of the case and the suspending-hooks. When a sufficient amount or shell of nickel has been deposited upon the hard-rubber mold, the latter is removed from the nickel-vat and placed in a copper-vat, and the shell is then completed with copper in the usual manner, producing a shell of nickel with a copper backing to give it stiffness. When the shell has been removed, it will be found that all of the fine lines, dots, and other marks or impressions will be found exactly reproduced in nickel and with all the sharpness that is characteristic of the original; at the same time the nickel is much harder and durable than copper and many other metals which have been used for deposit upon other substances.

The purpose of using a wash of phosphorus and alcohol is, essentially, to wet or dampen every particle of the face of the mold and wax case, so that when the case and mold are suspended in the vat there will be a total absence of air-cells in the bases of the depressions, and the nickel will be deposited uniformly and at every point, thereby preserving the fine lines, dots, and depressions of the original copy. I have found by experiment that if the wax case and mold were dipped into the solution without their faces having been first washed with the solution of phosphorus and alcohol, or alcohol alone, which I have also used with success, the depressed portions of the pattern, being dry, would serve to form minute air-cells and that the nickel solution would be prevented from depositing uniformly in said depressions, thereby making an imperfect copy of the original record or half-tone; but when the faces of the wax case and mold are washed with the phosphorus and alcohol solution, or alcohol alone, the whole surface of the case and mold will be rendered damp, so that when the case with its mold is dipped into the vat the solution therein will readily enter

all of the depressed portion of the pattern and drive out any air therein, thereby enabling a uniform deposit on all parts of the mold.

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

1. The process herein described of producing a pattern and coating it, for obtaining a facsimile of a half-tone, woodcut, engraving or sound-record which consists, essentially, in placing the material in a press and rendering it pliable by the action of a heating medium admitted to the press; then impressing the form or design; then admitting a cold medium to the press and quickly chilling the mold while the impression is still on; then metallizing and washing the face of the mold and finally depositing metal thereon.

2. The process herein described of producing, in hard rubber or vulcanite, a facsimile of a half-tone, woodcut, engraving, sound-record &c., which consists, essentially, in placing the material in a press and admitting a heating medium thereto for the purpose of rendering the material pliable; then impressing the form or design; then removing the heating medium and admitting a cold medium to the press for quickly chilling the mold before the impression is relaxed; then removing the pattern thus produced and metallizing the surface thereof; then washing the surface and depositing nickel thereon.

3. The process herein described of producing, in a non-conducting substance, a facsimile of a half-tone, woodcut, engraving, sound-record &c., which consists, in placing the material in a press and admitting a heating medium thereto for the purpose of rendering the material sufficiently pliable to take the impression; then impressing the form or design; then removing the heating medium and admitting a cold medium to the press for quickly chilling the mold while the impression is still on; then removing the mold and metallizing the surface thereof; then washing said surface; then placing the mold in a vat and depositing nickel thereon; then removing the shell and placing it in a vat to receive a metal backing.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM P. SMITH.

Witnesses:

T. WALTER FOWLER,
B. H. LOUCKS.