

(Model.)

2 Sheets—Sheet 1.

A. N. HOPKINS.

JAPANNING METAL SHEETS OR PLATES.

No. 278,707.

Patented June 5, 1883.

Fig. 1.

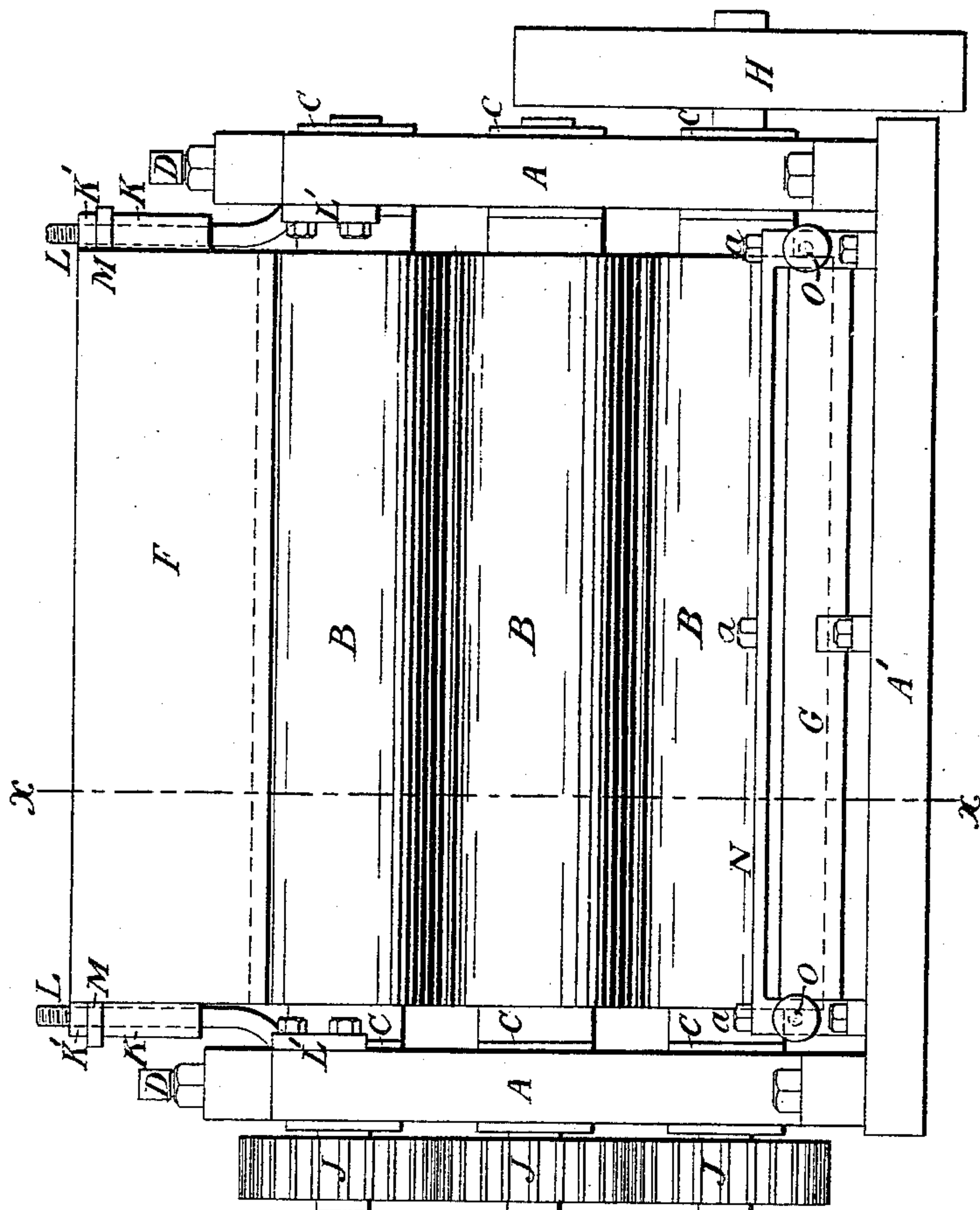
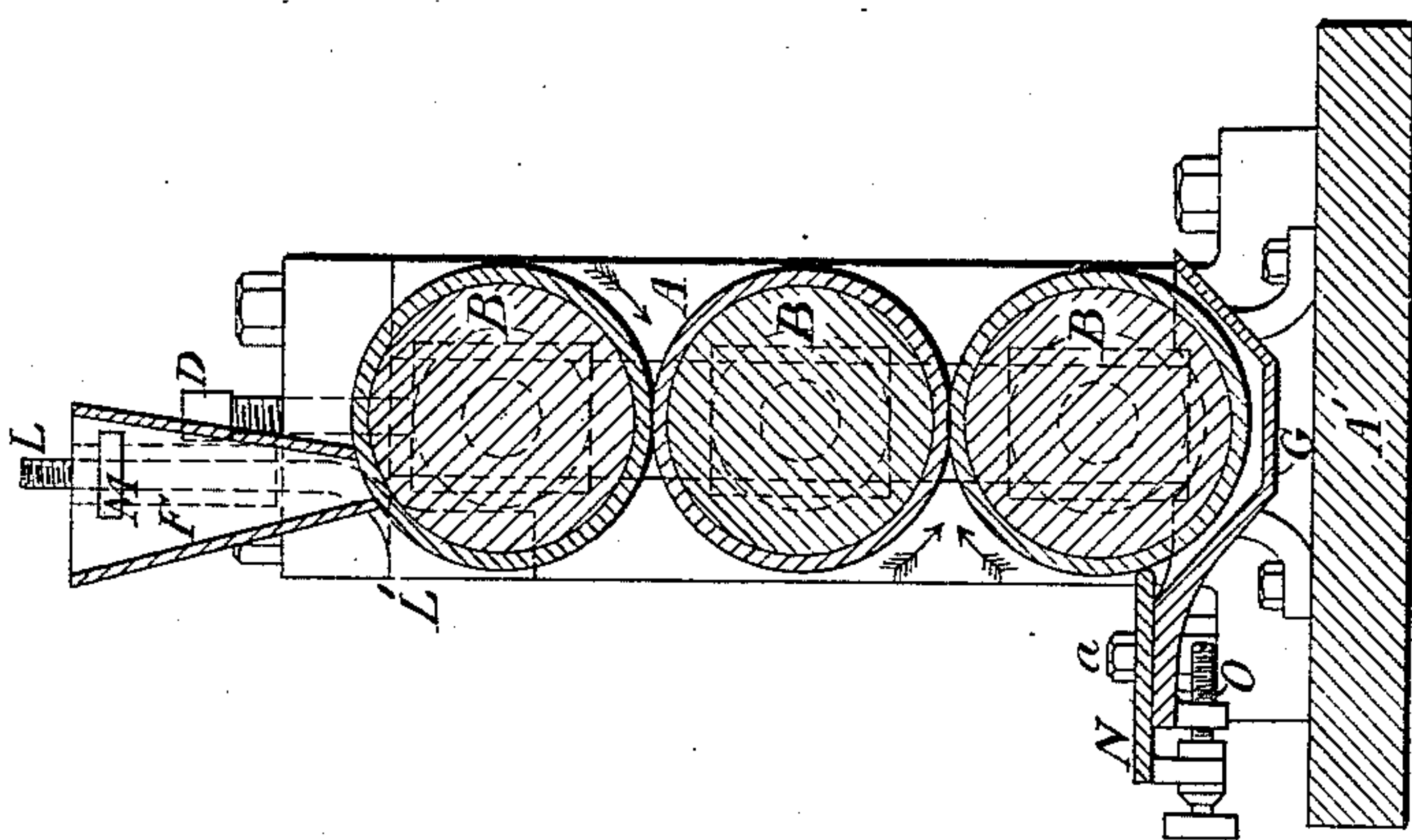


Fig. 2.



WITNESSES:

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INVENTOR:

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By his attorneys

Burke, Fraser & Bonnell

(Model.)

2 Sheets—Sheet 2.

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Fig. 3.

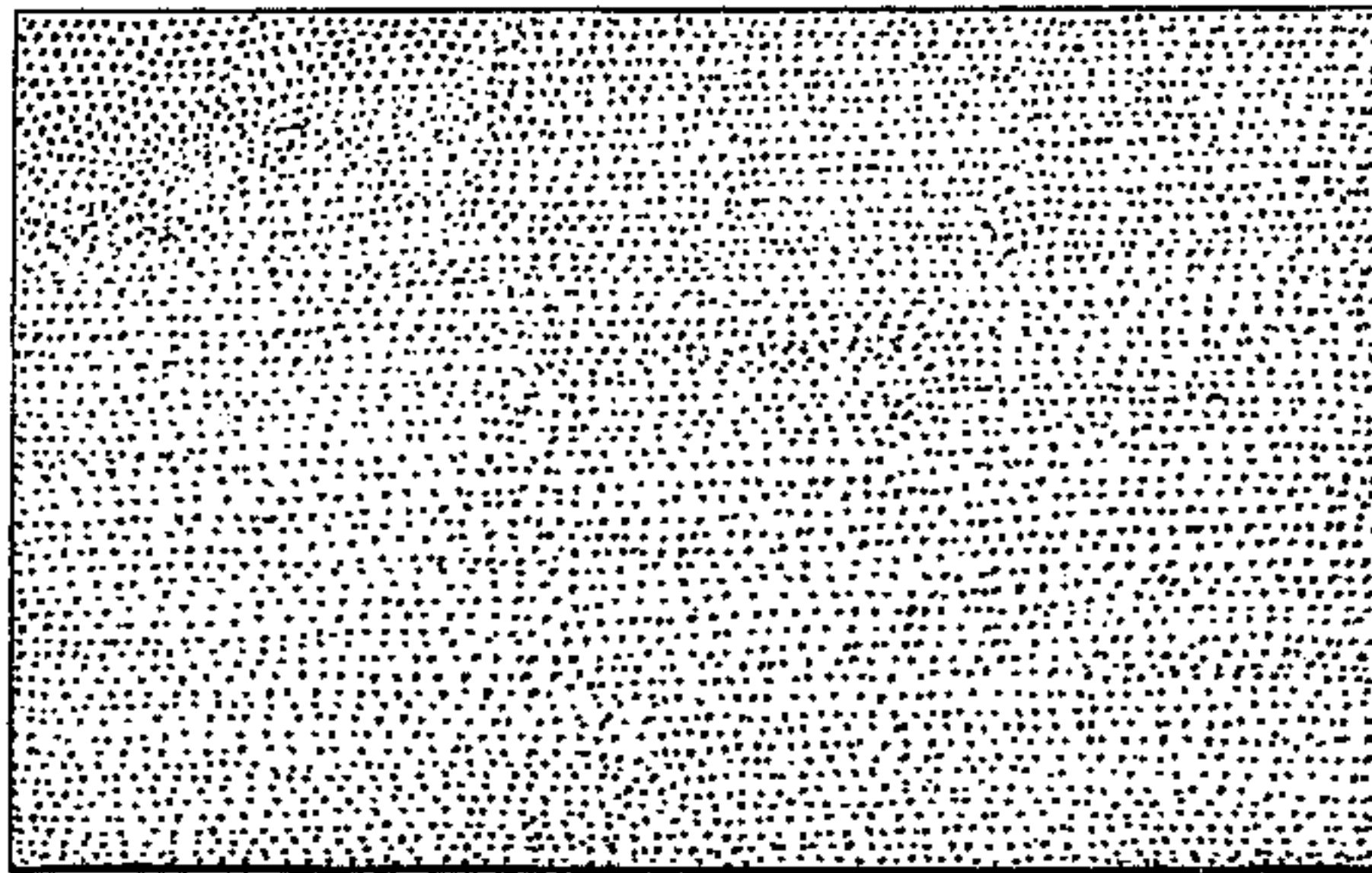


Fig. 4.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

ALFRED N. HOPKINS, OF BIRMINGHAM, ENGLAND.

JAPANNING METAL SHEETS OR PLATES.

SPECIFICATION forming part of Letters Patent No. 278,707, dated June 5, 1883.

Application filed June 9, 1882. (Model.) Patented in England November 29, 1881, No. 5,209.

To all whom it may concern:

Be it known that I, ALFRED NIND HOPKINS, a subject of the Queen of Great Britain, residing in Birmingham, England, have invented certain new and useful Improvements in the Art of Japanning Metal Sheets or Plates and other Articles, of which the following is a specification.

This invention relates to a method of coating the surface of tin-plate (or of articles made therefrom) or other surfaces with japan or other similar coating material which is capable of being set or hardened by heat. Heretofore such plates or articles have been coated by applying the japan to them with a brush, or by dipping them in a bath of japan, after which they have been baked or "stoved" in the well-known manner. Plates or articles so coated present a surface that is smooth to the touch, and when the japan is properly laid on is smooth and uniform and somewhat glossy in appearance.

The object of my invention is to apply to the metal or other surface a coating of a novel and peculiar character, in order that the coated surface shall be more completely disguised than by japanning as heretofore practiced, and the value of the coated article thereby enhanced.

To this end my invention consists in charging the surface of a yielding roller with japan or other equivalent coating material of a thick consistency, passing the roller so charged, under pressure, back and forth repeatedly over the surface to be decorated until the latter is entirely covered with a continuous coating, and finally baking the article so coated, whereby a hardened coating is obtained, which presents a rough granular or pebbled surface, somewhat resembling the surface of certain kinds of leather; and it further consists in a metal plate or sheet or other article which is provided with a hardened coating of this character.

In carrying my process into practice I proceed as follows: I prepare the japan in much the usual manner, mixing with it whatever colors or pigments are desired; but instead of making it so thin or light of body as to be readily laid on with a brush, I make it of greater consistency in order that it shall be somewhat tacky or adhesive. The consist-

ency of the japan may be varied to some extent, according to the character of the coating desired; as whether it is to be thick or thin, and coarsely or finely granulated, the exact consistency in every case being ascertained by experiment.

Instead of japan, any other suitable coating material may be used which possesses the same property of setting or hardening upon the application of heat, and by the term "japan," as used in this specification, I mean either japan or any such other equivalent substance. The japan or other material having been suitably prepared, it is applied to the surface to be coated by means of a roller or rollers, either by hand or machine. The coating-roller has a surface of some elastic or yielding material—such as vulcanized rubber or leather—being formed preferably with a core of wood or metal covered with the yielding covering. For coating irregular or curved surfaces—such as the surfaces of articles made from sheet metal—it is preferable to use a hand-roller. In such case the japan may be spread on a flat plate or stone, over which the roller may be passed in order to charge its surface with the japan, in similar manner to the inking of hand printing-rollers. In this way, or by any other suitable means, the entire surface of the roller that is designed to come in contact with the surface to be decorated is charged with a continuous coating of japan. The plate or article is then firmly held in position, and the roller so charged is rolled, under pressure, backward and forward over its surface, or the portion of its surface which it is desired to decorate, until the latter is entirely coated with a continuous and substantially uniform coating. Owing to the yielding of the surface of the roller, the thick consistency of the japan, and the absence of any sliding or wiping movement, the japan is applied in a rough coating, its surface being granular to the touch and presenting a pebbled or matted appearance. This granulation is due in part to the lifting of minute portions of the japan as the surface of the roller leaves the coated surface, owing to the partial adherence of the japan to the yielding surface of the roller, and also in part to the roughness or porosity of the surface of the roller. If the granulation is desired to be coarse or strongly marked, a

roller with a pitted or deeply-granulated surface should be used.

When it is desired to coat tin-plate or other metal sheets according to my invention it is preferable to employ a machine in which there should be two or more rollers automatically supplied with the japan, between which the plate may be passed. The accompanying drawings illustrate a machine well adapted for this purpose. Figure 1 is a front elevation thereof, and Fig. 2 is a vertical transverse section cut in the plane of the line $x x$.

A A is the frame, and A' its bed-plate. B B are the rollers, which are formed with wooden or iron cores covered with vulcanized india-rubber to a thickness of about three-eighths of an inch. The journals of these rollers turn in blocks C C, which slide vertically in the frame A A, and the upper blocks are forced downward by screws D D, by which the rollers can be pressed together with any desired pressure. Three rollers are shown, the upper and lower ones of which receive the charge of japan from troughs F and G. The trough F is bottomless, and is set just over the upper roller, being adjusted vertically by screws L L to regulate the thickness of the coating imparted by it to the roller. The trough G is fixed beneath the lower roller, so that the latter is partially immersed in the japan, and is provided with a scraping-plate, N, adjusted by screws O O to regulate the thickness of the coating taken up by the roller.

The metal plates are coated by being passed back and forth through the machine—say first between the bottom and middle rollers, and then back between the middle and upper rollers, and so on until the desired coating is attained. When only one side of the plates is to be coated they may be passed through the rollers in pairs, or each rolled in contact with a blank or dummy plate to keep the intended plain side from coming in contact with the rollers. After the tin-plate or other article has received its coating it is then baked or stoved in the usual manner, preferably at a high temperature.

Figs. 3 and 4 of the accompanying drawings are designed to illustrate the finished plate

coated according to my invention. Fig. 3 is a plan of a fragment of plate, showing the coated side; and Fig. 4 is a magnified cross-section of the plate, the black portion denoting the coating and the shaded portion the plate.

The japan coating applied according to my invention is of uniform thickness, and is not liable to peel or crack off. In fact, a plate of thin metal may be bent to sharp angles without cracking or impairing its coating. The appearance of the coating is such as to entirely disguise the character of the surface to which it is applied, so that materials coated according to my invention may be put to many uses for which their appearance has heretofore unfitted them.

I am aware that paint and varnish have been applied to surfaces of wood and metal by means of yielding rollers; but I am not aware that thick japan has ever been applied to any surface by yielding rollers in such a manner as to leave a pebbled or granulated coating.

I claim as my invention—

1. The improvement in the art of japanning, which consists in employing japan, or other similar coating material capable of being set or hardened by heat, of a thick consistency, as described, charging therewith the surface of a yielding roller, passing the roller so charged, under pressure, back and forth repeatedly over the surface to be decorated until the latter is entirely covered with a continuous coating, and finally baking the article so coated, substantially as set forth, whereby the coating is given a pebbled or granular texture.

2. A metal plate or sheet or other article the surface of which is composed of a continuous coating of hardened japan, said coating being of a rough surface, presenting a pebbled or granular texture, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALFRED NIND HOPKINS.

Witnesses:

CHARLES WRIGHT HASKIN,
DANIEL BARRON BRIGHTWELL.