

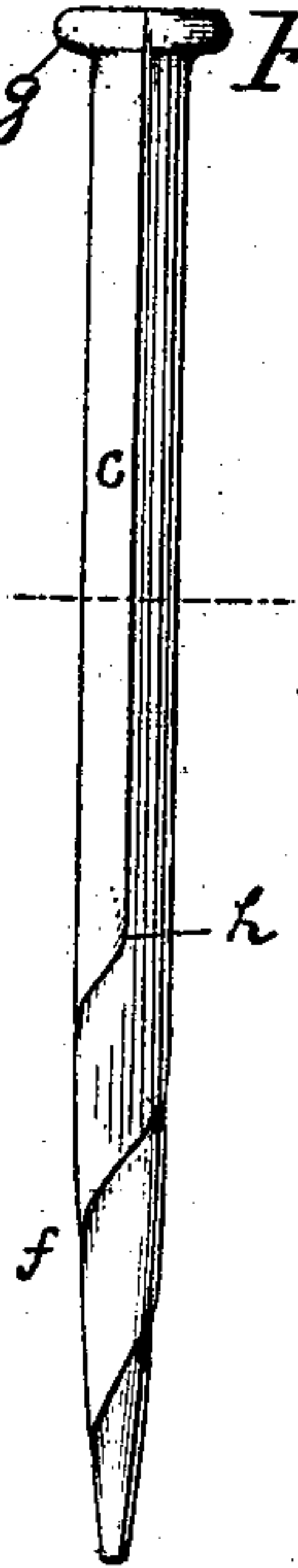
(No Model.)

G. H. PERKINS.  
NAIL.

No. 273,385.

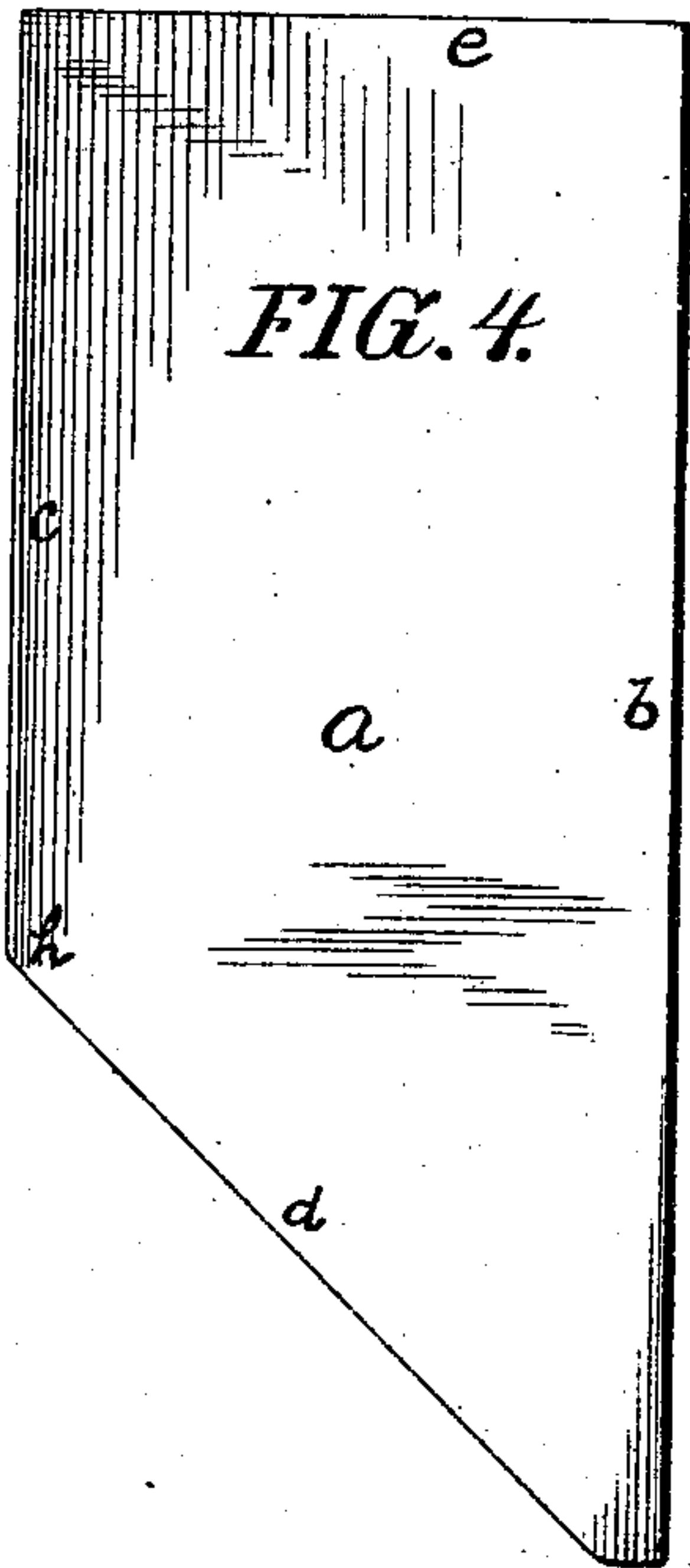
Patented Mar. 6, 1883.

*FIG. 1.*



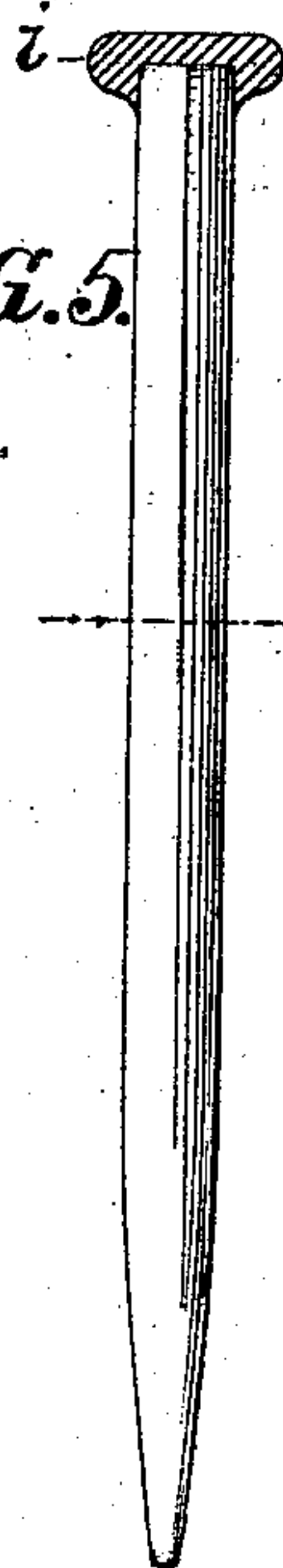
*FIG. 3.*

*FIG. 2.*

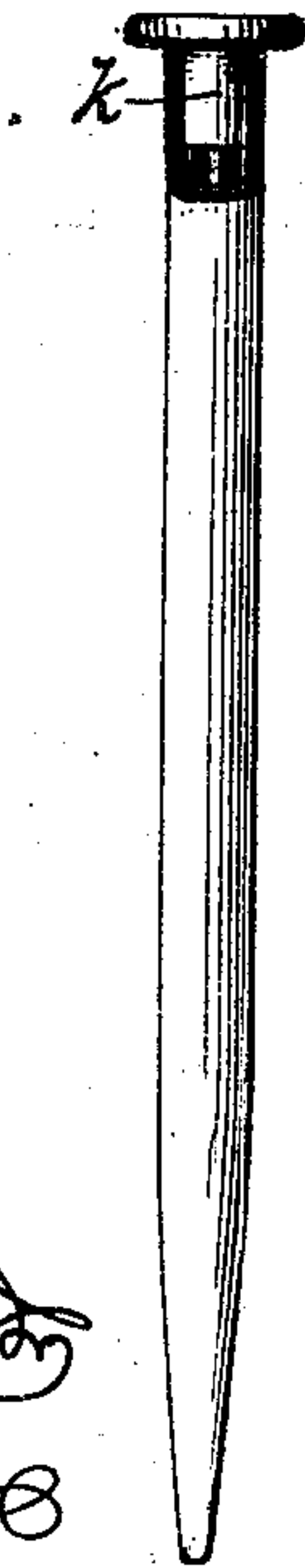


*FIG. 4.*

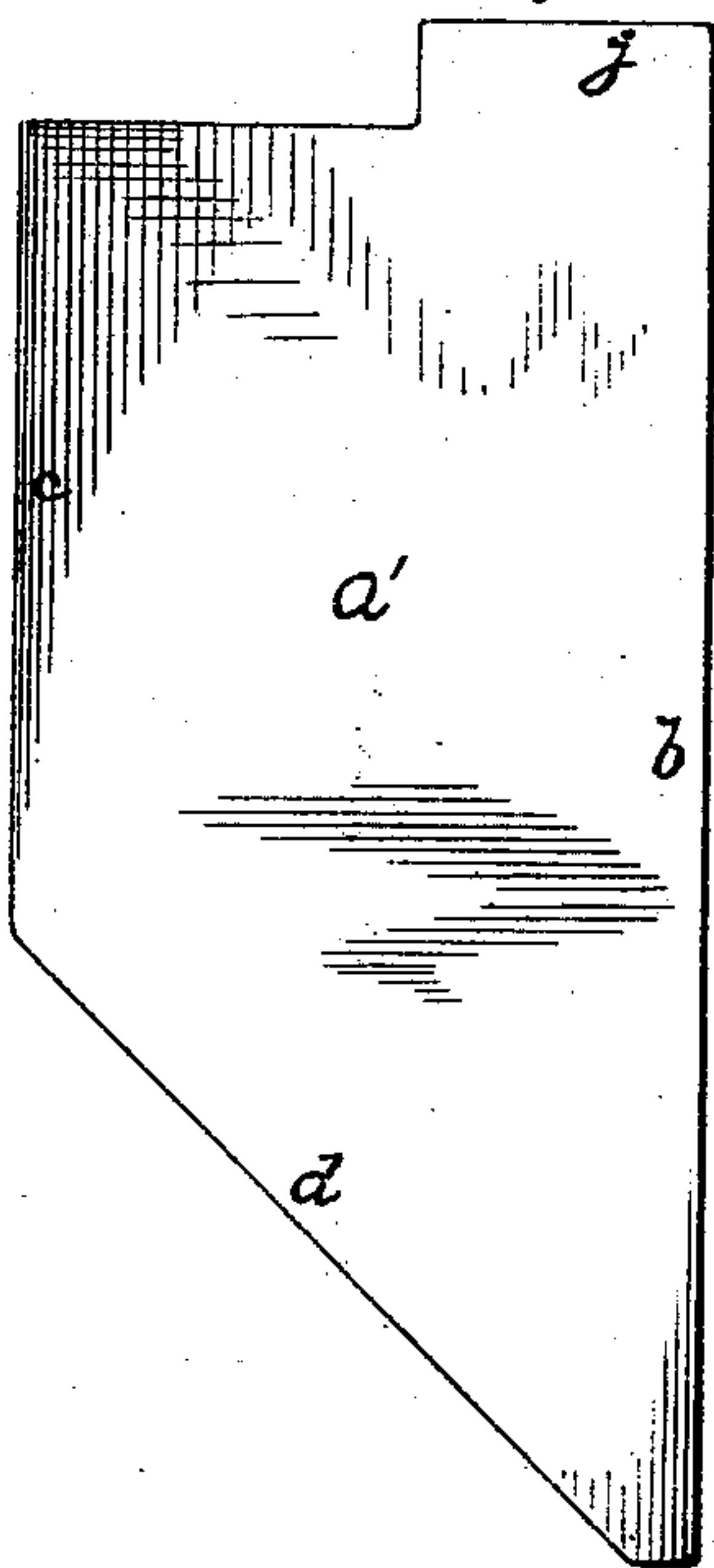
*FIG. 5.*



*FIG. 6.*



*FIG. 7.*



*FIG. 8.*



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# UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

## NAIL.

SPECIFICATION forming part of Letters Patent No. 273,385, dated March 6, 1883.

Application filed August 1, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. PERKINS, of Philadelphia, Pennsylvania, have invented certain Improvements in Sheet-Metal Nails, of which the following is a specification.

The object of my invention is the utilization of waste or scrap sheet metal of the various thinner varieties for the manufacture of useful articles, such as tacks, nails, brads, spikes, and the like.

Although primarily I contemplate utilizing only waste material, yet the employment of sheet metal not being waste is, as will be understood, effectual for the carrying out of my invention.

Heretofore nails and kindred products have been made by stamping heavy-weight metal in sheets to the form required. Heretofore, also, these products have been made by forging, compressing, or otherwise compacting or consolidating metal in heavy sheets into a solid nail or kindred product of a predetermined exterior configuration. Heretofore, also, sheet metal has been formed into hollow nails by grooving, ridging, or corrugating it longitudinally, so as to stiffen it and form it into a hollow nail in the form of a longitudinally-corrugated tube. Heretofore, finally, a blank of sheet-iron has been rolled to form a hollow tubular body, which could be driven into material to be united, and which to such extent constituted a nail.

I have discovered that light sheet metal—such as the tin of commerce or light brass or copper in sheets—can be utilized for the formation of practically solid nails, spikes, brads, and kindred articles of cylindrical exterior configuration and of thickness in excess of that of the sheet employed by rolling up or otherwise working or manipulating such sheet metal until it forms, under such action, a nail or kindred product of the desired form.

As will be readily understood, many methods of rolling, working, or manipulating the sheet metal may be resorted to for the practical carrying out or embodiment of the idea of the employment of thin sheet metal *per se* for the making of practically solid nails, in which idea the gist of this invention lies. That method, however, which presents itself as the

most simple, and probably as the cheapest, is that of rolling a previously-shaped blank of the desired sheet metal upon itself until such rolled sheet metal has assumed the desired form.

In the shaping of the blank, as mechanics, to whom this specification is addressed, will readily understand, great latitude of outline must be allowed, as according to the outline of the blank is the exterior configuration of the resultant nail. After the body of the nail has been formed by rolling the metal previously shaped to the desired blank upon itself, the head, when head is desired, may be formed much as heads upon solid nails are formed—that is to say, by swaging or crushing the substance of the rolled metal until it forms a solid or approximately solid head of the desired shape, or by applying the head as a separate member, separately formed in any manner and of any material desired, to the rolled body.

In the accompanying drawings I have represented certain convenient forms of nails embodying my invention. I do not, however, regard those represented as the only forms which will effectuate the idea, but simply depict them as convenient forms simply and practically embodying the broad idea.

In the drawings, Figure 1 represents, in side elevation, a nail formed by the rolling of a blank, *a*, of tin or other light sheet metal of the form represented in Fig. 4 upon itself, commencing at the right-hand side, *b*, of said blank and rolling on the line of the right-hand edge toward the left-hand side, *c*. This action of rolling, if the metal be tightly closed or coiled upon itself, will produce a nail of the form represented in Fig. 1, the cross-section of which through its thickest part is substantially that represented in Fig. 3, or that of a helical coil. The oblique face of the blank, which is represented by the letter *d*, serves to produce, when the blank is tightly rolled upon itself, the tapered lower extremity, *f*, which is represented in Fig. 1. The head *g* upon the nail of Fig. 1 is made by swaging, forging, compressing, or otherwise compacting the metal of the upper extremity, *e*, of the rolled blank. The heading may be accomplished by any con-



venient mechanism or in any way which convenience of manufacture may dictate. If, on the contrary, it is desired that there should be no head strictly as such, the upper portion of the rolled blank will be found sufficiently rigid to present a resisting surface to the hammer in the driving of the nail without the necessity of forming a head proper.

In Fig. 2 is represented in side elevation a nail also formed from the blank of Fig. 4, but by rolling the blank from its shorter side, which is lettered *c*, on the line of the edge thereof, toward the longer side, which is lettered *b*, and by compressing or crushing together the lower portion of the rolled blank until it forms a point or tapered extremity to the body of the nail. The above action of pointing becomes readily possible by virtue of the formation of the blank represented, the angular face *d* insuring the rolling of the blank, when rolled in the above manner, with a hollow interior at or below that point of the rolled nail which corresponds to the lower point of the blank marked *h*. The head upon this nail of Fig. 2 is formed in any manner similar to that in which the head of Fig. 1 is formed.

In Fig. 5 is represented in side elevation such a nail as is represented in Fig. 2, the body of which is formed in the same way, but the head of which, however, is not formed of the substance of the blank of which the nail proper is formed, but is a head, *i*, previously formed, if desired, of the shape shown in Fig. 5, applied upon the upper extremity of the rolled body, and when applied secured in place by soldering, compression, heat, or other means.

Fig. 3, which is a cross-section taken on any one of the dotted lines of Figs. 1, 2, and 5, represents the appearance of the rolled metal of either nail if sectioned, on either dotted line.

In Fig. 7 I have represented in plan view a slightly-modified form of the blank of Fig. 4, in which there is notched out of the upper part thereof a portion of metal, so that the blank has the appearance of the blank of Fig. 4, with the addition of an upward extension, so appearing, which I have indicated by the letter *j*. In other respects the blank is similar to that of Fig. 4. When this latter blank is rolled, commencing with the edge *c* on the line thereof toward its edge *b*, there is formed a nail whose exterior is that represented in elevation in Fig. 6, and the tapered extremity of which is formed by drawing or compression in the manner heretofore described in connection with a nail represented in Fig. 2. The upper portion, however, of this nail of Fig. 6 presents a cylindric form cavity, which is occasioned by the wrapping of the extension *j*. Below this cavity the nail is solid, as are the nails of Figs. 1, 2, and 5. Into this cylindric form cavity can, if desired, be introduced a head, *k*, of the character represented in Fig. 6, which is in form a stopper provided with a flat crown and a cylindrical extension adapted to fit within the cavity in the rolled nail. When the head

is placed in position, it may be secured by any convenient method, as by soldering, heat and pressure, sweating, riveting, or other method.

In Fig. 10 is represented in cross-section a nail formed by the wrapping of a sheet-metal blank of the desired formation upon itself, partially in helical and partially in angular form. This figure represents a type merely of an irregular form of wrapping not strictly circular or helical, but combining both constructions, and another construction the characteristic of which is that it has angular turns.

In the matter of the formation of the blank and its shaping to a desired outline, of the rolling of said blank upon itself to form the body proper of the nail, of the tapering or pointing and heading of the nail, when such actions are desired, I address myself to the intelligence of mechanics working under the invention, and desire to distinctly state that I do not limit myself to the forms shown and described as the only forms adapted for carrying into effect the invention, nor to the methods which I have described as the only methods whereby such carrying out of the invention can be accomplished; but I regard the most important feature of the invention to lie in the discovery that a practically solid nail, spike, brad, tack, or device to unite material by being driven into such material can be formed wholly, if desired, of light sheet metal not in itself of substance or thickness sufficient to form a nail; and, further, that by such discovery an important outlet for waste material, when waste is at hand, is developed and a new use or industry to which light sheet metal as a product may be applied.

In practice, rolling and compression, whether the rolling be in helical, circular, or angular form in cross-section, will be sufficient to retain the rolled metal in its rolled relation; but it is clearly obvious that the lapped or meeting edges of the metal may be secured by sweating, soldering, galvanizing, cementing, indenting, or other means.

As heretofore stated, a head may or may not be formed, and when formed may be of the substance of the rolled metal or be applied as a separate member previously formed from separate material, as convenience of manufacture may dictate. The number of times that the metal may be rolled upon itself will depend upon the thickness of the sheet metal, the desired thickness of the nail, and upon similar considerations.

I am aware that a strip of ordinary flat bar or plate iron beveled at the ends has been coiled to form a hollow or tubular rivet, and to such construction I lay no claim, as the gist of my invention resides in coiling a blank tightly upon itself, so that there results a compacted or practically solid nail, which is not adapted to be expanded at its driving end in the manner of a rivet, but which is essentially of solid substance, and not hollow or tubular.

Having thus described my invention, I claim



and desire to secure by Letters Patent of the United States—

1. As a new article of manufacture, a nail, spike, brad, or kindred article the body of  
5 which consists of sheet metal tightly rolled upon itself so as to be essentially solid.

2. As a new article of manufacture, a nail, spike, brad, or kindred article the body of which consists of sheet metal tightly rolled

upon itself so as to be essentially solid, and 10 which is provided with a solid head.

In testimony whereof I have hereunto signed my name this 28th day of July, A. D. 1881.

GEORGE H. PERKINS.

In presence of—

J. BONSALE TAYLOR,  
WM. C. STRAWBRIDGE.