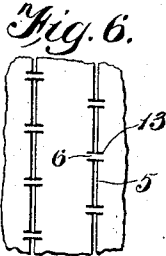
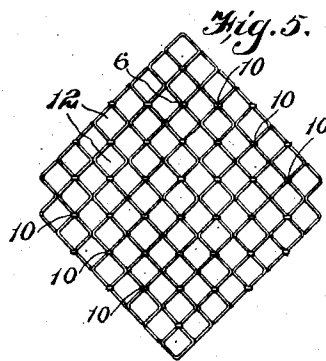
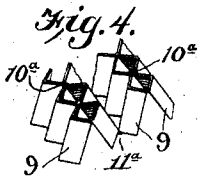
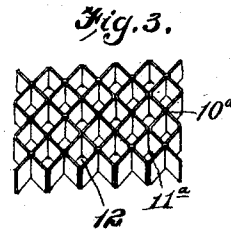
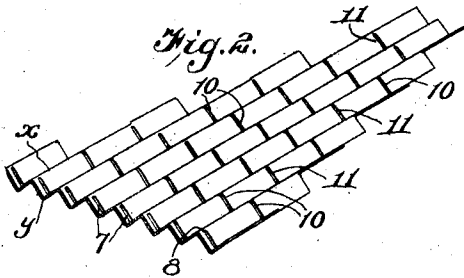
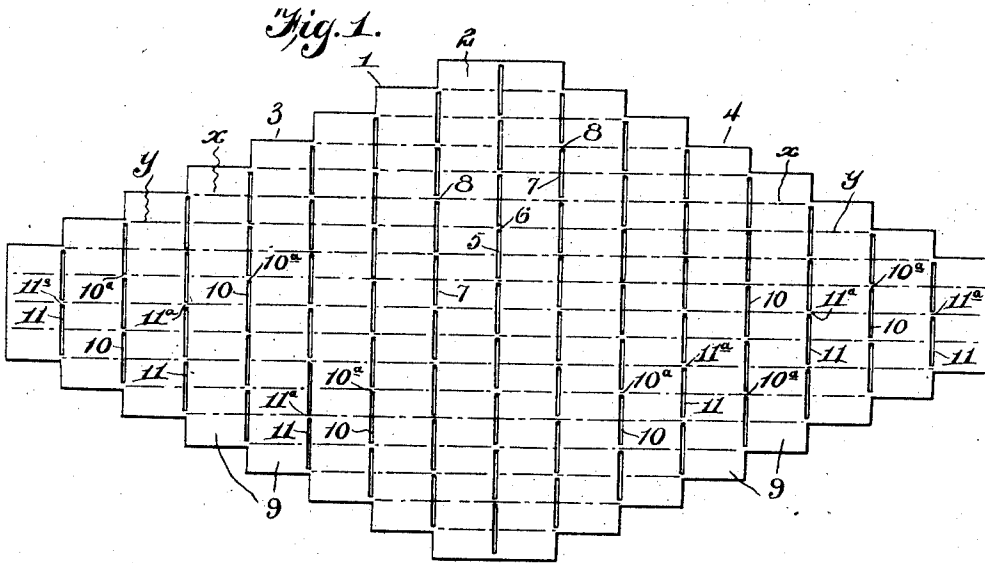


No. 878,999

PATENTED FEB. 11, 1908.

M. W. PITNER.
SHEET METAL GAUZE OR GRATING.
APPLICATION FILED MAY 29, 1907.



Witnesses

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SHEET-METAL GAUZE OR GRATING.

No. 878,999.

Specification of Letters Patent.

Patented Feb. 11, 1908.

Application filed May 29, 1907. Serial No. 376,315.

To all whom it may concern:

Be it known that I, MARION W. PITNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Sheet-Metal Gauzes or Gratings, of which the following is a specification.

This invention relates to improvements in sheet-metal structures, comprehending particularly an improvement in gratings, gauzes, screens and other like metallic structures of the open work or cellular type, and a novel method of manufacturing the same.

The primary object of the invention is to provide a sheet-metal structure of this type which may be conveniently made from a single piece or blank of sheet-metal punched up into a desired form, and which will present maximum strength and durability and a capacity of the parts thereof to mutually reinforce and support each other, whereby liability of the sagging of the article when supported only at its marginal edges will be obviated.

A further object of the invention is to provide a cellular sheet-metal structure of this character which is especially adapted for use as a burner-gauze for incandescent gas and vapor burners and lamps, and which, when used in this connection, will effectually withstand the heat of the flame without liability of warping or becoming distorted under extremes of temperature, and which is designed to give the greatest capacity for free flow of the gas and strength for the amount and weight of metal used.

A still further object is to provide a novel method of manufacturing different articles embodying the structural features of the invention.

In the accompanying drawing illustrating the invention, Figure 1 is a plan view of one form of blank for making an article, such as a burner gauze, constructed in accordance with the invention. Fig. 2 is a perspective transverse sectional view illustrating the first step in the formation of the article from the blank. Fig. 3 is a perspective longitudinal sectional view in plan of a portion of the completed article. Fig. 4 is a similar view, on an enlarged scale, of several of the folds or corrugated portions of the completed article, showing the same spread apart to better illustrate the construction. Fig. 5 is a plan view of a burner gauze or cellular grating, exemplifying the completed structure of the

invention. Figs. 6 and 7 are views illustrating a modification.

Referring to the drawings, the numeral 1 designates a form of blank from which a completed article, such as a burner-gauze, is made, which blank is formed by the action of a suitable die from sheet-metal. The blank may vary in form according to the type of article to be produced, but, in the present disclosure, comprises a body portion 2 and duplicate or corresponding end portions 3 and 4. The body portion 2 is of oblong rectangular form and provided with a central longitudinal row of spaced slits or slots 5 separated by intervening short sections of the metal forming necks 6, and is provided along its marginal side edges with similar rows of slits or slots 7 separated by intervening necks 8, the said rows or series of slits 7 being arranged at the points of junction of the side edges of the body portion with the inner edges of the end sections 3 and 4.

Each end section is composed of a plurality of portions 9 which have a stepped formation or relation, or progressively diminish in width on a regular scale from the inner to the outer end of said end section, so that in general outline the end section tapers in an outward direction to impart a desired formation to the completed article. The portions 9 of the end section conform in shape to the body 2 of the blank and are separated by or provided along their lines of junction with transverse rows of slits or slots 10 and 11, spaced, as in the manner described with relation to the rows or slits or slots 5 and 7, so that the slits of the row 10 are separated by intervening necks 10^a and the slits of the row 11 by corresponding necks 11^a. It will be observed that the slits 5 are so arranged relative to the slits 7 that the necks 8 of said slits 7 lie longitudinally of the blank in line with each other and intermediately between the necks 6 of the row 5, or on lines crossing the centers of the slits 5, by which a break-joint arrangement of the rows of slits is produced. The slits 10 and 11 are correspondingly arranged with relation to the slits 7 and to each other, so that from the center of the blank outwardly to the terminals of the respective end portions 3 and 4 the slits of one row will be arranged on lines centrally intersecting the necks of the slits of adjacent rows. This peculiar arrangement of the slits provides a means by which the blank may be creased or corrugated and folded in the man-

ner hereinafter described to produce a cellular article in which the respective parts or portions thereof are integrally bound by the necks, but it will be understood that the specific form of blank shown is immaterial from a broad aspect and that its shape or outline may be varied, as desired, to suit the outline, form or shape of the completed article which is to be produced therefrom.

In the formation of a burner-gauze or other like form of article from the shape of blank disclosed, the blank is first creased or corrugated longitudinally in any preferred manner, as by passing it between corrugating rolls thus giving the blank a channeled formation in cross section. In this operation, the blank is folded as described along the dotted lines $x-x$ which, throughout the major portion of the length of the blank, bisect or extend centrally across the slits 5 and 10 and along the lines of the necks 8 and 11^a, and also on the dotted lines $y-y$ along the longitudinal registering rows of necks 6 and 10^a and across the slits 7 and 11 midway of the length thereof so that at the completion of the corrugating operation, the portions of the blank along the lines $x-x$ will form the highest points or angles of the corrugations, while the portions along the lines $y-y$ will form the lowest points or angles of the corrugations, as will be readily understood by reference to Fig. 2.

After the blank has been longitudinally corrugated in the manner described, it is folded transversely along the longitudinal junction lines of the sections of the body portion and end portions to produce a transverse channeled or corrugated formation. This is conveniently effected along the weakened lines formed by the rows of slits or slots by bending the sections of the body portion, formed by the longitudinal row of slits 5, downward along the line of said slits so that the slitted portion will form an intersecting or connecting angle, and the respective sections and end portions 3 and 4 are correspondingly and successively folded upwardly and downwardly in alternation, so that the slitted portions throughout from the central slitted portion 5 will alternately and successively form the highest and lowest points or angles of the transverse corrugations. As a result of this mode of corrugating the blank both longitudinally and transversely, the parts of the metal of the sections lying between the rows of slits will be bent laterally in opposite direction to form the opposing substantially V-shaped walls of rows of substantially triangular cells or openings 12, as indicated clearly in Fig. 3, 4 and 5, which walls are integrally connected at their abutting angles, alternately at top and bottom, by ties or bonds formed by the bent neck portions 6, 8, 10^a and 11^a. Hence a sheet-metal grating, screen or like open work struc-

ture will be produced in which the walls of the cells or openings will abut squarely against one another and be integrally bound together, by which the parts are adapted to have a reinforcing action to withstand any strain falling upon them, which will be transmitted from one to the other and equally absorbed and taken up, thus providing an article of maximum strength and durability.

When the blank shown in Fig. 1 is folded in the manner described, it will be contracted and its form changed to produce a gauze of the general rectangular form shown in Fig. 5; hence it will be seen that the construction set forth enables a gauze of any desired geometrical marginal outline to be made from a blank of a different geometrical marginal outline, the shape of the blank being varied to suit the specific shape of gauze to be produced.

Various types of screens, gratings and similar open work metallic structures of different sizes, and for different purposes may be manufactured in accordance with the principles of the invention, and I therefore do not limit the articles produced thereby to any particular use. As an example of a mode of employing a structure of this type, it may be stated that burner screens or gauzes of fine coarse mesh for use upon the burners of incandescent gas or vapor lamps may be conveniently manufactured in the manner described and will be found superior to the ordinary gauze, in that the reinforcing or self-supporting action of the parts of my improved construction better adapts the screen to withstand extreme variations of temperature without liability of warping or sagging. Furthermore, this type of construction and self-supporting action allows the gauze or screen to be supported solely at its marginal edges without liability of sagging at the center and the depth of the meshes or openings 12 materially retards or prevents liability of disintegration or warping of the thin metal from the heat of the flame, as the metal is kept comparatively cool by contact with the flowing streams of the combustible mixture. The construction of the screen also provides for the convenient application of a socket for a mantle support in upright burners or gas spreading members which may be fitted into one of the angular cells or meshes 12.

In the embodiment of the invention disclosed, in Figs. 6 and 7, a slight modification is shown in which cross slits 13 are formed at the ends of the longitudinal slits to divide the neck portions from the ends of the edge walls of the longitudinal slits, so that in the operation of corrugating the blank for the production of the complete article, the neck portions bend freely to lie respectively below and above the planes of the upper and lower angles of the channels or corrugation, thus obviating projection of the necks above and

below the top and bottom surfaces of the screen as is unavoidable with the construction disclosed in Figs. 1 to 5 inclusive. These and other modifications may be made within the spirit and scope of the invention as defined by the appended claims.

The construction and method of manufacture herein set forth will be found of particular value in the construction of gratings, screens and other like open work articles customarily formed of wire or metallic bars, necessarily heavier, inasmuch as any type of sheet-metal, ornamental or otherwise, may be employed with superior advantage, owing to the increase in strength and durability afforded by the self-supporting action of the parts resulting from the mode of forming and combining them.

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

1. A screen fabric formed from a blank of sheet metal provided with rows of slits, the slits of each row being separated by intervening necks of materially less length than the lengths of the slits, said blank being corrugated on intersecting lines at right angles to each other to bend and spread the walls of the slits to produce rows of angular cells or meshes, said slits, necks and corrugations being so relatively arranged and adapted through the materially different relative lengths of the slits and necks to dispose the cells or meshes with their angles abutting and connected alternately at the top and bottom of the corrugations by the short necks.

2. A screen fabric formed from a blank of sheet metal having parallel rows of slits arranged to break joint with each other, the slits of each row being separated by short intervening necks with the necks of one row arranged intermediately between the ends of the slits of the adjacent row or rows, said blank being corrugated by folding it alternately in opposite directions along the lines of the slits and also corrugated by folding it alternately in opposite directions at right angles to the lines of the slits, centrally across certain of said rows of slits and along the lines of the necks between the other rows of slits, whereby the blank is contracted in both directions and the walls of the slits spread to provide rows of angular cells or meshes, the lengths of the necks being materially less than the lengths of the slits, whereby in the formation of the cells by the spreading of the slits the corner angles of the rows of cells are brought into abutting relation and connected alternately at the top and bottom of the corrugations by the short bent necks.

3. A screen fabric formed from a blank of sheet metal having parallel rows of slits separated by intervening necks, the necks of

each row being disposed on lines between the necks of adjacent rows, said slits being provided at their ends with cross-slits, the blank being bent on lines transversely of the first-named rows of slits to spread the walls thereof and folded along the lines of said slits, whereby the spread walls of the slits upon the adjacent walls of the corrugations formed by so bending and folding the blank abut and provide rows of angular cells or passages having their angles abutting and connected, alternately at the top and bottom of the corrugations, by the bent necks, the cross-slits permitting the necks to lie above and below the opposite faces of the fabric.

4. A screen fabric formed from a single piece of sheet material having rows of parallel slits with the ends of the slits of each row approximating and separated by intervening necks of a length materially less than the lengths of the slits, the slits of the respective rows being arranged in determined break-joint relation so that the necks of one row lie centrally between the ends of the slits of the adjacent row or rows, said blank being corrugated in one direction along the lines of the slits and corrugated in the reverse direction centrally across certain of the rows of slits and along the lines of the necks between other rows of slits, whereby the walls of the slits are spread to provide angular cells or openings arranged by the relatively short length of the necks to abut at their angles and having the latter alternately connected at the points and bases of the corrugations by said necks.

5. A gauze fabric formed from a blank of sheet material having a body portion and tapering end portions, said body portion and end portions being provided with transverse parallel rows of slits separated by intervening necks of a length materially less than the lengths of the slits, the slits of one row being arranged on lines between the slits of adjacent rows, and the blank being transversely corrugated along the lines of the slits and longitudinally corrugated along the central lines of certain of the rows of slits and along the lines of the necks between the other rows of slits, whereby the blank is contracted in both directions and the walls of the slits spread to provide angular cells arranged by the relatively short length of the necks to abut at their angles and to be connected at the points of the corrugations by the necks, thus producing a screen of maximum strength and of a different edge outline from the blank.

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

MARION W. PITNER.

Witnesses:

JOHN L. FLETCHER,
CHATTIN BRADWAY.