

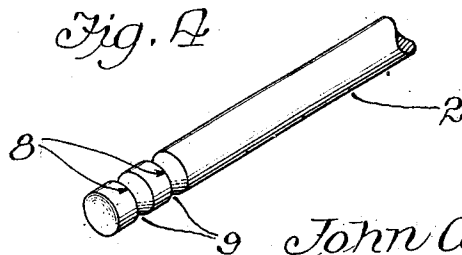
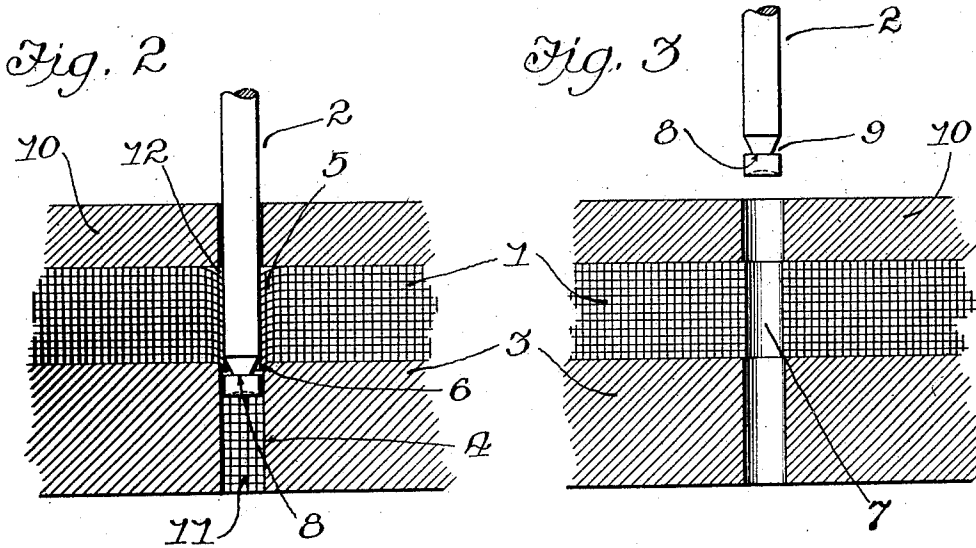
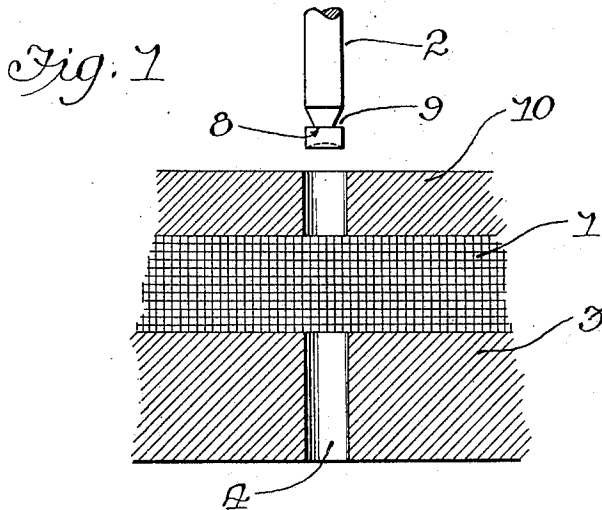
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METHOD OF AND MEANS FOR PERFORATING WIRE GAUZE FABRIC AND THE LIKE.

APPLICATION FILED JULY 10, 1919.

1,368,233.

Patented Feb. 15, 1921.



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UNITED STATES PATENT OFFICE.

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METHOD OF AND MEANS FOR PERFORATING WIRE-GAUZE FABRIC AND THE LIKE.

1,368,233.

Specification of Letters Patent.

Patented Feb. 15, 1921.

Application filed July 10, 1919. Serial No. 309,942.

To all whom it may concern:

Be it known that I, JOHN A. S. BECKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Methods of and Means for Perforating Wire-Gauze Fabric and the like, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings forming a part of this specification.

My invention relates to a method of and means for perforating wire gauze fabric and the like.

In his pending application, Serial Number 301,675 filed June 4, 1919, Oliver E. Becker has disclosed a wire gauze brush for electrical machinery, the various layers of which brush are connected by perforating the brush fabric and inserting localized connections or holding rivets therein.

While my invention is particularly useful in connection with the perforation of such materials as the brush fabric employed in connection with the above application, I do not intend to limit the invention to such use or purpose only.

I have found that in perforating bodies of gauze fabric or similar material with the various types of perforating tools or punches now on the market that the material adjacent the upper face of the body is shifted downwardly upon movement of the perforating tool therethrough, leaving a depression about the upper edge of the perforation thus provided. The material adjacent the lower face of the body is spread or forced out of the plane of the body leaving a bur or roughness about the lower edge of the opening after the punch or perforating tool has been withdrawn. In the event that the perforated brush body is to be mounted in a guide or terminal piece these irregularities—depressions and burs—upon the opposite faces of the brush body not only prevent proper contact between the brush body and the terminal piece or guide but present an unfinished appearing job. Thus, a considerable practical difficulty is frequently encountered, to effectively overcome which has heretofore been impossible even upon the application of pressure to the brush body upon completion of the perforating operation.

It is an aim of my invention to provide a

novel principle of and means for perforating a body of wire gauze fabric or similar material without leaving such irregularities upon the opposite faces thereof:

It is a further aim of my invention to provide a novel perforating tool or punch for carrying out this novel principle of my invention in a simple and inexpensive manner.

In accordance with the teachings of my invention I have provided for perforating a body of gauze fabric or the like and removing such irregularities as are formed upon the opposite faces thereof by a single perforating operation.

In order to explain to those skilled in the art the manner in which the principle of my invention is to be applied and to explain a specific embodiment of the invention, I shall describe in connection with the accompanying drawings the perforation of a body of wire gauze fabric.

Figures 1, 2 and 3 are fragmentary sectional views showing various stages in the perforation of a body of gauze fabric in accordance with the teachings of my invention; and

Fig. 4 shows an alternative form of perforating tool or punch for carrying out my invention.

Referring first to Fig. 1 of the drawings, the work or body of material 1, to be perforated, is interposed between the usual die 3 and clamping piece 10. The die 3 is provided with the usual aperture 4 for co-operation with the perforating tool or punch 2. The clamping piece 10 which is clamped to the die 3 in any suitable manner as at its opposite ends, in addition to clamping the body of material securely in place serves to strip the fabric from the perforating tool 2 with the withdrawal of the perforating tool subsequent to the perforating operation.

Thereafter the body of material—wire gauze fabric in this particular instance—is operated upon by the perforating tool or punch 2, which perforating tool or punch is preferably secured in the end of the usual punch press plunger as well understood by those skilled in the art. The operating pressure for forcing the punch 2 into co-operation with the aperture 4, provided in the die 3, can be applied in any desired manner.

The body of material 1, is thus perforated

by forcing the perforating tool there-through, such operation punching a slug of gauze fabric 11 out of the body of material to provide an aperture 7.

5 It is to be noted that the gauze fabric surrounding the perforation or opening 7, thus provided, particularly the longitudinal wires of the fabric, are forced or shifted downwardly as the punch 2 descends there-through, as shown at 5 in Fig. 2. Con-
10 sequently a considerable depression 12 is formed upon the upper surface of the material and a considerable bur or roughness 6 is formed upon the lower surface of the gauze fabric about the opening 7. Hereto-
15 fore in the art these irregularities 6 and 12 have been left after the perforating tool or punch has been withdrawn. The removal of these irregularities has heretofore pre-
20 sented considerable difficulty, not only requiring another operation, but being frequently impossible to effectively accomplish.

I have provided whereby the gauze fabric 5 forced or shifted downwardly when
25 the perforating tool or punch 2 descends therethrough, is shifted back into the normal plane of the body of fabric 1 upon the withdrawal of the punch, leaving the upper surface of the fabric without irregularities
30 and the lower edge of the opening or perforation 7 without a bur or roughness and as clean cut as the upper edge thereof, as shown in Fig. 3. This is accomplished in the specific embodiment of my invention
35 disclosed by providing an annular groove 9 in the perforating tool 2 adjacent its lower or perforating end. This annular groove 9 provides an annular shoulder 8 which an-
40 nular shoulder 8 during the upward movement of the perforating tool 2 engages such gauze fabric as has been forced or shifted downwardly out of the plane of the brush to form the bur 6 and depression 12, shifting
45 this gauze fabric back into the normal plane of the body 1 and leaving the upper and lower faces of the gauze fabric without irregularities. Fig. 3 shows the body of gauze fabric 1 subsequent to the perforating operation, and the withdrawal of the per-
50 forating tool 2, all irregularities about the edges of the perforation 7, having been effectively removed. The perforating tool or punch 2 can be provided with a plurality of annular shoulders 8 if so desired, as
55 shown in Fig. 4.

Obviously the perforating tool 2 need not necessarily be of the particular type dis-

closed, this type of perforating tool being shown merely for the purpose of illustration. The novel principles of my invention
60 are equally as applicable in connection with drills or boring tools.

While I have described my invention in connection with the details of a particular embodiment, it is to be understood that this
65 embodiment is merely illustrative and I do not intend thereby to limit the invention to the specific disclosure or precise utility specified, but aim to cover all modifications and adaptations coming within the scope of the
70 invention as set out in the appended claims.

I claim:

1. The method of perforating a material of substantially stiff characteristic and nor-
75 mally tending to form non-pliant depressions and burs around the edges of the perforation, which consists in forcing a punch through the material and opening a hole therein, and then causing positive engage-
80 ment between the burred or depressed edges of the material and the sides of the punch to cause said burred or depressed edges to be bent back when the punch is withdrawn.

2. The method of perforating a body of stiff fibrous material of metallic character-
85 istic which consists in forcing a punch having an annular shoulder through the material and opening a hole and then causing engagement between the ends of the fibers and said annular shoulder to cause the fibers to
90 be bent back when the punch is withdrawn.

3. In combination a punch for opening a hole in a stiff fibrous material normally
95 tending to form non-pliant depressions and burs around the edges of the hole, a die having an aperture for coöperation with said punch, said punch having means for positively engaging the ends of the fibers adja-
100 cent the hole to cause the fibers to be bent back when the punch is withdrawn.

4. A punch for perforating wire gauze or similar material normally tending to form
105 non-pliant depressions and burs around the edges of the perforations, said punch being formed with an annular shoulder above its cutting edge, said annular shoulder func-
110 tioning to positively engage the bent edges of the material around the perforation and to bend these edges back into a normal plane when the punch is withdrawn.

In witness whereof I hereunto subscribe my name this 27th day of June, 1919.

JOHN A. S. BECKER.