

J. F. DOOLITTLE.

PUNCH.

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900,009.

Patented Sept. 29, 1908.

Fig 1

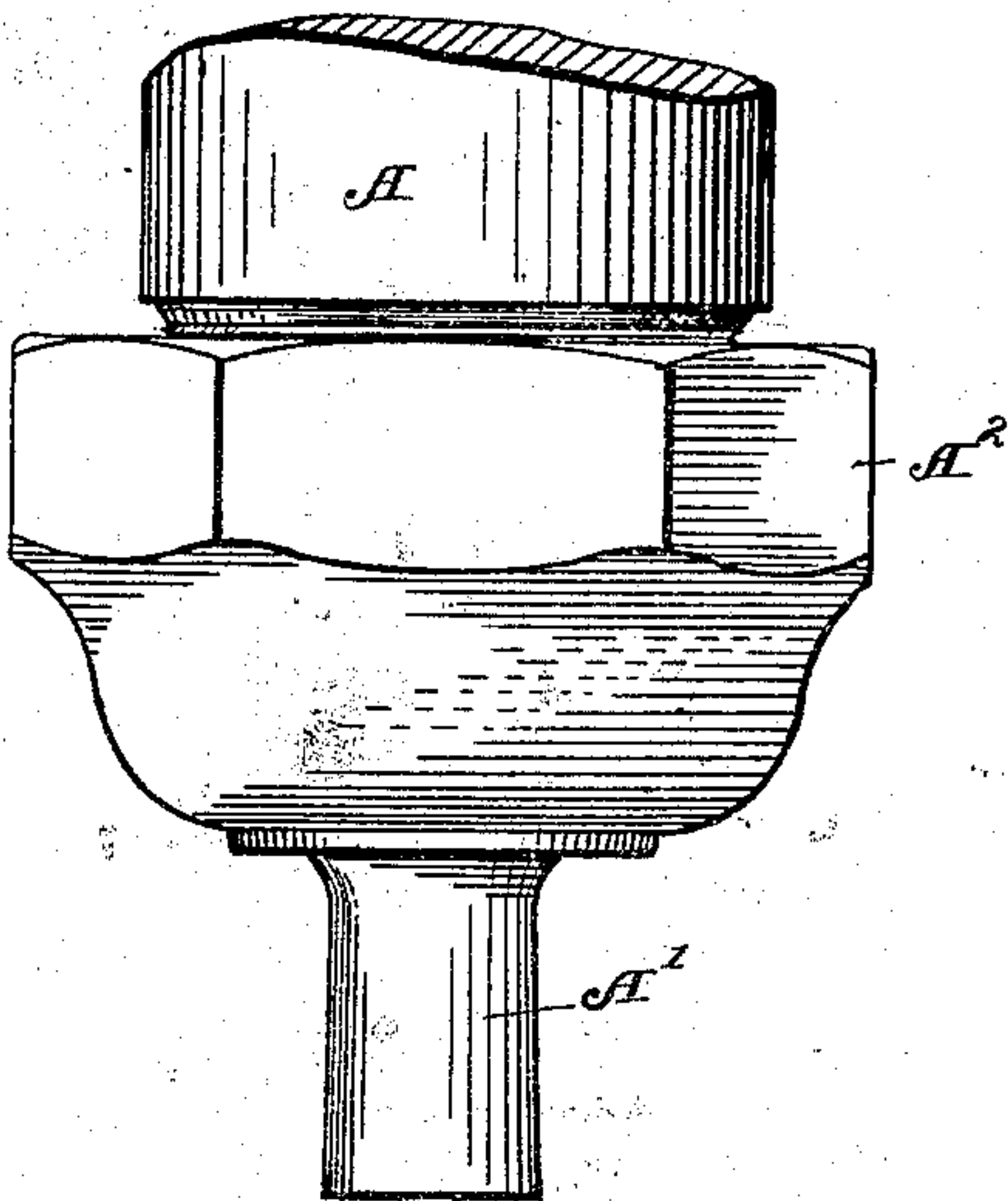


Fig 3

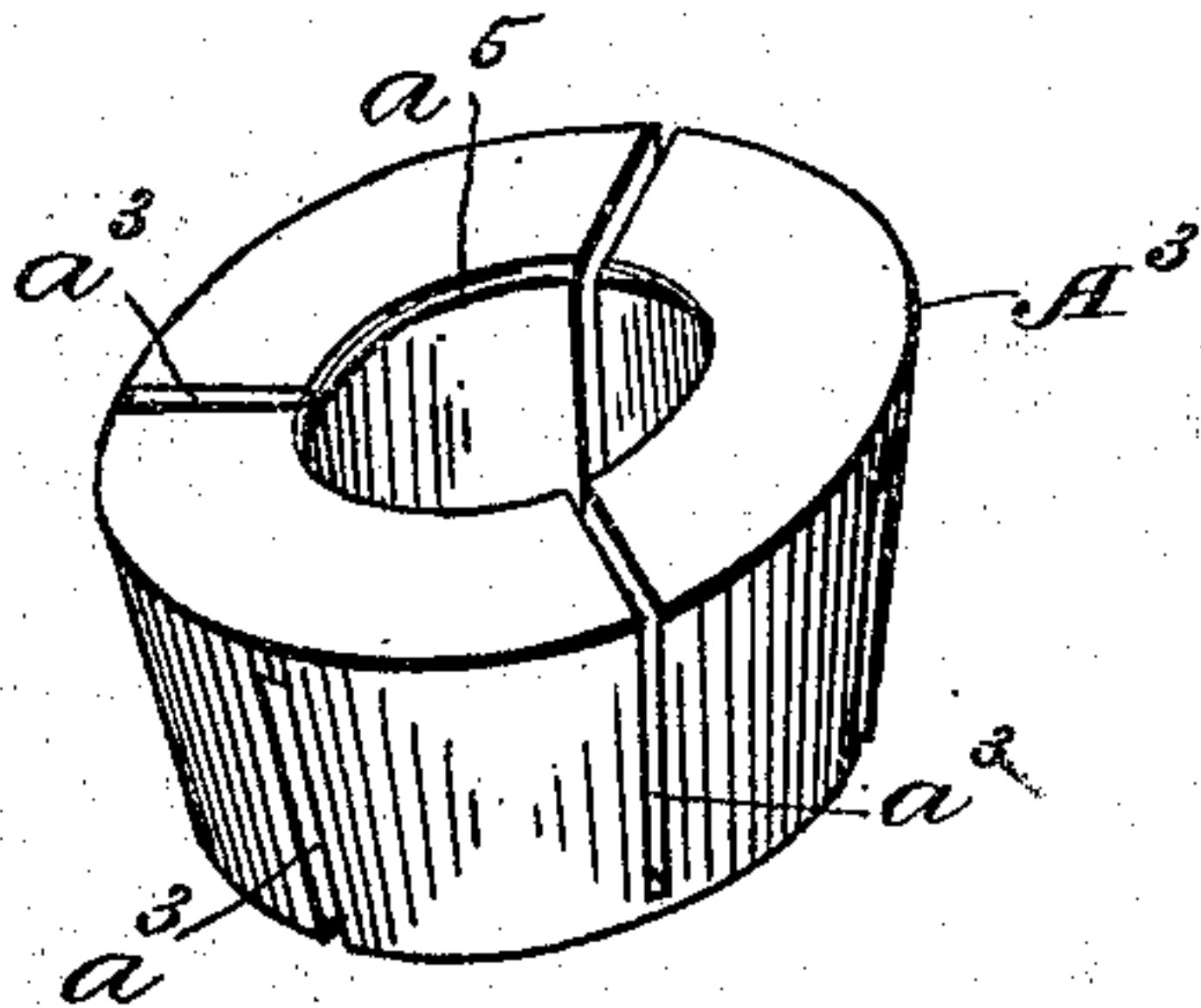


Fig 4

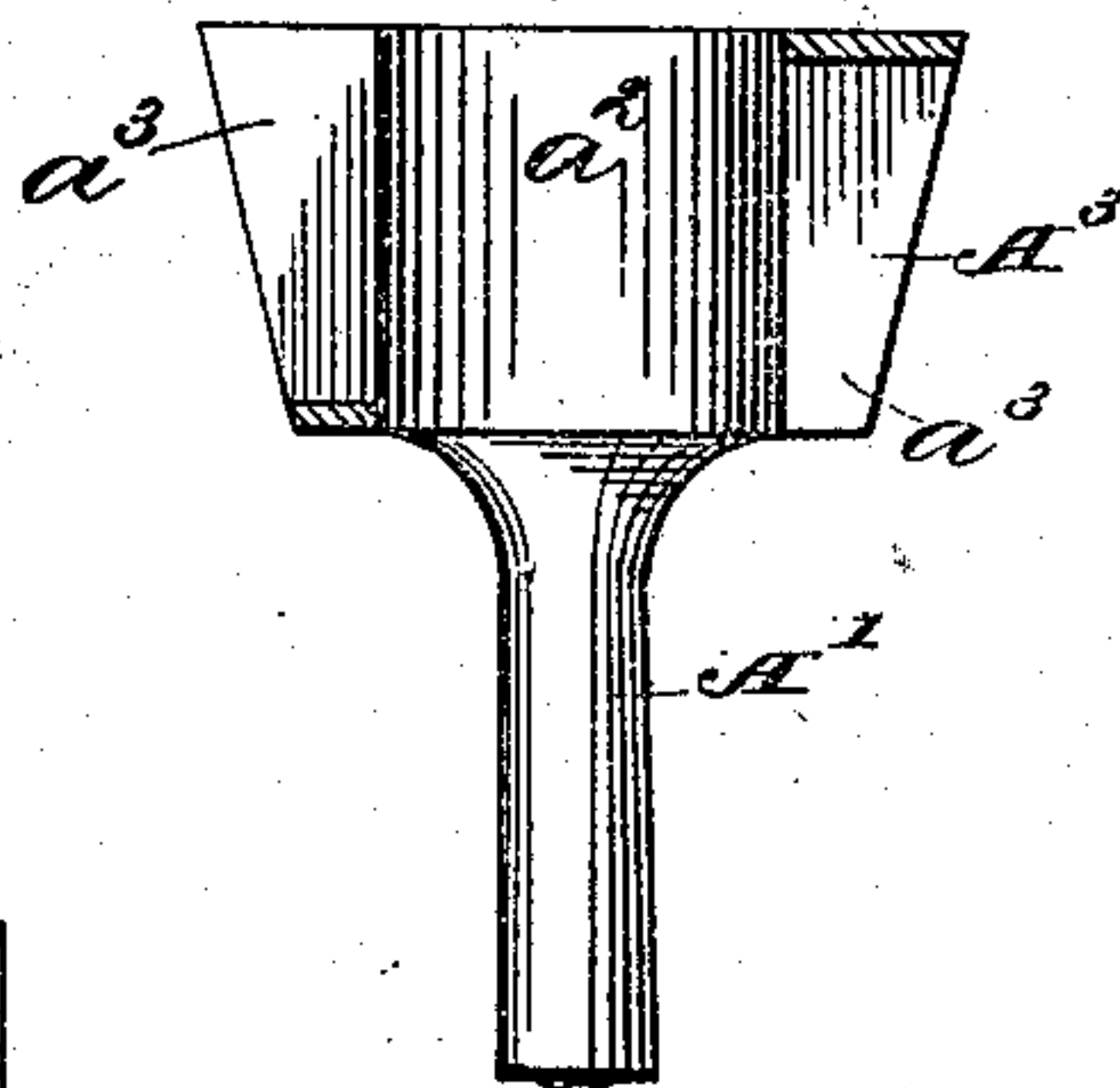
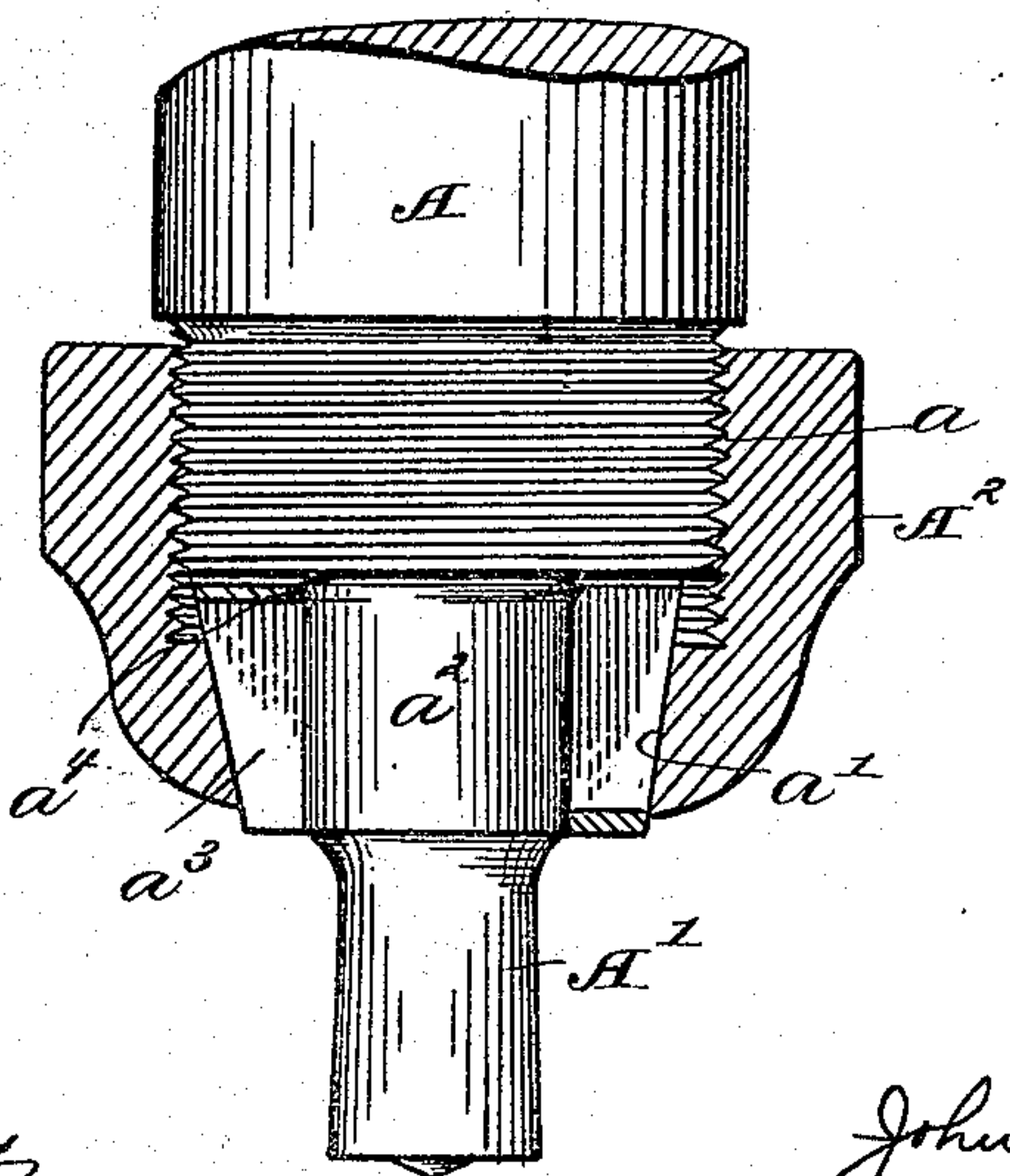


Fig 2



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN F. DOOLITTLE, OF CLEVELAND, OHIO, ASSIGNOR TO THE CLEVELAND STEEL TOOL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PUNCH.

No. 900,009.

Specification of Letters Patent.

Patented Sept. 29, 1908.

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To all whom it may concern:

Be it known that I, JOHN F. DOOLITTLE, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Punches, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

This invention relates, as indicated, to punches, by which term it is desired to designate not merely tools designed primarily for strictly punching operations, as for the punching of rivet holes and the like in sheet metal and structural material, but also any form of similar tool such as is used for setting rivets and forming or bending metallic articles. All such tools are intended to be likewise included in the designation.

The object of the invention is the provision of an improved form of coupling for securing the punch tool to the shank of the plunger, or holder, whereby the tool proper is designed to be forced to or through its work.

To the accomplishment of this and related objects, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing: Figure 1 represents a side elevation of a plunger shank and punch tool affixed thereto by a coupling embodying my several improvements; Fig. 2 is a central vertical section of the same; Fig. 3 is a perspective view of a clamping member forming an element of such structure, and Fig. 4 is a vertical sectional detail view showing a slightly modified construction in the form of the punch tool and clamping member.

The shank A of the plunger to which the punch tool A' is designed to be affixed is of the usual construction, its lower end a being threaded for some distance to permit the screwing thereto of the coupling nut A². The exterior form of such coupling nut is a matter of indifference; the lower portion of its bore a', however, is tapered as shown in

Fig. 2. Fitted to this tapered portion of the coupling is a clamping member A³, which constitutes one of the features of the device. Such member comprises an annular sleeve, Fig. 3, the exterior form of which, as indicated, is complementary to that of the coupling bore, while it, itself, is adapted to receive the body a² of the punch tool. Annular member A³ is slitted, the slit a³ alternating from opposite sides and extending substantially the length of the sleeve whereby it is rendered compressible more or less after the fashion of a chuck. It will accordingly be seen that when the punch tool is placed therein and the member thereupon attached to the lower end of the plunger shank by the coupling nut, the effect of drawing up the latter will be to cause it to firmly grip the body of the punch tool and securely retain the same against movement or dislodgement.

While with my improved clamping device I am enabled thus securely to attach the punch tool to the shank, I find that the security of the connection of the tool to the shank is increased by flanging the upper end of the tool body and beveling or reaming a corresponding portion a⁵ of the bore in the clamping sleeve to receive such flange or shoulder a⁴. The work may then be stripped from the projecting portion of the tool without any danger of the latter being loosened in its seat which might render the tool more liable to fracture. The shoulder a⁴ I preferably form by rolling down the end of the tool body since thereby a considerable saving of material is effected over the prevailing method of forming shoulders on tools of this sort by machining them down, while obviously a corresponding saving of time and labor is effected. A very slight shoulder serves every purpose in view of the effective clamping action of the annular sleeve when constructed as set forth.

Since it is the metal formerly constituting the edge of the punch body that is rolled down to provide shoulder a⁴, such edge it will be seen is rounded off and the upper end of the bearing surface of the body correspondingly reduced, such end being in effect given a slightly convex conformation. This serves still further to distinguish the construction in hand from the present type of shouldered punch tool; for by this means the shoulder escapes the compression strain incident to the downward, or operative,

movement of the device, being subject only to the relatively light duty of holding the tool against dislodgment when the work is stripped therefrom.

5 With the old form of tools, particularly after the lower end of the holder or shank A has become battered with use, it is not infrequent for the shoulder to be broken off bodily from the tool by the shearing stress
10 to which it is subjected.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

20 1. In a device of the character described, the combination of a shank, a coupling nut adapted to be secured to the end of said shank, the lower portion of the bore in such coupling being tapered, a tool, and an annular clamping member fitted to the lower portion of said coupling bore and adapted to receive said tool, said clamping member being alternately slitted from opposite ends.

2. In a device of the character described,
30 the combination of a shank, a coupling nut adapted to be threaded onto the end of said shank, the lower portion of the bore in such coupling nut being tapered, a tool, and an annular clamping member fitted to the lower portion of the bore in said coupling nut and adapted to receive said tool, said tool having its upper end formed with a shoulder and the upper end of the bore in said clamping member being beveled to receive such shoulder, such shoulder lying below the end of the tool and the latter having its bearing surface reduced, whereby the strain is brought within the body of the punch when the device is in operation, substantially as described.

45 3. In a device of the character described, the combination of a shank, a coupling nut adapted to be threaded onto the end of said shank, the lower portion of the bore in such coupling nut being tapered, a tool, and a clamping member comprising an annular sleeve fitted to the lower portion of the bore in said coupling nut and adapted to receive said tool, said tool having its upper end rolled down to form a slight shoulder, and said
55 clamping member being alternately slitted from opposite ends and having the upper

end of its bore reamed out to receive such shoulder.

4. In a device of the character described, the combination of a shank, a coupling nut
60 adapted to be threaded onto the end of said shank, the lower portion of the bore in such coupling nut being tapered, a tool, and an annular clamping member fitted to the lower portion of the bore in such coupling nut and
65 adapted to receive said tool, the upper edge of the body of said tool being rolled down to form a slight shoulder, and the upper end of the bore in said clamping member being reamed out to receive the shoulder thus
70 formed, the upper end of such punch body having its bearing surface reduced, whereby the strain is brought within the body of the punch when the device is in operation, substantially as described.

5. In a device of the character described, the combination of a shank, a coupling nut adapted to be threaded onto the end of said shank, the lower portion of the bore in such coupling nut being tapered, a tool, and a
80 clamping member comprising an annular sleeve fitted to the lower portion of the bore in said coupling nut and adapted to receive said tool, the upper edge of the body of said tool being rolled down to form a slight laterally projecting shoulder, said clamping member being alternately slitted from opposite ends and having the upper end of its bore reamed out to receive such shoulder, the upper end of such punch body being left rounded, whereby the strain is brought within the body of the punch when the device is in operation, substantially as described.

6. In a device of the character described, clamping means comprising the combination
95 with a threaded coupling nut having the lower portion of its bore tapered, of an annular sleeve fitted to such lower portion of such bore and alternately slitted from opposite ends.

7. As a new article of manufacture, a punch tool including a punch body having its upper edge rolled down to form a slight laterally projecting shoulder, the upper end of such body having its bearing surface
105 reduced.

Signed by me this 19th day of February, 1908.

JOHN F. DOOLITTLE.

Attested by—

MARY ISRAEL,
JNO. F. OBERLIN.