

(Model.)

R. B DONALDSON.
Socket Handle for Tools.

No. 233,486.

Patented Oct. 19, 1880.

Fig. 1.

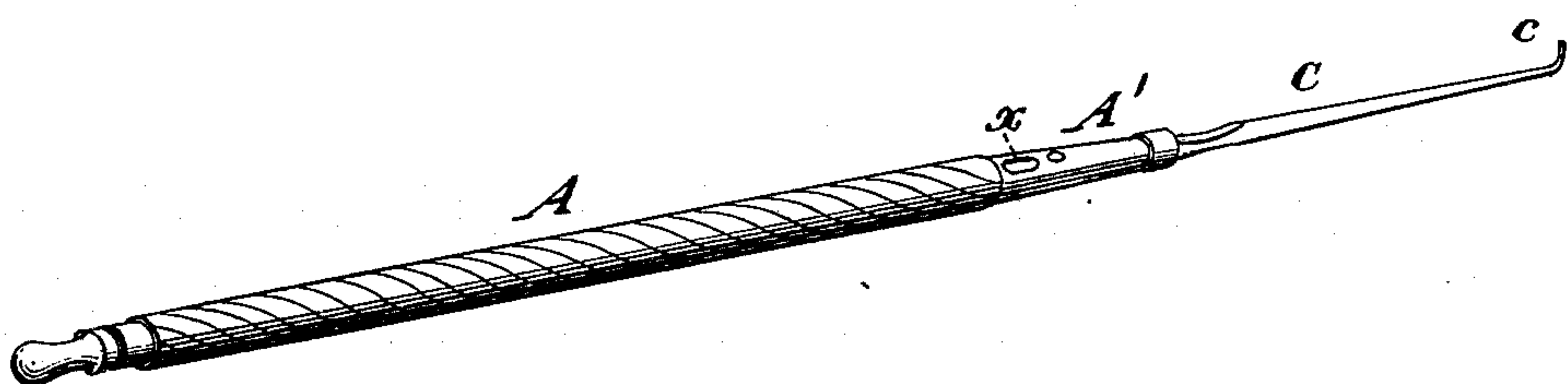


Fig. 2.

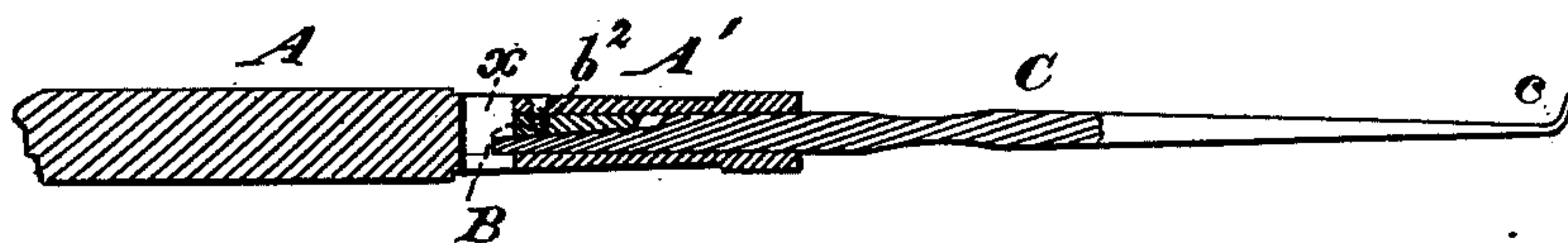


Fig. 3.

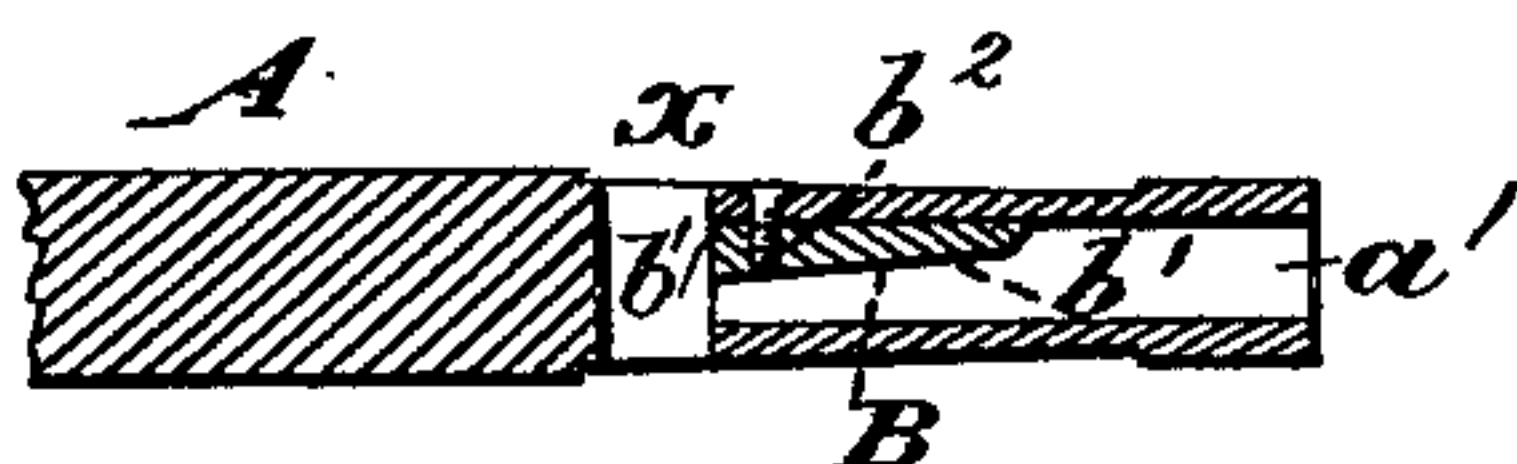
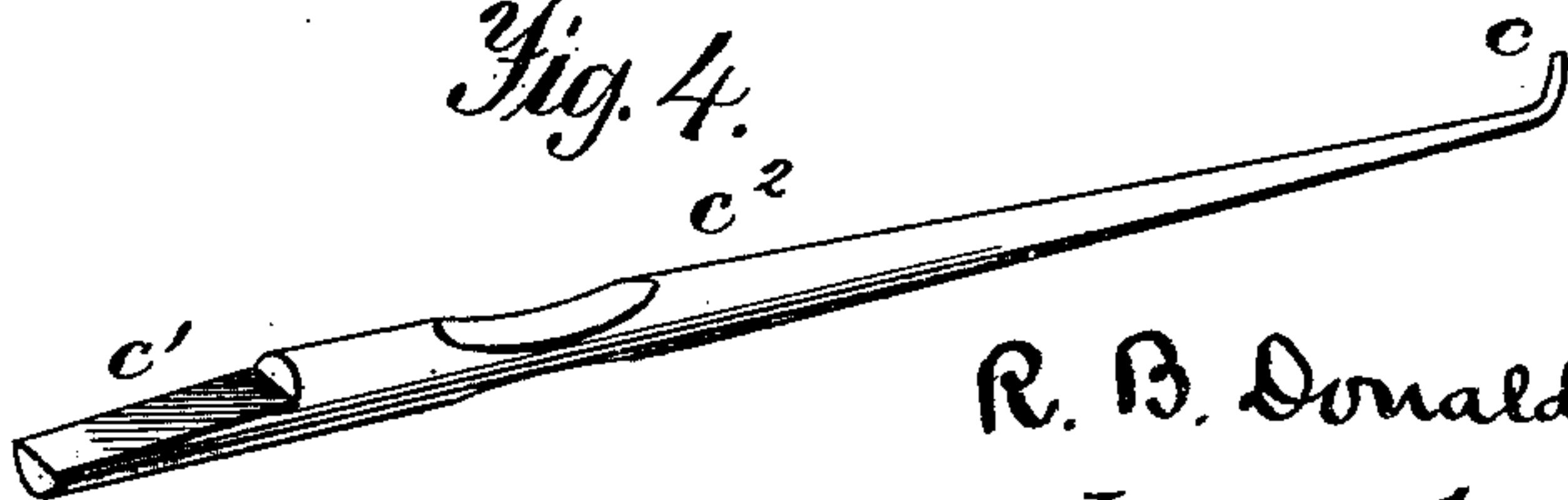


Fig. 4.



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UNITED STATES PATENT OFFICE

ROBERT B. DONALDSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

SOCKET-HANDLE FOR TOOLS.

SPECIFICATION forming part of Letters Patent No. 233,486, dated October 19, 1880.

Application filed September 13, 1880. (Model.)

To all whom it may concern:

Be it known that I, ROBERT B. DONALDSON, of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Socket-Handles for Tools; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to socket-handles or tool-holders for use of dentists, surgeons, engravers, designers, and the like, but particularly designed for dentists; and the novelty consists in the construction, arrangement, and adaptation of parts, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

In the dental profession socket-handles are in very general use for holding small instruments adapted to them, and many attempts have been made to provide for the retention of the tool or instrument within the socket when in use while permitting of its easy withdrawal therefrom when desired. To this end socket-handles have been designed and are now in use with a thread cut either at the outer end or at the bottom of the socket to fit a like thread cut upon the end of the instrument which enters it. While this form of socket-handle prevents any danger of the sudden withdrawal of the tool from it while in use, it is open to the objection of the great liability of the tool to turn in the socket when the pressure, which is frequently very great upon the end of the tool, is in a direction to unscrew it from the socket.

The object, then, being to obtain a firm hold of the tool within the holder or socket-handle, and to afford certain and quick means of disconnecting the tool, my invention consists in a handle of any desired shape and size, having at one end a cylindrical opening or socket of proper depth designed to receive the interchangeable tools.

The socket end of the handle is preferably made of steel, as it resists wear better than any other material that could be used for the purpose.

As a means of securing the shank of the tool firmly within the socket, and absolutely preventing its turning therein while in use, a wedge-piece is used, made preferably of steel, about half-round, and of a length corresponding to from one-fourth to one-half the depth of the socket-hole. The entire length of the rounding surface of this wedge-piece fits closely against the surface which bounds the socket hole or opening, while the flat surface of the same is filed so as to form a very slight incline or angle from the end nearest the orifice of the socket-hole. To secure this wedge-piece rigidly and immovably within the socket I drill a hole through the center of it and cut a thread to receive a small screw, which enters it through a hole of proper size drilled through one side of the cylinder or metal surrounding the socket-hole, and slightly countersunk at the outer surface. This screw, which consists merely of a few threads cut upon the end of a round piece of steel wire, is, when screwed into the wedge-piece, allowed to project slightly beyond the surface of the socket-cylinder, and is riveted securely in the countersink therein, so that when filed even with the surface and polished there is left no outward evidence of a rivet being there.

The end of the tool which enters the socket has a flattened surface, slightly inclined, to correspond with the inclined flattened surface of the wedge-piece, against which it abuts when in position, the flattened surface upon the tool being, however, longer than the wedge-piece, so as to admit of the tool being driven in farther should there be any wear upon the abutting surfaces, and also to allow the inner end of the instrument to project beyond the wedge-piece and slightly within a transverse eye through the cylinder. The transverse eye is elongated to a sufficient extent to allow the end of the tool to enter and to allow of its being relieved of its frictional contact with the wedge-piece by a lever placed behind it and acting within said eye. The incline upon these flattened surfaces is very slight, but sufficient to hold the parts in contact by friction, this friction being caused by the contact of the inclined longitudinal surfaces of the tool and the wedge-piece.

In the accompanying drawings, which form a part of this specification, Figure 1 is a per-

spective view of tool and handle; Fig. 2, a longitudinal section of the complete device with the tool in position. Fig. 3 represents a vertical longitudinal section through the vertical center, showing the wedge-piece with the tool withdrawn; Fig. 4, a perspective view of the tool.

Referring to the drawings, A represents the handle, which may be of any material, and roughened or ornamented to suit, and A' the socketed portion of the handle having an aperture, a' , and elongated transverse eye x , which passes entirely through the cylinder A'.

B represents the wedge-piece, which is fixed to the inner surface of the cylinder A by a screw through an aperture or by other proper securing means. The piece B has a threaded aperture, b^2 , and an inclined longitudinal plane, b' , which corresponds with a similar incline upon the inner end, c' , of the tool C, which has a shank, c^2 , and an operating end, c , as shown.

It being well known that friction caused by metallic articles of wedge shape and of similar consistence and approximately-similar atomic fineness gives a powerful frictional force in consequence of the atomic affinity or the closer relation which the atoms will assume, it will be readily understood that these confined wedge-shaped surfaces will hold the tool within the cylinder with sufficient force for all practical purposes.

To place and hold the wedge-piece B in position I use one of the tools adapted to my socket-handle or a piece of steel wire of the same diameter properly flattened and inclined toward the end, by means of which I push the wedge-piece into the socket until the threaded aperture registers with the aperture in the socketed portion of the handle. While the parts are thus held firmly in position the screw is inserted through the aperture in the socket and into the threaded hole in the wedge-piece until the end of the screw meets the flat surface of the holding-tool, which, of course, will prevent its protrusion above the flattened surface of the wedge-piece. The outside end of the screw is then riveted down upon the surface of the cylinder and afterward filed off and polished, as before stated. The placing-tool is then withdrawn, leaving the wedge-piece firmly secured in proper position.

In my device, in order to apply the tool to the handle, it is only necessary to present the tool within the cylinder, so that the planes b' c' of the parts B C will correspond, and, holding the tool with a pair of pliers, or even in the fingers, strike the butt of the handle sharply

upon a resisting surface, when the sudden stoppage of the momentum of the tool thus established will wedge the tool within the cylinder in such a manner that, for the reason hereinbefore set forth—the friction—it would require a great force to pull the tool out of contact, while it is susceptible of being released by a slight action of a proper lever within the eye x , because of the increase of power due to the extended purchase.

As before observed, in cases where the tool is screwed into the handle and the operating end is at an angle, there is danger of the tool turning while in use. My invention entirely obviates this difficulty through having the flat bearing-faces, one of which is rigid, and a prying effect, by rotating the handle, may be thus effected without the danger of turning the instrument in the socket. This is a feature of great importance, especially in instruments used in operating upon the teeth.

Tool-sockets have been made where an incline on the shank was made to bear against an incline in the socket opposite an opening in said socket. In such construction there was a tendency to bend the shank away from the incline. By putting my wedge-piece entirely within the hollow cylinder I overcome this objection.

What I claim is—

1. The tool herein described, consisting of a hollow cylinder having a transverse perforation, as x , and within the cylinder, below the perforation, a rigid plate or wedge-piece, as B, with inclined flattened surface adapted to receive and hold an operating-tool, C, having a corresponding incline, substantially as set forth.

2. The combination of the cylinder A', having longitudinal aperture a' and transverse slot x , and the beveled piece B, secured in cylinder, as described, with the tool C, having operating end c , extension c^2 , and bevel c' , as and for the purposes set forth.

3. The combination, with the hollow cylindrical socket A', of the piece B, rounded on one side and having a flat inclined surface on the other, and the screw engaging the wedge-piece and riveted down outside the socket, as described.

In testimony that I claim the foregoing I have hereunto set my hand this 13th day of September, 1880.

ROBERT B. DONALDSON.

Witnesses:

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