(No Model.)

A. H. ARMSTRONG.

BIT HOLDER.

No. 307,252. Patented Oct. 28, 1884.

Fig. 1.

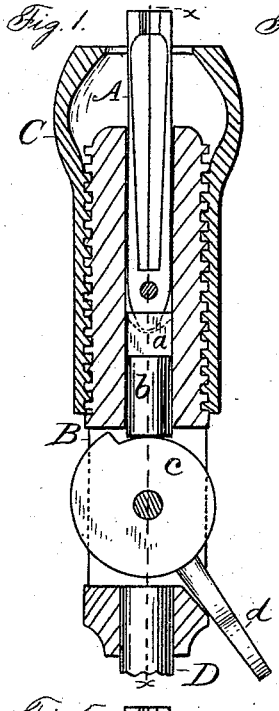


Fig. 2.

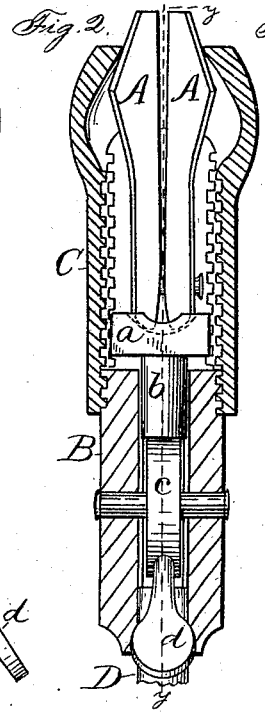


Fig. 3.

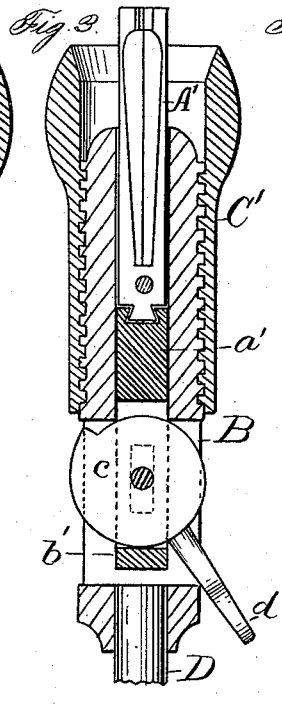


Fig. 4.

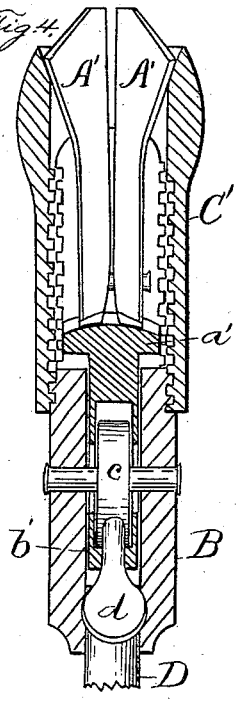


Fig. 5.

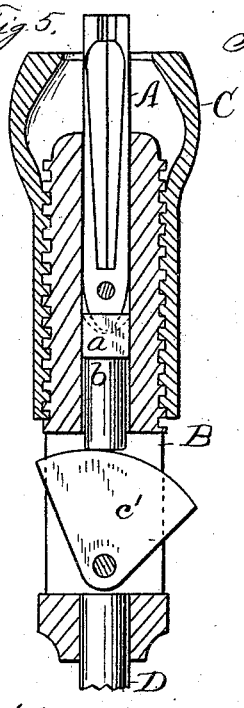


Fig. 6.

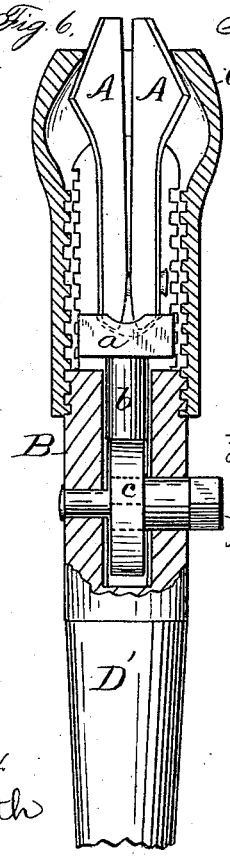


Fig. 7.

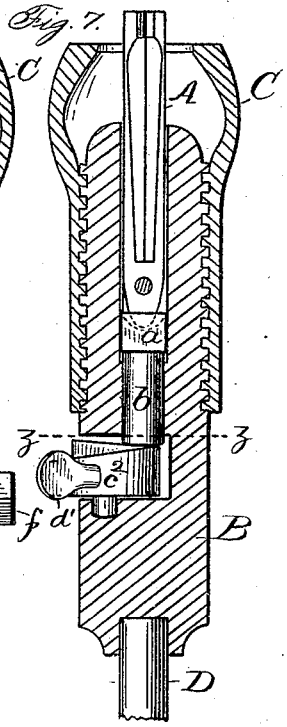
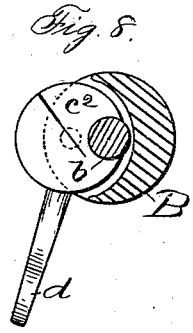


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARTHUR H. ARMSTRONG, OF PLAINVILLE, CONNECTICUT.

BIT-HOLDER.

SPECIFICATION forming part of Letters Patent No. 307,252, dated October 28, 1884.

Application filed July 2, 1884. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. ARMSTRONG, a citizen of the United States, residing at Plainville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Bit-Holders, of which the following is a specification.

My invention relates to improvements in holders for bits and other tools of the class having holding-jaws which are forced together under the influence of a screw sleeve or thimble; and the object of my improvements is to provide a mechanism for binding the jaws upon the tool-shank still tighter after they have been grasped as firmly as is possible by means of the screw sleeve or thimble. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of my bit-holder, partly in elevation, on line *y y* of Fig. 2. Fig. 2 is a like view of the same on line *x x* of Fig. 1. Figs. 3 and 4 are corresponding views of the same in a modified form. Fig. 5 is a view corresponding with Fig. 1 of another modification of my holder. Fig. 6 is a view corresponding with Fig. 2 of another modification thereof. Fig. 7 is a view corresponding with Fig. 1 of another modification thereof, and Fig. 8 is a transverse section thereof on line *z z* of Fig. 7.

A A designate holding-jaws of the class which are forced endwise down into the head B of the tool-holder under the influence of the screw sleeve or thimble C, which is fitted to the head B by means of screw-threads, as shown. These jaws are made tapering at their outer ends, so as to be forced together by the mouth of the screw-thimble in a well-known way, while their inner ends are forced together by resting in a concavity in the foot or block *a*. I form this concavity in a sliding block with its shank *b* extending downward into a transverse slot through the head B. Within this transverse slot I arrange the cam *c* in such relation to the sliding block *a* that the shank *b* of said block rests upon the inclined surface of the cam *c*. In most cases I furnish said cam with an operating handle or lever, *d*.

In Fig. 5 I have substituted the cam *c'* for the cam *c*, and instead of the handle or lever *d*, I operate said cam by pressing directly upon the edges, which are exposed by the slot through the head.

In Fig. 6 I employ the cam *c;* but instead of the handle or lever *d*, I mount the cam so as to necessarily move with the shaft on which it turns, and I square the end of the shaft, as at *f*, for the application of a wrench by which to operate the cam.

In Figs. 7 and 8 I substitute the cam c^2, having the inclined surface upon its side instead of at its edge, and pivot the same, as shown, and provide said cam with an operating-handle, *d'*.

In Figs. 3 and 4 I have represented holding-jaws A' of the class which are forced together under the action of a screw sleeve or thimble, C', as it is forced outward. The inner ends of these jaws I arrange in a dovetailed groove in the upper part of the sliding block *a'*, so that the jaws may be retained within said sliding block when they are pushed outward by the screw-thimble. I form the upper end of the block *a'* and the dovetailed slot through it of a rounded or beveled form, as shown in Fig. 4, so that a pulling strain upon the jaws will have a tendency to throw the inner ends of the jaws together. I employ substantially the same cam, *c*, in connection with this sliding block; but instead of having the shank *b'* of the sliding block *a'* rest upon the top of the cam, I slot said shank so that it surrounds the cam, and the under side of said cam bears upon the solid wall at the lower end of the slot in the shank *b'*, as shown, so that a forward movement of the cam—that is, in such a direction as to continually present a higher point to the end of the slot in the shank *b'*—will force said shank, sliding block, and jaws A' downward into the screw sleeve or thimble, whereas in the construction shown in the other figures a forward movement of the cam forces the sliding block and jaws upward and outward against the mouth of the screw-thimble. In either event, when the cams are at rest, the sliding blocks are firmly supported thereby, and the jaws may be operated under the influence of the screw-thimble the same as if there were no cam present, and as if the sliding block were stationary. After the screw-thimble has been turned down or up, as the case may be, to bind the jaws upon the shank of the tool as firmly

as it is possible to do by said means, the cams may be operated so as to move the sliding blocks and still more firmly press the jaws upon the object which they are gripping, whereby said object is held very securely and may be grasped with such pressure under the influence of the cam that it is impossible to unscrew the thimble or sleeve without first loosening the cam.

My tool-holder is principally designed for use upon bit-stocks, and in all of the figures except Fig. 6 it is shown as adapted to be applied thereto and with the end D of a brace-bow connected therewith.

In Fig. 6 I have provided my tool-holder with a tapering shank, D′, in order to adapt it for use in a lathe as a holding-chuck. For such use it may be advisable sometimes to employ three or more jaws instead of two, which change can be readily made by any mechanic.

The jaws herein shown are recessed upon their faces with special reference to holding tools which have a pyramidal shank; but those faces may be furnished with rounded parallel grooves or otherwise suitably recessed, in which case it would be unnecessary to make provision for moving the ends of the jaws independently to throw them out of parallelism.

It will readily be seen that the sliding block *a* is in the nature of an intermediate piece, which, so far as its movement is concerned, performs no function other than to communicate the pressure of the cam to the jaws, that pressure being precisely the same as if the cam acted directly upon the ends of the jaws. From this fact such intermediate pieces are often termed "idlers." If desired, a V-shaped groove may be formed in the working-face of the cam, to act as the equivalent of the concavity in the sliding block, in which case the intermediate piece or idler may be dispensed with and the inner ends of the jaws may be made to rest directly upon the working-face of the cam. In many tool-holders the concavity and all means for acting directly upon the inner ends of the jaws to force them toward each other are omitted, in which case there is no use for the sliding block, as such jaws may rest directly upon the cam.

I am aware that companion jaws with tapering ends, acted upon by a screw-thimble and a concavity in the foot of a slotted socket or head to force them together, are old and well known, and I hereby disclaim the same.

Similar tool-holders have also been provided with sliding blocks at the inner end of the jaws, in some cases with a concavity in the block, within which the beveled ends of the jaws rested, and in other cases with the jaws hinged to said sliding block. Tool-holders having such sliding blocks are also disclaimed.

I do not wish to limit my invention to any particular style of holding-jaws and screw-thimble, but wish to include any ordinary form thereof, inasmuch as my invention relates to providing such jaws with an additional mechanism for still more firmly grasping the tool after the holder in its prior condition had grasped the tool to the utmost extent.

As illustrated, the additional mechanism for gripping the jaws to a further extent consists, essentially, of a cam, which, considered as a cam only, is not new; but inasmuch as I believe myself to be the first inventor of a tool-holder in which are combined the ordinary gripping devices and an additional gripping mechanism, I do not wish to limit my invention specifically to a cam, as any other ordinary mechanical substitute for imparting pressure combined with an ordinary bit-holder I consider an equivalent therefor.

I claim as my invention—

1. A tool-holder having holding-jaws, a sleeve or thimble, and connecting screw-threads for gripping said jaws to a certain extent, in combination with a cam or equivalent additional mechanism for operating in connection therewith for gripping said jaws to a further extent, substantially as described, and for the purpose specified.

2. The combination of the head B, the holding-jaws, the screw-thimble for gripping said jaws to a certain extent, the sliding block, and the cam for operating said block and gripping said jaws to a further extent, substantially as described.

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