No. 701,948. Patented June 10, 1902.

P. L. SENN.

APPARATUS FOR EXTRACTING SCREW BOLTS, &c.

(Application filed Apr. 9, 1902.)

(No Model.)

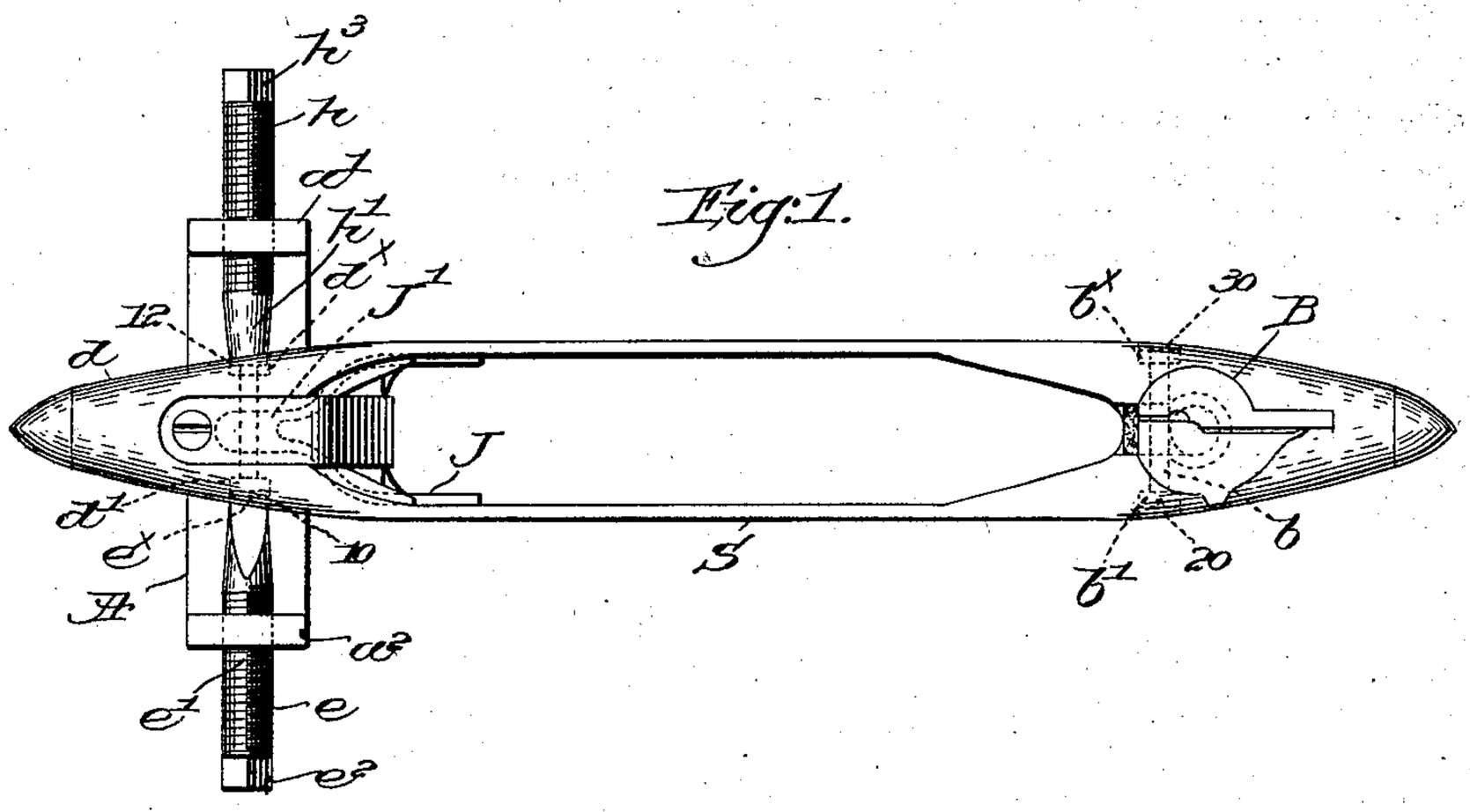

Fig: 1.

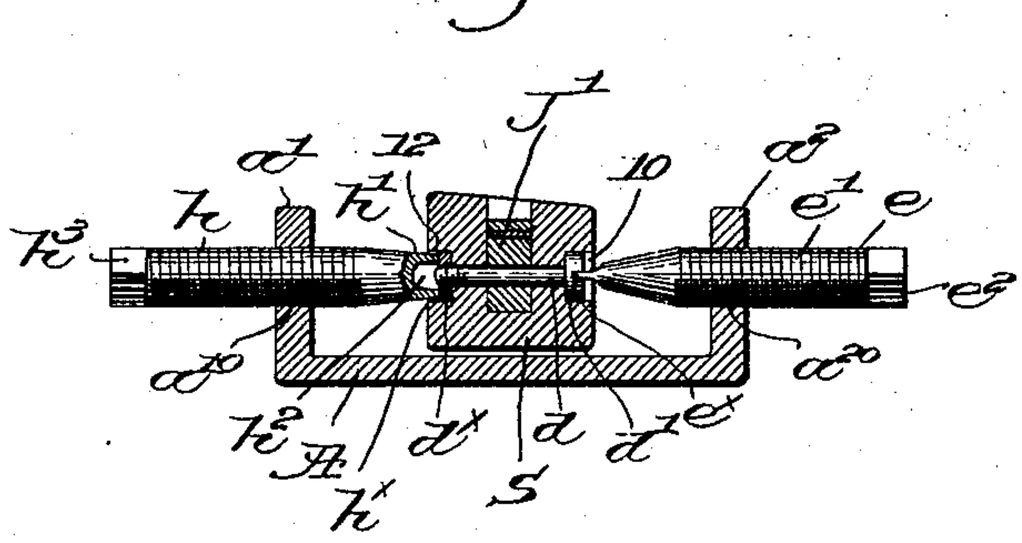

Fig: 2.

Fig: 3.

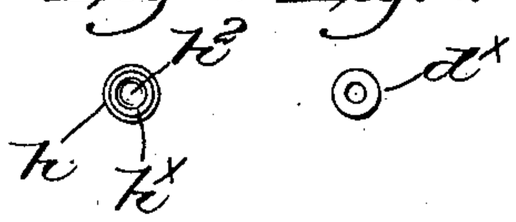

Fig: 4.

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UNITED STATES PATENT OFFICE.

PRESTON L. SENN, OF VAUCLUSE, SOUTH CAROLINA, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

APPARATUS FOR EXTRACTING SCREW-BOLTS, &c.

SPECIFICATION forming part of Letters Patent No. 701,948, dated June 10, 1902.

Application filed April 9, 1902. Serial No. 102,003. (No model.)

To all whom it may concern:

Be it known that I, PRESTON L. SENN, a citizen of the United States, and a resident of Vaucluse, county of Aiken, State of South Carolina, have invented an Improvement in Apparatus for Extracting Screw-Bolts, &c., of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of means for extracting screws, screw-bolts, and the like from their seats or sockets when from the nature of their position or for other reasons it is difficult to obtain a hold on the nut to prevent it from turning with the screw-bolt.

Loom-shuttles provided with self-threading devices are frequently provided with a transverse retaining screw or bolt which passes through a hole in the shuttle-body and the threading-block and is held in place by a circular nut, the hole or socket in the shuttle-body being countered at its ends to receive the screw-head and nut, respectively. Such a retaining-screw is shown in United States Patent No. 632,209, and in Patent No. 630,793 the round nut is shown on the end of the screw-bolt, which retains in place the jaws for engaging the head of the filling-carrier. Sometimes the nut or screw will become slightly rusted or the threads may be somewhat jammed, so that when the screw is rotated to withdraw it the nut will rotate with the screw and prevent their separation, and heretofore it has been a very difficult matter to withdraw the screw owing to the location of the nut, sunk in a counterbore in the side of the shuttle, making it almost impossible to hold the nut. By my present invention I am enabled to withdraw or extract such screws or screw-bolts with ease and despatch notwithstanding the inaccessibility of the nut.

Figure 1 is a top or plan view of an extracting apparatus embodying one form of my invention shown in readiness to extract the screw-bolt from a loom-shuttle. Fig. 2 is a transverse sectional view thereof on the line $x\ x$, Fig. 1. Fig. 3 is an inner end view of the nut-holder, and Fig. 4 is a plan view of a circular nut such as is commonly used in loom-shuttles.

Referring to Fig. 1, the shuttle-body S is provided with holding-jaws J and a threading-block B, of a type similar to that shown in Patent No. 630,793 referred to, the jaws being held in place by a screw-bolt d, Figs. 1 and 2, passed through the shuttle-body transversely, the hole being counterbored at its opposite ends, as at 10 and 12, Fig. 2, the nicked head d' of the screw-bolt entering the former, while a circular nut $d^{\times}$, Figs. 2 and 4, is seated in the latter and engages the threaded shank of the bolt, which latter passes through the base J' of the jaws J. A similar screw-bolt b and nut $b^{\times}$, Fig. 1, retain the threading-block B in position, the bolt-head b' and nut being seated in counterbores 20 30, respectively.

The extracting device, as herein shown, comprises a flat strong base-plate A of suitable length and provided with rigid upturned ears a' a^2, opposite each other and in parallelism, threaded holes or bearings a^{10} a^{20} in said ears being located in axial alinement. (See Figs. 1 and 2.) In the bearing a^{10} an adjustable nut-holder is mounted, it comprising a threaded shank h, having its inner end reduced in diameter, as at h', to enter one of the counterbores, as 12 or 30, of a shuttle-body, this reduced end being recessed or cupped, as at h^2, Figs. 2 and 3, to present an annular holding-surface $h^{\times}$, Fig. 3. The outer end of the nut-holder is made square or polygonal, as at h^3, to receive a wrench or other suitable device whereby the nut-holder may be rotated. The extractor is mounted in the bearing a^{20}, and consists of a shank e, having a thread e' thereon to engage the threaded bearing, the pitch of the thread e' being the same as that of the screw-bolt to be extracted. At its inner end the extractor is brought down to a flattened or chisel end $e^{\times}$ to enter the nick in the screw-head, while the outer end of the shank is made polygonal, as at e^2, to receive a wrench.

Suppose that the screw-bolt d is to be extracted from the shuttle. Then the latter is placed substantially midway between the ears a' a^2 and the nut-holder is turned in its

bearing to bring its annular bearing-face $h^{\times}$ against the outer face of the nut $d^{\times}$, the extractor having been previously set up and its chisel end $e^{\times}$ inserted in the nick of the screw-head. The nut-holder is then set up against the nut $d^{\times}$ until the latter and the screw-bolt are firmly and securely clamped between nut-holder and extractor, the cup h^{2} of the former receiving the end of the bolt if it projects beyond the nut. Now by rotating the extractor in the direction to move it outward through the ear a^{2} the screw-bolt will be rotated with it; but as the pitch of the bolt-thread and the extractor-thread e' is the same the original pressure exerted by the nut-holder on the nut will be maintained, the nut being clamped against the bottom of the counterbore 12 and held from rotation. The nut being held immovable and the screw-bolt being rotated by the rotation of the extractor, it follows that the bolt will be unscrewed and withdrawn from the nut, and while the latter is in engagement with the thread of the bolt the clamping hold upon the nut will be maintained. Usually the starting of the screw-bolt is the hardest to accomplish, for after it is once started its complete extraction is easy.

The adjustability of the nut holder and extractor when setting up enables screw-bolts of different lengths to be handled with equal readiness.

If desired, the apparatus can be employed in a reverse manner to set up a bolt tightly in place in its nut, as after the bolt has been partly screwed in the nut can be clamped, as described, and the operation completed. Ordinarily, however, the setting up of a screw-bolt is not a difficult matter and can be accomplished in different ways well known to those skilled in the art, so that the main purpose of my invention, as hereinbefore set forth, is the extraction of screw-bolts and the like.

While primarily intended for use in connection with loom-shuttles, and particularly well adapted therefor, my invention is not restricted to such use, and it is not restricted to the precise construction and arrangement herein shown and described, as various changes or modifications may be made without departing from the spirit and scope of the invention.

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

1. In a device of the class described, a frame, an adjustable nut-holder mounted thereon, a rotatable extractor in axial alinement with the nut-holder and having a threaded shank of the pitch of the screw to be withdrawn, and a threaded bearing on the frame for the shank, the object containing the screw to be withdrawn being inserted between said nut-holder and extractor and the former set up to press firmly on the nut while the latter is in engagement with the screw-head, rotation of the extractor as it moves longitudinally in its bearing turning out the screw therewith, the pressure of the nut-holder on the nut being maintained by or through the like pitch of the screw-thread and the thread on the extractor.

2. In a device of the class described, a frame having opposite rigid upturned ears, a threaded bearing in each, an axial alinement, a threaded, longitudinally-adjustable nut-holder mounted in one bearing and having a cupped end, to engage the outer face of the nut, and an extractor constructed at its inner end to engage the screw-head and having its shank threaded to correspond with the pitch of the screw to be removed, said extractor being mounted in the opposite threaded bearing of the frame, rotation of the extractor withdrawing the screw while the pressure of the nut-holder is maintained upon the nut to prevent rotation of the same.

3. In a device of the class described, a frame comprising a base and opposite, upturned ears thereon having threaded bearings in axial alinement with each other, the ears being adapted to receive between them the end of a loom-shuttle containing the screw to be removed, a nut-holder having a threaded shank, rotatably mounted in one bearing and having its inner end cupped to bear against the nut of the screw in the shuttle and to clear the adjacent end of the screw, and a rotatable extractor having a threaded shank of a pitch corresponding to that of the screw to be removed and rotatably mounted in the other bearing, the inner end of the extractor being adapted to enter the nick of the screw-head, the nut-holder being adjusted to tightly press upon and hold the nut from rotation when the extractor is in engagement with the screw-head, subsequent rotation of the extractor acting to unscrew the screw from the nut, the like pitch of the screw-thread and thread of the shank of the extractor maintaining the pressure of the nut-holder upon the nut to prevent it from turning with the screw.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PRESTON L. SENN.

Witnesses:
JOHN AMPREY,
THOS. E. SIAGO.

Correction in Letters Patent No. 701,948.

It is hereby certified that in Letters Patent No. 701,948, granted June 10, 1902, upon the application of Preston L. Senn, of Vaucluse, South Carolina, for an improvement in "Apparatus for Extracting Screw-Bolts, &c.," an error appears in the printed specification requiring correction, as follows: In line 76, page 2, the word "an" should read *in;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of June, A. D., 1902.

[SEAL.]

F. I. ALLEN,

Commissioner of Patents.