J. A. LELAND.

CHUCK.

APPLICATION FILED JUNE 23, 1908.

912,582. Patented Feb. 16, 1909.

Fig. 1.

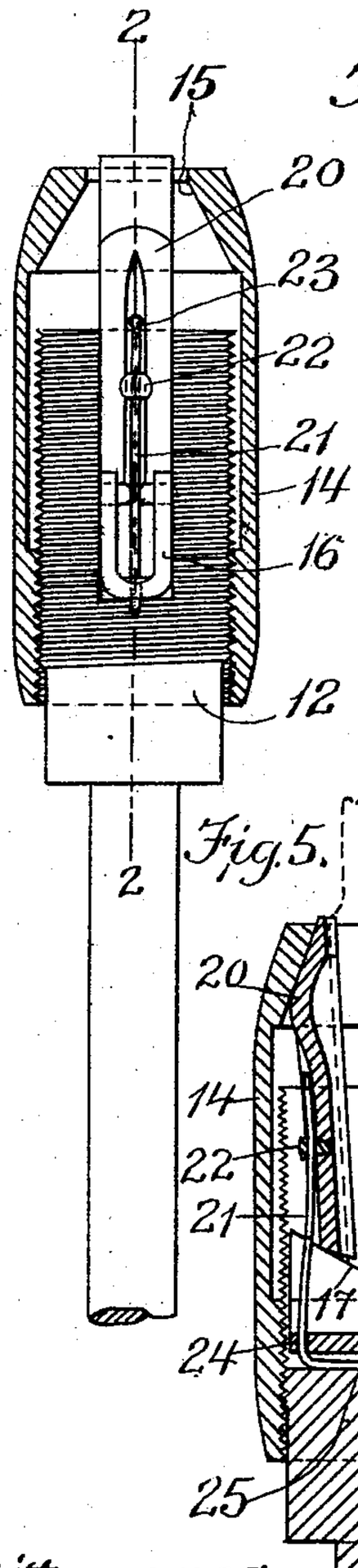

Fig. 2.

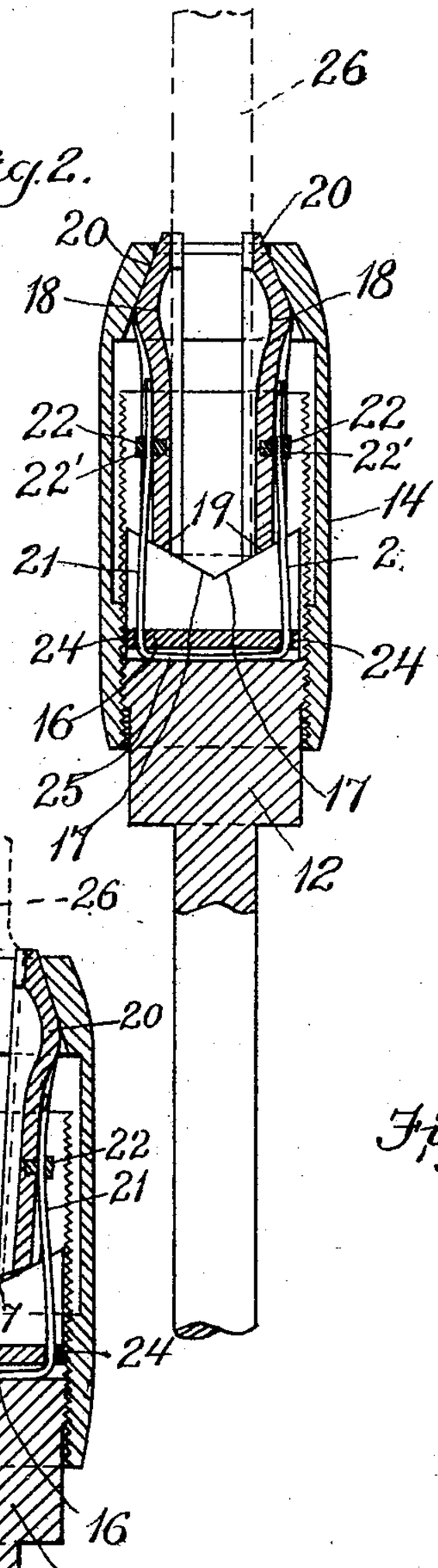

Fig. 3.

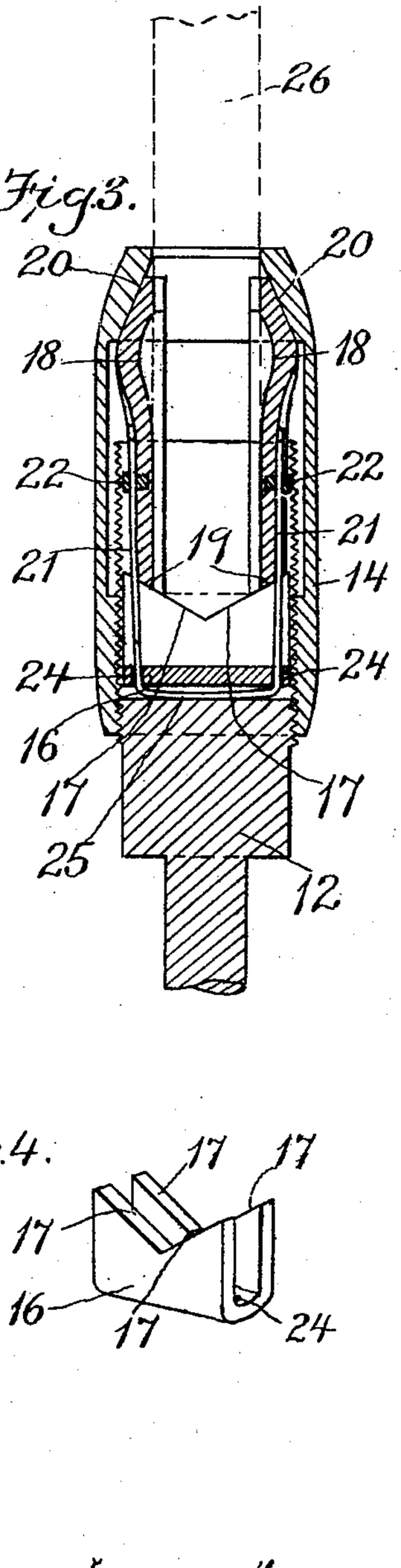

Fig. 5.

Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

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CHUCK.

No. 912,582. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed June 23, 1908. Serial No. 439,943.

To all whom it may concern:

Be it known that I, JOHN A. LELAND, of Millers Falls, town of Montague, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Chucks, of which the following is a specification.

This invention relates to chucks for bit stocks, and other like instruments, and particularly to that class of chucks employing a pair of tool shank grasping jaws, the acting faces of which are adapted to be held either parallel with each other, or inclined relatively to each other, under various adjustments, so that the jaws may be engaged not only with straight tool shanks of various sizes, but also with tapered shanks of various sizes.

The invention has for its object to provide a simple and efficient chuck of the character stated.

The invention is embodied in a chuck comprising a head having a transverse longitudinal opening, and inclined jaw seats in said opening, spring arms engaged at their inner ends with the head, jaws located in said opening and adapted to slide laterally on the inclined seats and longitudinally on the spring arms, and a jaw-adjusting sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws, the jaws being adapted by their sliding engagement with the jaw seats and with the spring arms, to stand either parallel with each other or inclined relatively to each other at different distances apart, so that they are adapted to engage either straight shanks or tapered shanks of various sizes.

Of the accompanying drawings forming a part of this specification, Figure 1 represents a side elevation of a chuck embodying my invention, the internally threaded sleeve being shown in section. Fig. 2 represents a section on line 2—2 of Fig. 1, showing the jaws adjusted to a relatively small tool shank. Fig. 3 represents a view similar to Fig. 2 showing the jaws adjusted to a larger tool shank. Fig. 4 represents a perspective view of the jaw chair shown in Figs. 1, 2 and 3. Fig. 5 represents a view similar to Figs. 2 and 3, showing the jaws adjusted to a tapered shank.

The same reference characters indicate the same parts in all the drawings.

In the drawings, 12 represents a chuck head which is externally screw-threaded, and has at its outer end portion a transverse longitudinally extending opening 13 which receives the jaw chair and jaws hereinafter described, the opening interrupting the continuity of portions of the screw-thread, as usual in chucks of this character.

14 represents a sleeve, a portion of which is internally screw-threaded to engage the thread of the head 12, the outer end portion of the sleeve being contracted to form the usual tapered abutment 15 adapted to bear on tapered faces on the outer ends of the chuck jaws in the usual way.

16 represents a jaw chair which is loosely inserted in the opening 13 and bears upon the bottom of said opening, the chair being preferably formed by bending a suitable metal plate or blank to form a pair of wings or flanges, and a neck or base connecting said flanges, as clearly shown in Figs. 1 and 4. The chair is provided with oppositely inclined seats 17, which, in this embodiment of my invention, are formed by cutting V-shaped notches in the outer ends of the flanges of the chair, so that in this case each of the inclined faces is composed of two parts, one on one of the flanges, and the other on the opposite flange.

18, 18 represent the chuck jaws which are provided with inclined inner ends 19 conforming to the inclined seats 17, and adapted to slide laterally thereon, the outer ends of the jaws being provided with inclined faces 20 bearing on the tapering abutment 15 of the sleeve.

21, 21 represent resilient arms which are engaged both with the head and with the jaws, the jaws having a sliding engagement with the arms by means of studs 22 projecting from the backs of the jaws between their ends, and having orifices 22′ through which the arms 21 pass, the studs being adapted to slide on the arms. The outer ends of the arms are preferably enlarged, as shown at 23, so that the studs 22 cannot be removed from the outer ends of the arms, provision being thus made for preventing the separation of the jaws from the arms. The arms 21 pass through orifices 24 formed for their reception in the base of the chair 16, and are retained in engagement with the chair by means of a neck 25 connecting the arms below the chair base.

In practice, the arms 21 and neck 25 are made in a single piece of suitably tempered steel wire, the arms having a tendency to spring outwardly in opposite directions so that they normally hold the jaws at the outer portions of the inclined seats 17, as shown in Fig. 3. The resilence of the arms 21, and the sliding engagement of the jaws therewith, permit the jaws to be moved inwardly and downwardly upon the seats 17, as indicated in Fig. 2, and to be inclined as indicated in Fig. 5.

It will be seen from the foregoing that the inner acting faces of the jaws, which are preferably grooved to form shank engaging angles, as usual, are adapted to be adjusted to tool shanks 26 of different sizes, whether the shanks are of uniform diameter at the portions engaged with the jaws, as indicated in Figs. 2 and 3, or of tapering form, as indicated in Fig. 5. When a shank 26 is inserted between the jaws, the latter being opened for the reception of the shank, the jaw-adjusting sleeve 14 is turned inwardly until the acting faces of the jaws come to a bearing on the shank, the pressure of the abutment 15 of the sleeve on the inclined faces 20 of the jaws forcing the jaws laterally inward toward each other, and at the same time moving them inwardly endwise to the extent permitted by the inclined seats 17. These combined movements cause a uniform bearing of the jaws along their entire length on the tool shank. When a relatively large shank is to be grasped, as shown in Fig. 3, the sleeve 14 is adjusted outwardly to permit the necessary separation of the jaws, the inner ends of the jaws occupying a higher position on the inclined seats when the shank is grasped. The sliding engagement of the jaws with the spring arms 21, and the sliding bearing of the inner ends of the jaws on the inclined jaw seats permit the described changes of position. The jaws are balanced on the spring arms by means of the studs 22, so that they are adapted to stand at any desired distance apart, and to assume any desired angles relatively to each other.

It will be observed that the studs 22 project outwardly from the backs of the jaws and are located between their ends, and between the inner ends of the jaws and the internally tapered portion 20 of the sleeve 14. This arrangement of the studs reduces to the minimum the flexure of the spring arms due to changes of position of the jaws, such as are required in adapting them to shanks of different sizes, or in their conformation to tapering shanks, and provides a connection between the spring arms and the jaws which does not interfere with the tapered portion of the sleeve. The studs arranged as described balance the jaws upon the spring arms in such manner that the jaws can be adjusted at various angles without extreme flexure of the spring arms. The jaws are therefore adapted to grasp straight or tapered shanks of any size within the capacity of the chuck.

The jaws and jaw chair connected as described by the spring arms may be inserted and removed as a single part, the spring arms and their connecting neck forming a permanent connection between the jaws and chair.

It is obvious that the jaws may be employed, if desired, to hold a tapering shank, the jaws being adapted to be oppositely inclined on the seats 17.

It will be seen that by forming the jaw seats 17 on a chair which is removably mounted in the opening in the head, and by engaging the spring arms 21 with said chair as shown, the said seats and arms, together with the jaws mounted on the arms, are adapted to be readily applied to and removed from the head, the chair constituting a device for engaging the seats and arms with the head. It is obvious, however, that the said jaw seats and spring arms may be permanently instead of removably connected with the head without affecting the described coöperation between the jaw seats, the spring arms, and the jaws, in grasping shanks of different sizes and shapes.

I claim:

1. A chuck comprising a head having a transverse longitudinal opening, and inclined jaw seats in said opening, spring arms engaged at their inner ends with the head, jaws located in said opening, and adapted to coöperate with the inclined seats and the spring arms in grasping either straight or tapered shanks, and a jaw-adjusting sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws, said jaws having means between their inner ends and the tapered portion of the sleeve for slidably engaging the spring arms and for reducing to the minimum the flexure of said arms caused by changes of position of the jaws.

2. A chuck comprising a head having a transverse longitudinal opening, and inclined jaw seats in said opening, spring arms engaged at their inner ends with the head, jaws located in said opening, and adapted to slide laterally on the inclined seats, and a jaw-adjusting sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws, said jaws having outwardly projecting studs on their backs slidingly mounted on the spring arms, and located between the inner ends of the jaws and the tapered portion of the sleeve, whereby the flexure of the spring arms caused by changes of position of the jaws is reduced to the minimum.

3. A chuck comprising an externally

screw threaded head having a transverse longitudinal opening, a jaw chair loosely mounted in said opening, and bearing on the bottom thereof, said chair having oppositely inclined jaw seats, jaws having inclined inner ends slidable on said seats, spring arms engaged both with the chair and the jaws, and yieldingly connecting the jaws with the chair, and an internally threaded sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws.

4. A chuck comprising an externally screw threaded head having a transverse longitudinal opening, a jaw chair loosely mounted in said opening and bearing on the bottom thereof, said chair having oppositely inclined jaw seats, jaws having inclined inner ends slidable on said seats, a yielding connection between the chair and jaws, composed of resilient arms slidingly engaged with the jaws, and passing through orifices in the chair, and a neck connecting said arms below the chair, and an internally threaded sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws.

5. A chuck comprising an externally threaded head having a transverse longitudinal opening, a jaw chair loosely mounted in said opening and composed of two side portions and a base portion, said side portions having oppositely inclined jaw seats, while the base portion has arm-receiving orifices, jaws having inclined inner ends slidably mounted on said seats, a spring composed of resilient arms slidably engaged with the jaws and passing through the said orifices, and an internally threaded sleeve engaged with the head and having an internally tapered portion adapted to act on the outer ends of the jaws.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN A. LELAND.

Witnesses:

LIZZIE B. STRACHAN,

KATHERINE E. NICHOLS.