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W. H. JONES

2,626,812

TOOLHOLDER

Filed March 17, 1950

FIG. 1.

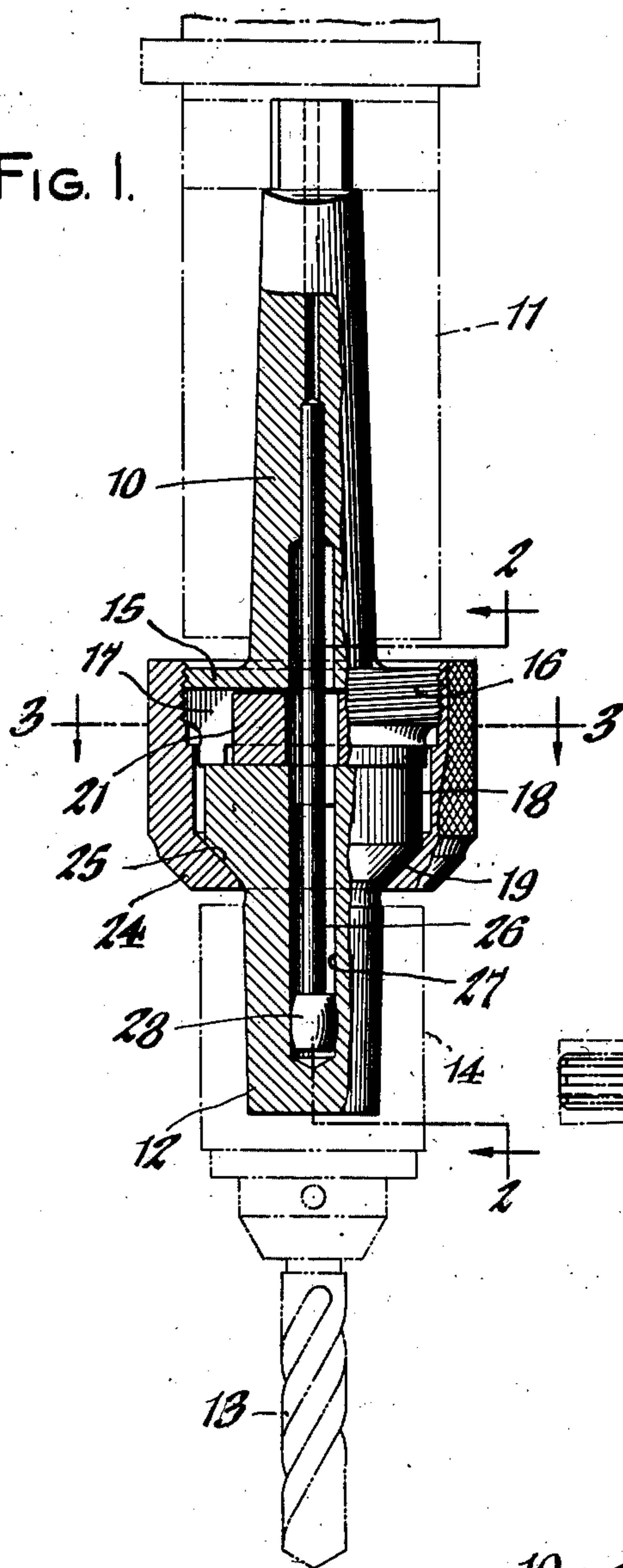


FIG. 2.

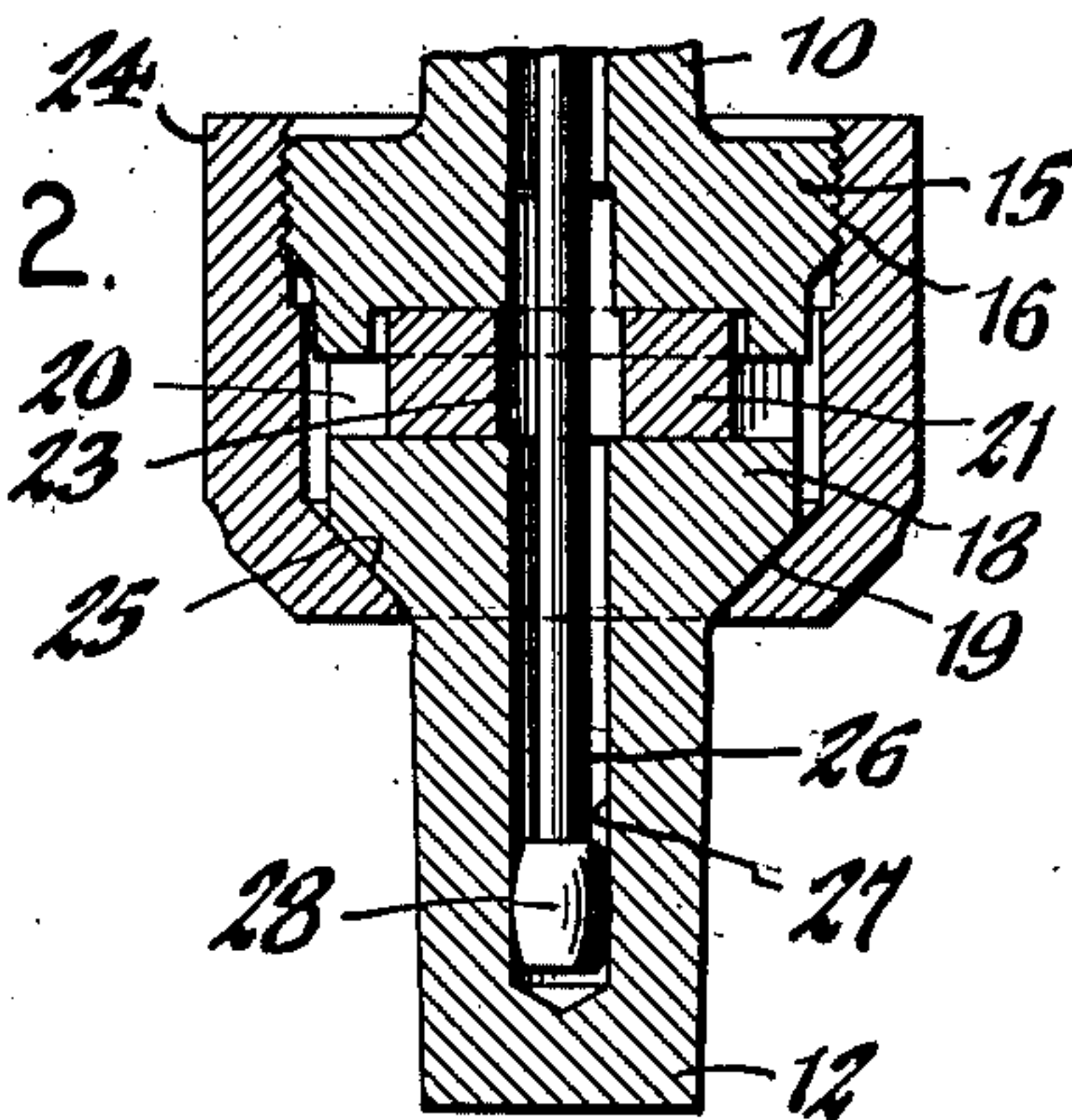


FIG. 3.

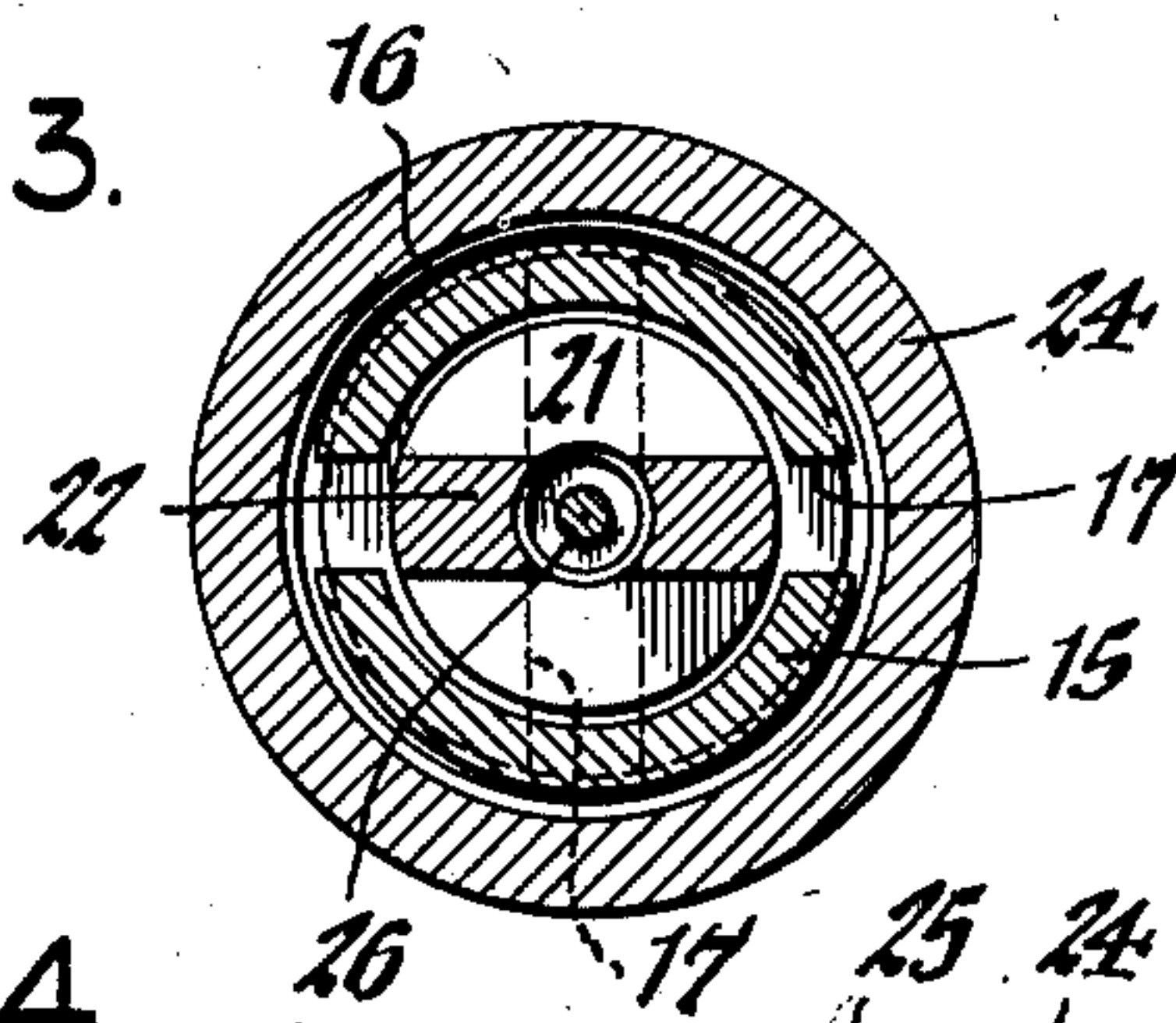


FIG. 4.

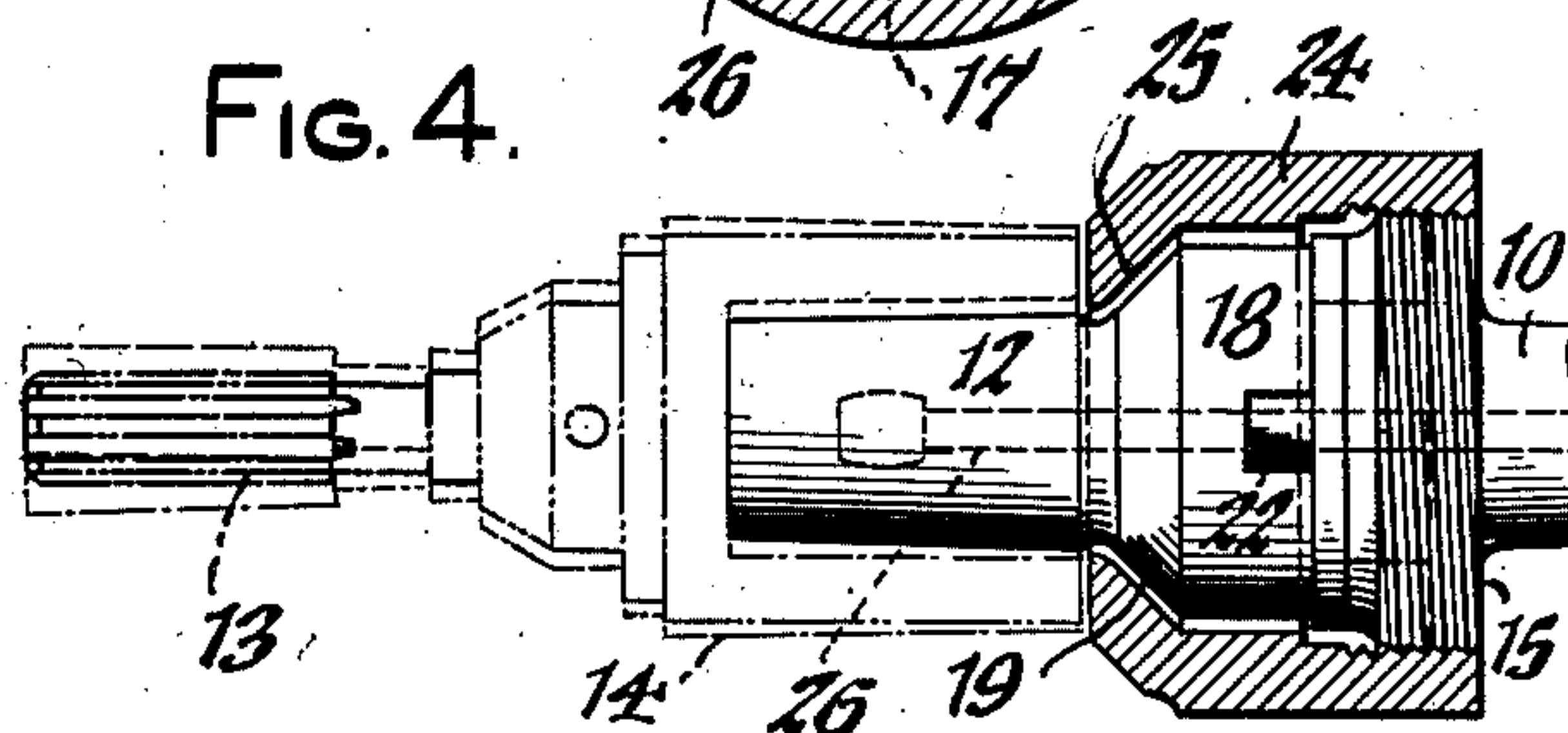
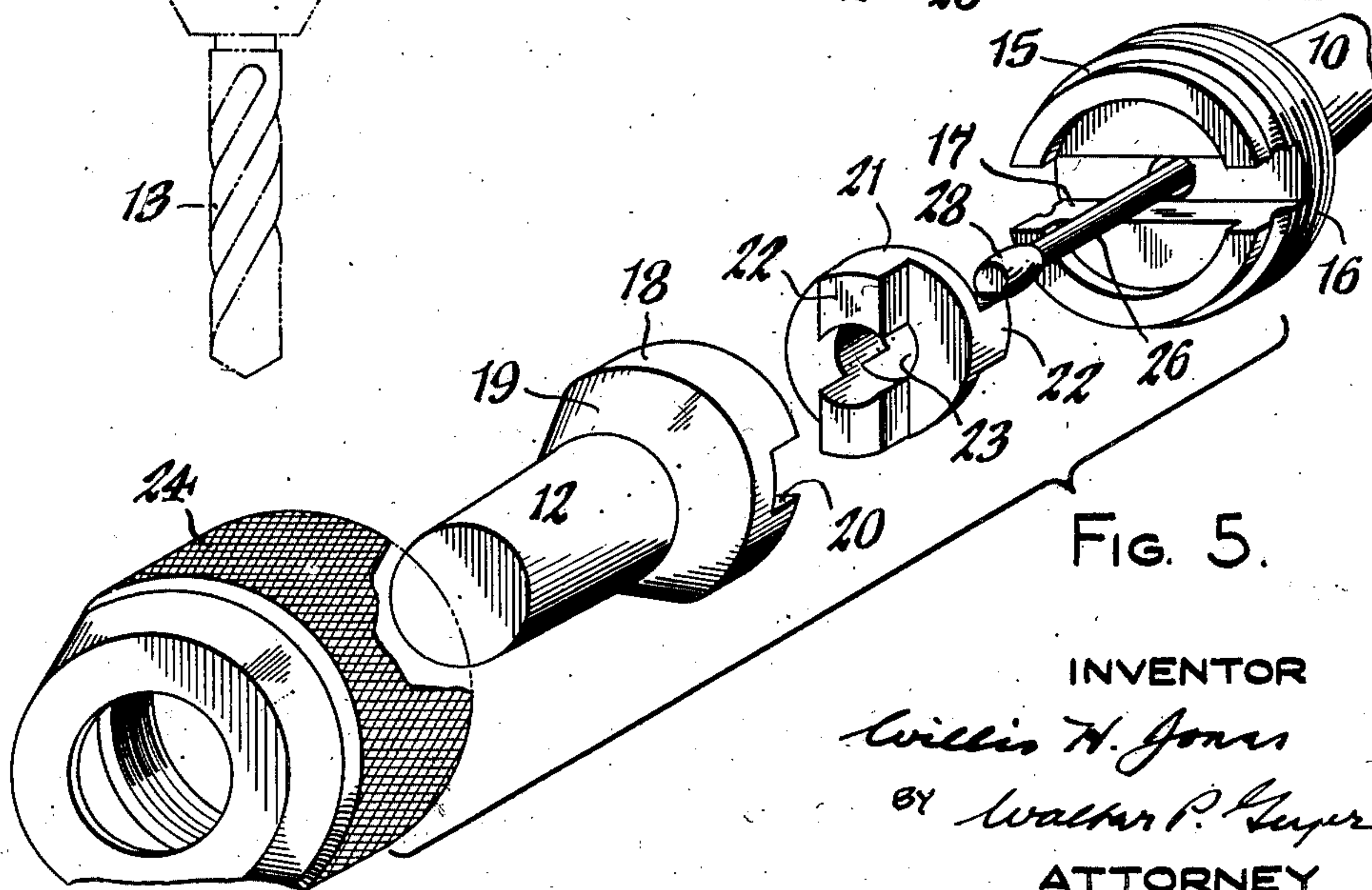


FIG. 5.



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TOOLHOLDER

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3 Claims. (Cl. 279—16)

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This invention relates to certain new and useful improvements in tool holders.

It has for its primary object to provide a tool holder which is so designed and constructed as to be selectively adjustable to retain the tool in a rigid position for drilling and like operations or to provide a floating action for the tool for reaming and similar operations.

Another object of the invention is to provide a combination rigid and floating holder of this character which is simple, compact and inexpensive in construction, which is self-contained for dual types of machine work and which can be quickly adjusted to accommodate a given tool operation, thereby affording a material saving in time and labor in the operation of the machines.

Other features of the invention reside in the construction and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a sectional elevation of the combination tool holder embodying my invention, showing the same in a rigid tool retaining position. Figure 2 is a fragmentary vertical sectional view, taken on line 2—2, Figure 1. Figure 3 is a cross section taken on line 3—3, Figure 1. Figure 4 is a fragmentary sectional view, similar to Figure 1, showing the holder in its floating tool holding position. Figure 5 is an exploded perspective view of the tool holder.

Similar characters of reference indicate corresponding parts throughout the several views.

In the preferred embodiment of my invention shown in the drawings, it consists of a driving stem or shank 10 which is adapted to be inserted and secured to the driving spindle 11 of the machine and an opposing driven stem or shank 12 to which a drill, reamer or like cutting tool 13 is adapted to be secured by a suitable chuck 14. The driving and driven shanks are adapted to be connected or coupled in such a manner that the tool can be rigidly secured in axial alignment with such shanks or the tool so supported as to have a limited floating or universal movement relative to such axis, to thereby provide a combination holder for quickly adapting it to one type of work or another.

For this purpose, the driving shank 10 terminates at its lower or outer end in a hollow or recessed cylindrical head portion 15 having external screw threads 16 thereon and having a transverse groove 17 in the recessed bottom face thereof in intersecting relation to its axis. The

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driven shank 12 terminates at its upper or inner end in an enlarged circular head 18 providing an external inclined or angular bearing face or shoulder 19 and having a transverse, diametrically-extending groove 20 in the upper face thereof, such groove being complementary to and opposing the groove 17 in the head portion 15 of the driving shank. A floating coupling member 21, in substantially the form of a disk, is disposed between the heads 15 and 18 of the driving and driven shanks and has lugs 22 on its opposing faces and at right angles to each other for transverse sliding and clutching engagement with the companion head grooves 17 and 20, respectively. Axially thereof the coupling member has an opening 23 therein. The parts 10, 12 and 21 are retained in their proper assembled relation by an adjustable sleeve-nut or barrel 24 which engages the threaded portion 16 of the head 15 in the manner shown in Figures 1, 2 and 4. This nut has an internal tapered or curved seat or shoulder 25 which is adapted to abut against the companion inclined external shoulder 19 on the head 18 to firmly retain and line up the parts in rigid coaxial relation for drilling and like operations, such position being shown in Figures 1 and 2. The internal diameter of the nut-bore is somewhat greater than the external diameter of the head 18 for a purpose which will presently appear.

To permit a floating action of the tool from the holder during reaming and like operations, the sleeve-nut 24 is loosened sufficiently to back its shoulder away from that of the driven shank-head 18. The coupling connection 21, under this condition, enables the driven shank 12 to have a limited lateral or angular displacement and floating action relative to the driving shank 10. For the purpose of floatingly-supporting the driven shank and limiting its angular displacement, I provide the driven shank with an axially disposed pin or spindle 26 pending therefrom, viewing Figure 1, which is fixed at one end thereto while its other end extends freely through the opening 23 in the coupling member 21 and freely into a bore 27 formed axially in the driven shank 12. This pin is capable of flexing and at its free end has a head 28 thereon which bears against the bore-walls and forms a bearing fulcrum about which the driven member is free to float in a limited angular fashion. Figure 4 shows the sleeve-nut adjusted for providing a floating support for the driven tool-bearing shank, the same being shown by way of example in a horizontal position for performing a reaming operation.

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While manifestly simple, compact and inexpensive in construction, this combination self-contained holder is efficient in operation and easy to manipulate, and it can be set in a minimum period of time to accommodate a rigid or floating tool operation and it eliminates the necessity of changing tool holders for different types of work.

I claim as my invention:

1. A combination tool holder, comprising opposing driving and driven members, a floating drive coupling operatively disposed between and for permitting a relative lateral displacement of said members, an outer sleeve-like coupling for connecting said members and said floating coupling into a unitary rigidly-alined assembly, and a flexible spindle-like element fixed to and pending axially from the driving member for lateral flexure relative thereto and extending axially and freely through said floating coupling member and into relative axial sliding and fulcruming bearing contact at its free end with said driven member.

2. A combination tool holder, comprising opposing driving and driven members, a floating coupling member disposed in rotative driving engagement between the opposing ends of said members, the driving member including an externally-threaded head and the driven member including a head having an external inclined shoulder thereon, a sleeve-nut engageable with said threaded head and having an internal inclined shoulder for engagement with the companion shoulder on the head of said driven member for connecting said several members into a unitary rigidly-alined assembly, and means constituting a floating and alining support for the driven member fixed to and extending axially from said driving member for lateral flexure relative thereto and to said coupling member and having a relative axial sliding and fulcruming connection with said driven member.

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3. A combination tool holder, comprising opposing driving and driven members, a floating coupling member disposed in rotative driving engagement between the opposing ends of said members, the driving member including an externally-threaded head and the driven member including a head having an external inclined shoulder thereon, a sleeve-nut engageable with said threaded head and having an internal inclined shoulder for engagement with the companion shoulder on the head of said driven member for connecting said several members into a unitary rigidly-alined assembly, said driven member having an axial bore therein and said coupling member having an alined opening therein, and a flexible pin fixed at one end to the driving member for lateral flexure relative thereto and extending axially therefrom and freely through the coupling member opening and freely into the driven member-bore and terminating at its free end in a head in relative axial sliding relation to and in bearing fulcruming contact with said bore.

WILLIS H. JONES.

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