May 6, 1947. G. FISHER 2,420,128

COLLET CHUCK

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FIG. 1.

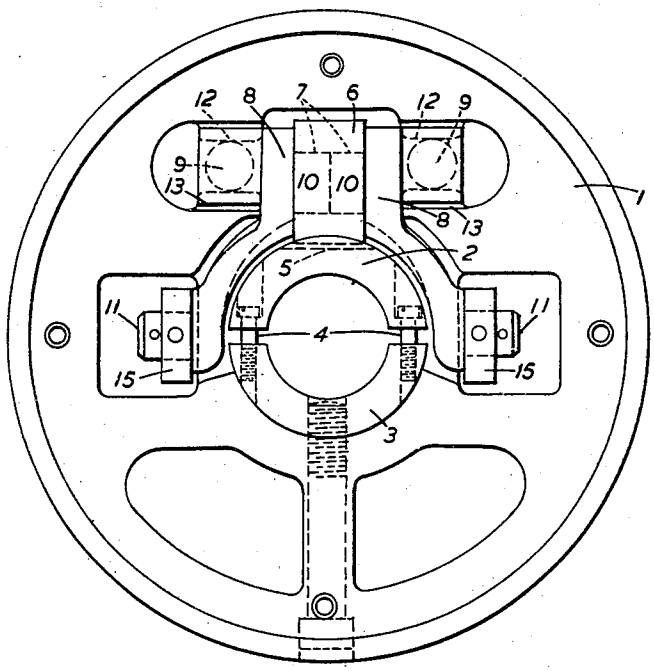
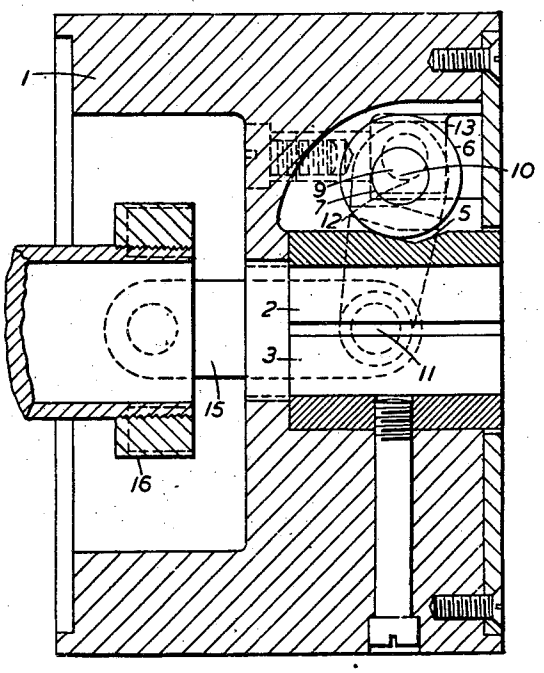


FIG. 2.



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FIG. 3.

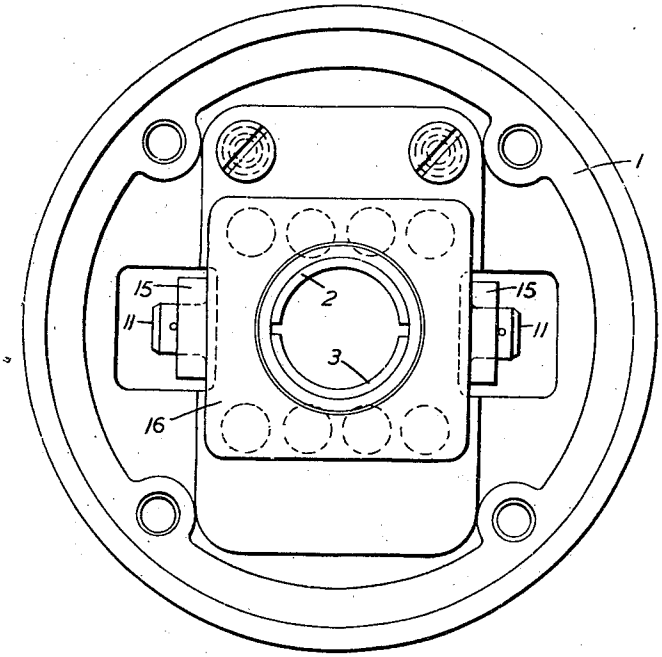
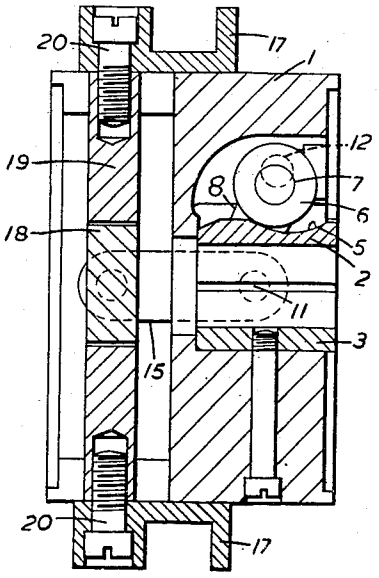


FIG. 4.



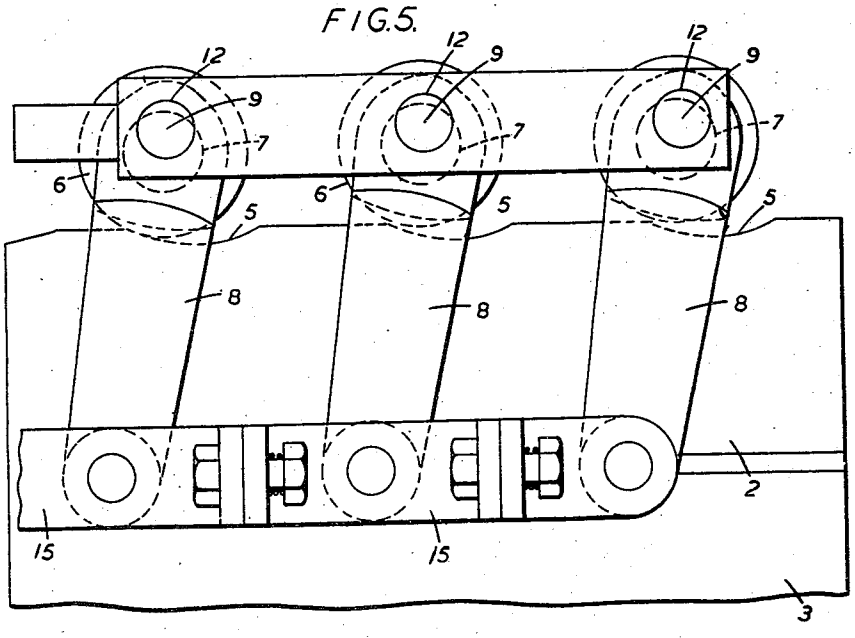
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COLLET CHUCK

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FIG.5.



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COLLET CHUCK

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Application August 4, 1944, Serial No. 548,032
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6 Claims. (Cl. 279—44)

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This invention relates to collet chucks more particularly for use on machine tools and the like and has for its chief object to provide a new or improved construction of collet chuck whereby an enhanced grip can be exerted upon the work held therein and provide a chuck which is easy to manufacture and at the same time effective in operation.

According to the invention the chuck is provided with two gripping collets or jaws one of which is fixed and the other adjustable relatively thereto. By providing a fixed collet or jaw the correct positioning and alignment of the work in the chuck is ensured and the adjustable collet jaw maintains the work in a fixed position relative to the fixed collet or jaw whose position is known.

In order that the invention may be clearly understood and readily carried into effect the same will now be more fully described with reference to and by the aid of the accompanying drawings, wherein:

Figure 1 is a front elevation of the chuck with the cover plate removed.

Figure 2 is a half sectional elevation of Figure 1.

Figure 3 is a rear elevation of Figure 1.

Figure 4 is a sectional elevation of a chuck with a modified form of draw mechanism.

Figure 5 is a diagrammatic view showing a chuck modified for multiple gripping.

Referring to the drawings, the chuck comprises a housing or body 1 which carries a pair of collet jaws 2, 3 one of which is fixed relative to the housing or body 1. Each collet or jaw will be semi-circular on its outer surface or edge and will be ground in the bore and on the outside diameter. They will be held in pairs by cheese-head screws 4 and retained apart by suitable springs.

The adjustable collet or jaw 2 is radiused or inclined at 5 on its upper surface to provide a seating for the locking roller 6 carried by pins or studs 7 on the locking levers 8. Alternatively a slipper (not shown) may be inserted between the adjustable collet or jaw 2 and the locking roller 6 so that the roller does not bear directly upon the collet 2 with the result that the latter need not be radiused or inclined. The locking levers 8 operate on the second principle of levers wherein the fulcrum 9 is at one end of each lever and the load is adjacent thereto at 10 between the fulcrum and the operating point 11. Preferably the locking levers 8 are made in two halves, the points 10 at which the locking load

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is applied being on each side of the collet and to effect this the levers 8 are arched to pass around the collet. The other ends of the levers affording the fulcrum 9 are provided with studs 12 which engage bearings 13 secured within the chuck body 1, while on the inner side of each lever are the complementary studs 7 which carry the roller 6 bearing upon the adjustable collet 2. The locking load is applied to the ends of the levers adjacent to the collets through the medium of a pair of links 15, each link being connected to a draw plate 16 which is adjustable for tightening or releasing the collets.

The draw plate may be spring loaded if desired, so as to make the chuck self gripping with a predetermined load.

It will be seen that by operating the collet through the medium of lever and link mechanism of the character described the force applied to the collet for a given result is so multiplied that a firm gripping action is possible at the collets, which is further enhanced by reason of the gripping area of the collets being practically circumferential relative to the work.

In the event of the mounting of the chuck being such that a draw tube or bar cannot be fitted, the links 15 may be operated by means of a ring 17 which encircles the housing 1 as shown in Figure 4 and the links 15 are withdrawn by means of the ring 18 and block 19 which is secured to the ring 17, by the stud 20.

In view of the collets 2, 3 being of semi-circular shape there is little likelihood of dirt and swarf penetrating into the chuck and due to the fact that one collet is fixed relative to the chuck body no dirt can penetrate behind this jaw and the operator can be certain that the work is held in correct adjustment against the fixed collet, also there can be no lateral movement of the work as the adjustable collet or jaw moves radially. The internal gripping surfaces of the collet may be of any desired shape in formation to suit the work to be gripped in the chuck and the chuck is applicable to any machine tool where there is no hollow spindle. The chuck can be made to grip discs, threaded work, tapers and eccentrics and can be arranged for multiple gripping by either having a plurality of chucks in line or by lengthening the collets or jaws as shown in Figure 5 in which case a plurality of locking levers 8 and locking rollers 6 will be provided to bear against the adjustable collet or jaw 2 either directly or indirectly. The plurality of locking levers 8 may be arranged in

tandem and be connected by a pair of links 15 connecting them together.

I claim:

1. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves each correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon a cam surface on the adjustable collet or jaw.

2. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon the adjustable collet or jaw, and links connected with the chuck operating mechanism for actuating said levers.

3. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves each correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon the adjustable collet or jaw, and links connected with the chuck operating mechanism for actuating said levers, at least two pairs of operating levers being provided to operate the adjustable collets or jaws.

4. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon the adjustable collet or jaw, and a remote control including a pair of links each connected to a draw plate for applying a locking load to the ends of the levers adjacent the collets or jaws.

5. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon the adjustable collet or jaw, links connected with the chuck operating mechanism for actuating said levers, and means for operating the links while the chuck is in motion.

6. A collet chuck comprising in combination a pair of gripping collets or jaws, one fixed and the other adjustable relatively thereto, a system of levers for adjusting the adjustable collet, the levers being in two halves correspondingly mounted on either side of the collets or jaws and carrying a roller which bears upon the adjustable collet or jaw, links connected with the chuck operating mechanism for actuating said levers, and a ring encircling the housing for the collets or jaws connected by means of a block and ring to the first mentioned ring and the said links, respectively, for operating the levers adjacent the collets while the chuck is in motion.

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