July 28, 1959 C. E. STRAUSS 2,896,958

WORK HOLDING JAWS FOR CHUCKS

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FIG. 1.

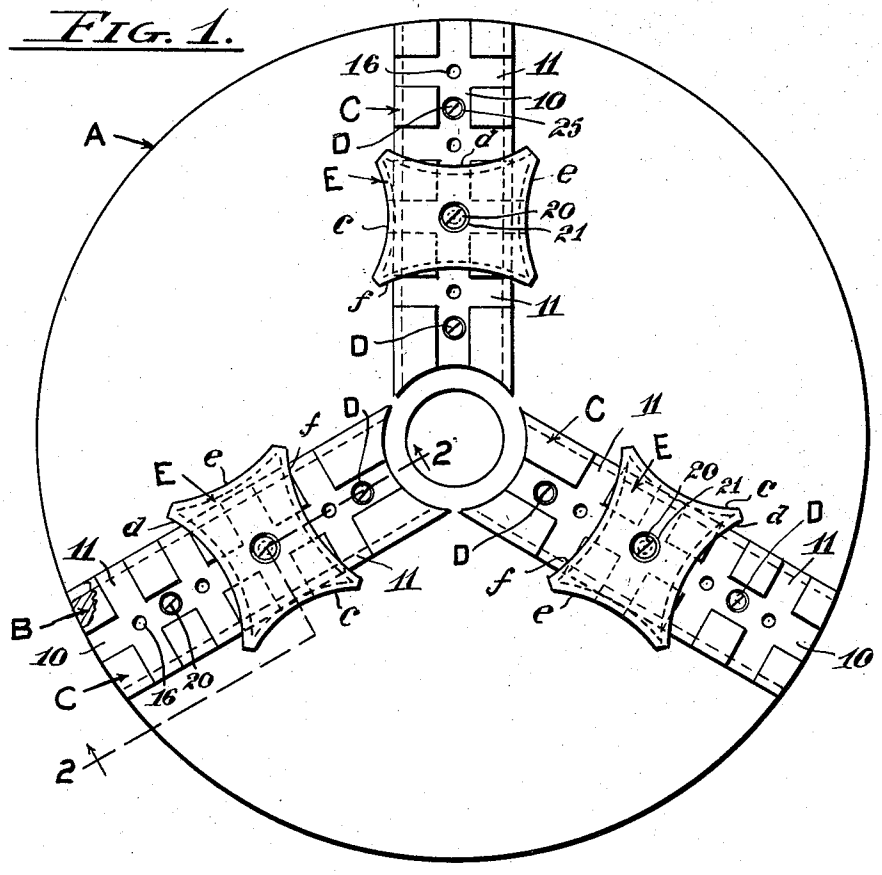


FIG. 2.

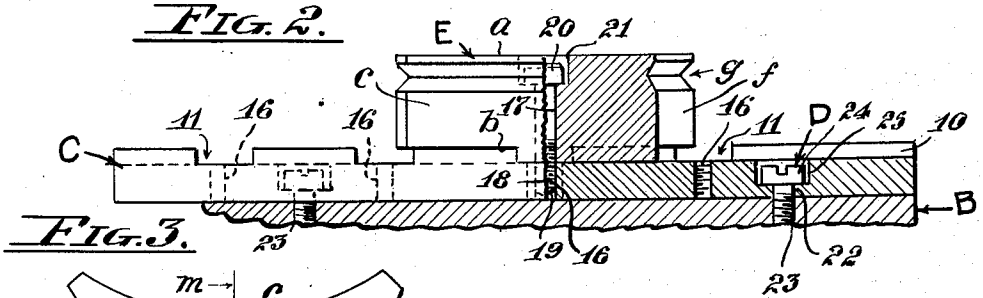
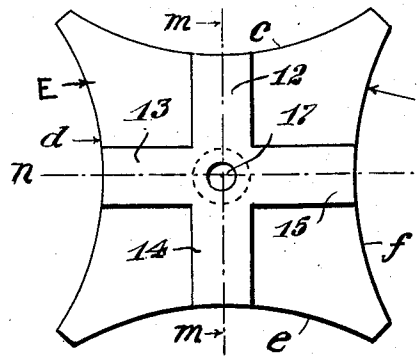


FIG. 3.





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FIG. 4.

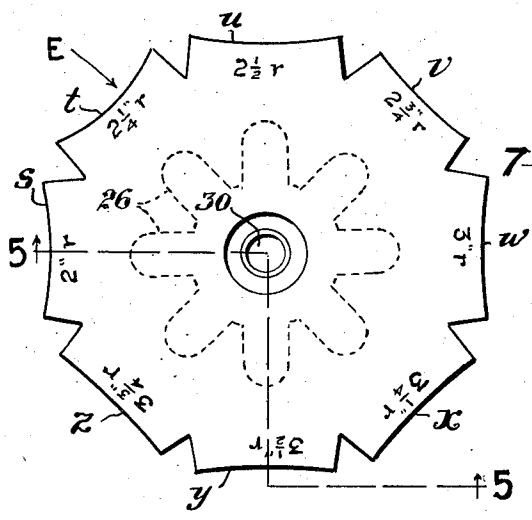


FIG. 6.

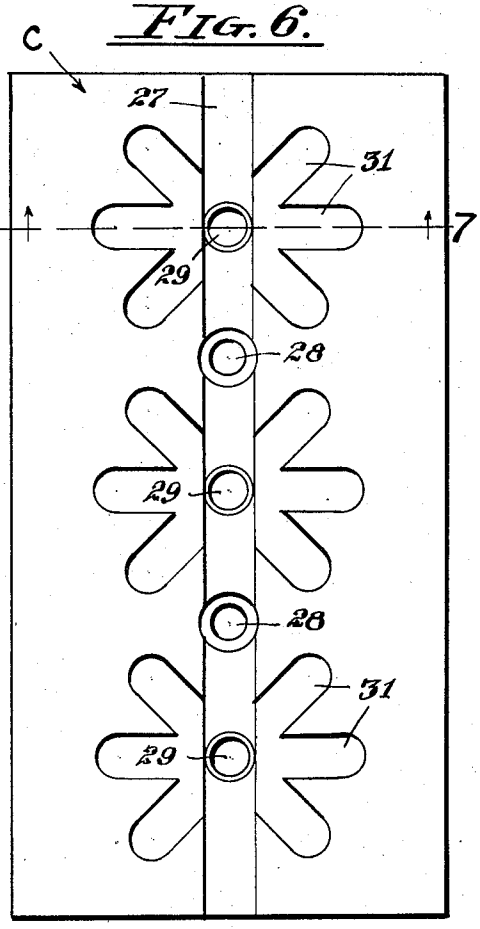


FIG. 5.

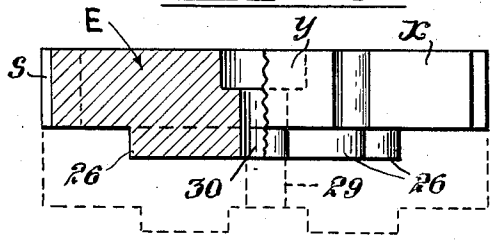


FIG. 8.

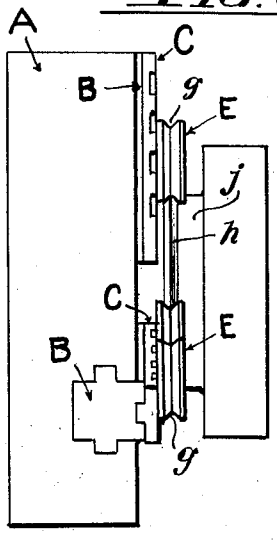
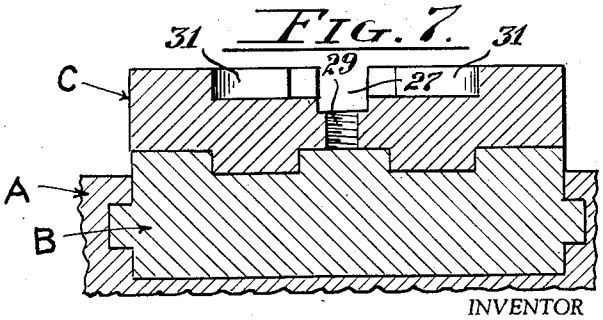


FIG. 7.



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2,896,958

WORK HOLDING JAWS FOR CHUCKS

Charles E. Strauss, Santa Barbara, Calif.

Application June 23, 1958, Serial No. 743,530

5 Claims. (Cl. 279—123)

This invention relates to a chuck and particularly pertains to work holding jaws for attachment to the master jaws of conventional chucks commonly employed in turret lathes.

The primary object of the invention is to provide working jaws having a wide range of adaptability for gripping engagement with cylindrical elements of various diameters with a considerable area of circumferential contact between the jaws and a cylindrical element engaged thereby.

The invention generally considered resides in the provision of an adaptor attachment to the master jaw of a chuck together with a work engaging jaw for positioning on the adaptor with the adaptor and jaw having cooperating interengaging means whereby the jaw may be fixed on the adaptor at various positions longitudinally thereof to dispose the gripping surface of the jaw in various spaced relation to the center of the chuck so as to accommodate the jaws for engagement with cylindrical elements of various diameters.

The invention further resides in a work engaging jaw having a series of arcuate gripping surfaces of varying radii together with a mode of mounting the jaw on an adaptor so that any one of a series of gripping surfaces on the jaw may be presented to the work to be gripped, whereby a particular arcuate gripping surface may be selected for engagement with the cylindrical surface to conform thereto.

With the foregoing objects in view together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts hereinafter described and claimed, and as illustrated by way of example in the accompanying drawings in which:

Fig. 1 is a view in front elevation of a chuck showing the invention as applied;

Fig. 2 is an enlarged detail in section and elevation as seen on the line 2—2 of Fig. 1 showing the manner of mounting jaw on an adaptor and of mounting the adaptor on the master jaw of a chuck;

Fig. 3 is a view in rear elevation of the chuck jaw depicted in Fig. 2, showing it detached;

Fig. 4 is a view in front elevation of a modified form of the chuck jaw;

Fig. 5 is a view in section and elevation as seen on the line 5—5 of Fig. 4;

Fig. 6 is a view in elevation of an adaptor as constructed to receive the jaw shown in Figs. 4 and 5;

Fig. 7 is a view in cross section as seen on the line 7—7 of Fig. 6 showing the adaptor as applied to the master jaw of a chuck; and

Fig. 8 is a view in side elevation of the chuck shown in Fig. 1 illustrating the mode of operation thereof in gripping an object to be worked.

Referring to the drawings more specifically wherein corresponding reference characters are employed to designate corresponding parts throughout the several views, A indicates generally a conventional chuck fitted with

radially extending master jaws B adapted to be adjusted longitudinally and radially of the chuck A in the usual manner by means not necessary to be here shown.

In carrying out the invention an adaptor C is fixedly mounted on the master jaw B as by means of screws D. The adaptor C serves as a mounting for a demountable jaw E which jaw is designed to be supported on the adaptor C at any one of several points along the length thereof and also to be adjusted and fixed on the adaptor C to present any one of the various sides of the jaw toward the inner end of the adaptor and thereby be presented toward a line extending axially of the chuck A, as will presently be described.

In the construction shown in Figs. 1 to 3 inclusive and also in Fig. 8, the jaw E comprises a metal block having parallel top and bottom faces *a* and *b* and having four longitudinally concave arcuate sides *c*, *d*, *e* and *f* constituting independent work gripping surfaces. The faces *c*, *d*, *e* and *f* are here shown as formed with longitudinal V-grooves *g* for effecting engagement with corresponding contoured ribs *h* formed on a cylindrical element *j* to be engaged by the jaws E as shown in Fig. 8 and in the manner set forth in United States Letters Patent No. 2,309,260. However the gripping faces of the jaws may be contoured in any suitable manner such as by forming them with any of the various types of serrations commonly employed in chuck jaw construction. The arcuate faces *c*, *d*, *e* and *f* are respectively formed on arcs struck from radii of different lengths and which radii may be of any suitable dimensions, for example the face *c* may be formed on arc having a radius of two (2) inches, while the faces *d*, *e* and *f* may be formed respectively on radii of two and one-fourth (2¼), two and one-half (2½) and two and three-fourths (2¾) inches. The opposed concave faces *c* and *e* extend on arcs the radii of which are struck from diametrically opposed points on a line leading through the axis of the jaw E, and the opposed concave faces *e* and *f* extend on arcs the radii of which are struck from diametrically opposed points on a line leading through the axis of the jaw perpendicular to the line from which the radii of the faces *c* and *e* are struck.

Interengaging means are provided on the adaptors C and jaws E for positioning the jaws E on the adaptors with either of the arcuate faces *c*, *d*, *e* and *f* presented toward the work to be gripped by the jaws at the inner end of the adaptor. This means is here shown as embodying an arrangement of channels on the upper face of the adaptor C and a complementary arrangement of ribs on the bottom faces of the jaws E; each adaptor C having a central longitudinal channel **10** extending throughout the length thereof together with a series of spaced transverse channels **11** opening at the sides of the adaptor and intersecting the longitudinal channel **10** and which channels **10—11** are of rectangular cross section and correspondingly dimensioned and each jaw E having on its bottom face a series of four complementary equispaced radial ribs **12**, **13**, **14** and **15**, which are coplanar and of rectangular cross section and dimensioned to slidably fit the channels **10—11** on the adaptor. The outer ends of the ribs **12**, **13**, **14** and **15** terminate at the margins of the jaw.

The radial ribs **12**, **13**, **14** and **15** intersect at their inner ends with the ribs **12—15** longitudinally opposed, as are the ribs **13—15** and with the axes *m—m* of the ribs **12—14** extending diametrally of the jaw in perpendicular relation to the axes *m—n* of the jaws **13—15**, as indicated in Fig. 3.

The opposed arcuate faces *c* and *e* are here shown as formed on arcs the radii of which are struck from points on the axial line *m—m* spaced outwardly from the jaw and the opposed faces *d* and *e* are shown as formed on

arcs the radii of which are struck from points on the axial line *n—n* spaced outwardly from the jaw, whereby the axes of the ribs **12, 13, 14** and **15** intersect the arcuate faces *c, d, e* and *f* respectively midway of the ends of such faces.

This relative arrangement is illustrated in Fig. 3 as to the arcuate face *f* wherein the radius of such face is indicated by the broken line *r* and the point of such radius on the center line *n—n* is indicated at *p*, the faces *c, d* and *e* being similarly defined.

The adaptor C has a threaded screw receiving hole **16** at the intersection of the axes of the channels **10—11** and each of the jaws E has an unthreaded axial bore **17** to receive a bolt **18** having a threaded end **19** adapted for engagement with any of the holes **16** and having a head **20** engageable with the bottom of a recess **21** in the top face *a* of the jaw, such bolt being employed to tightly clamp the jaw on the adaptor with the several ribs on the jaw engaged in certain of the channels **10—11** on the adaptor.

In the operation of the invention as above described, the adaptors C are mounted on the master jaws B by seating them on such jaws and attaching them thereto by the screws D which are passed through openings **22** in the adaptor and engaged with threaded openings **23** in the master jaws, which screws have heads **24** which seat on the bottoms of recesses **25** in the adaptors. The jaws E are mounted on the adaptors either before or after the latter are attached to the master jaws in the manner above described; the several jaws being arranged on the several adaptors with corresponding arcuate gripping faces thereof presented toward the inner ends of the adaptors as shown in Fig. 1, the jaws being selected and selectively arranged according to the diametrical dimensions of the work to be engaged thereby. For example if the work *j* to be engaged has a cylindrical surface to be gripped extending on an arc the radius of which has a length of two inches then a set of jaws E is selected wherein each jaw has an arcuate gripping face the radius of which is two inches and the set of jaws are mounted on the several adaptors C and arranged thereon with the appropriate arcuate gripping face presented to the portion of the work to be gripped in close proximity thereto, each of the jaws E being located on its associated adaptor with the ribs **12, 13, 14** or **15** thereon leading from the forwardly presented gripping face, disposed in the longitudinal channel **10** of the adaptor, and with the then transverse ribs on the jaw E engaged in the particular transverse channels **11** of the adaptor which will dispose the jaw in proximate spaced relation to the member to be gripped. The master gear B is then adjusted in a usual manner to bring the assembly of jaws E into gripping engagement with the portion of the work to be gripped.

In the form of the invention shown in Figs. 4 to 7 inclusive, the adaptor C and the jaw E are designed to afford a greater number of gripping faces having arcs of different radii than in the construction shown in Figs. 1 to 3 inclusive. As here shown, the jaw E has a series of eight independent arcuate faces *s, t, u, v, w, x y and z*, said faces being formed on radii ranging from two inches in length to three and three quarters inches in length with one-fourth inch differential between adjacent arcuate faces. The bottom face of the jaw E is formed with a series of equi-spaced radial ribs **26** with the axis of each of such ribs extending on a radial plane leading from the center of the jaw through the arcuate faces intermediate the ends thereof.

The adaptor C in this instance has a central longitudinal channel **27** in which is a pair of bolt holes **28—28** for the reception of bolts by which the adaptor is fastened onto a master jaw B in the manner before described. The adaptor is also formed with a series of threaded screw receiving holes **29** spaced longitudinally in the channel to receive a screw by which the jaw E is securely but removably attached to the adaptor in the manner before described, the jaw E having a central screw receiving opening **30** for the reception of a screw which is passed through the jaw E and engaged with one of the holes **29**.

Radiating from each of the holes **29** is a group of equi-spaced radial channels **31** adapted to snugly but removably receive the several ribs **26** of the jaw E shown in Figs. 4–5, any one of the channels **31** being capable of receiving any one of the ribs **26** whereby the jaw may be seated in either of the groups of channels **31** to present either of the arcuate jaws thereon to the inner end of the adaptor.

The arcuate faces are here shown as blank but are subject to being worked to provide gripping surfaces according to requirements.

Manifestly the mode of operation of the construction shown in Figs. 4 to 7 inclusive is the same as that described with reference to the construction shown in Figs. 1 to 3 and 8.

While I have shown and described specific embodiments of the invention, I do not limit myself to the exact details of construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

I claim:

1. A chuck jaw attachment for the master jaw of a chuck comprising an adaptor, means for connecting said adaptor to a master jaw, said adaptor having an upper face with channels therein, a jaw member having a bottom face, ribs on said bottom face engageable in said channels, said jaw member also having an axial bolt hole, a bolt in said hole having threaded engagement with said adaptor, and a plurality of longitudinally concave arcuate marginal work engaging faces on said jaw member adjacent of which extend on arcs the radii of which are of different lengths.

2. A chuck jaw attachment for the master jaw of a chuck comprising an adaptor, means for detachably connecting said adaptor to a master jaw, said adaptor having an elongated upper face having a plurality of groups of cross channels therein, a jaw member having a bottom face, radial ribs on said bottom face engageable in any one of the groups of channels on said adaptor, means detachably connecting said jaw to said adaptor with said ribs engaged in said channels, and a plurality of longitudinally concave arcuate marginal work engaging faces on said jaw member adjacent of which extend on arcs the radii of which are of different lengths.

3. In a chuck jaw attachment for the master jaw of a chuck, an adaptor having an elongated upper face having therein a plurality of groups of radially related channels and having an inner end, means for detachably connecting said adaptor to a master jaw, a jaw member having a bottom face, a plurality of longitudinally concave arcuate marginal work engaging faces on said jaw member adjacent of which extend on arcs the radii of which are of different lengths, radial ribs on said bottom face engageable in any one of said groups of channels, there being one of said ribs associated with each of said arcuate faces the longitudinal center of which extends on a plane leading mid-way of the ends of the associated arcuate face, said ribs being engageable with said channels to position said jaw with either of the arcuate marginal faces thereof presented toward the inner end of said adaptor, and means for detachably connecting said jaw to said adaptor at either of said groups of radially related channels.

4. The structure called for in claim 3 in which said last named means comprises a threaded hole in said adaptor at the center of each of said groups of related channels, an axial bolt receiving hole in said jaw member, and a bolt passing through the hole in said jaw

member and screwed into engagement with a selected one of said threaded holes in said adaptor.

5. An attachment for the master jaw of a chuck comprising an adaptor having an upper face and an inner end, a jaw member having a bottom face and having a plurality of longitudinally concave arcuate marginal work engaging faces, radial ribs on said bottom face, said adaptor having channels on its upper face for the reception of said radial ribs, and means for detachably connecting said jaw to said adaptor with said ribs and channels interengaged, said ribs and channels being arranged relative to each other and to the concave arcuate faces so as to present an arcuate face in the direction of the inner end of said adaptor when said ribs and channels are interengaged.

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