

planed out parallel to some exact standard size—say $\frac{1}{8}$ in. larger than the nominal size of the bolt—in order that various attachments (such as angle plates, V-blocks, etc.) may be accurately guided in position. For obvious reasons, the pinholes in a planer table should also be of standard size.

The remarks in the last paragraph apply with equal force to the tables of shapers, slotters, milling machines, drill presses, and other tools requiring their work to be bolted to a flat surface. Other things that need bringing to a standard size are the "arbors" of milling machines and gear cutters, where the cutters are put on. It is much to be regretted that even the most scientific makers of these cutters provide them with so many-sized holes that a constant recourse to bushings is necessary. Such a bushing is a very annoying little pet, especially if it is $\frac{1}{8}$ in. or so thick, and must contain a key seat to fit over the feather in the arbor, and a feather of its own to drive the cutter. Is there any earthly reason for the atrocious wickedness of putting three different-sized holes in a set of gear-tooth cutters, varying from five to ten diametrical pitch, except a romantic desire to make said holes somewhat in proportion to the outside size of the cutter? And why do the cutters need to have so many outside diameters—who knows?

AN UNIVERSAL DOME CHUCK.

(For Illustrations, see *Lithograph Supplement*.)



WE are indebted to the maker of the chuck, herewith illustrated, for the privilege of placing a description of it before our readers. The photographs are from a chuck made from ideas suggested by Mr. Jesse Lowe, of medallion cutting fame. The embodiment of the ideas has been most successfully accomplished by an accomplished amateur, who is an ardent supporter of "Amateur Mechanics." Of the workmanship we may safely say that it is unexcelled, and from it some of our so-called practical mechanics might take a lesson in imitation with benefit to their trade. Having spent some hours in looking through the work produced by the gentleman alluded to, we speak with every confidence.

Our correspondent wrote: I am pleased to notice the appearance of your magazine, and consider that it supplies a want that amateurs have long felt. The excellent style in which you send out the magazine with the edges ready cut, the good paper, clear type, and real working drawings, are each deserving special eulogy. I think we should all do what we can amongst ourselves to render the work as interesting as possible to each other. Most likely every reader could supply some scrap of information that would be valuable to a large proportion of his fellow readers. We, amateurs, work so much alone that our ideas are often quite peculiar to ourselves. By interchanging them we cannot but profit mutually. As a practical proof in endorsement of my views I herewith send you photographs of a compound dome chuck.

This compound dome chuck enables the amateur to do much work that cannot be done on dome chucks of ordinary construction, and it will also do much of the work that usually has to be done by the spherical slide-rest. It will be found a useful addition to any amateur's outfit. The chuck is not difficult to make, and from the illustrations the reader will be able to infer an idea of its general construction. The main slide, at right angles with the mandrel axis, is precisely like that of the ordinary dome chuck. Instead of a solid sliding piece, as in the ordinary arrangement, this piece of this chuck

rotates at its base, near the face of the arm. For this purpose it is provided with a worm wheel and tangent screw micrometer adjustment, as shown in the photographs. By this arrangement the work may be readily thrown at an oblique angle with the line of centres. The sliding piece is forked at the end, and the nose piece is gunballed to swivel at right angles to the former motion. That is, when the micrometer wheel is in its normal position the nose piece may be swivelled at right angles to the mandrel axis, so that the work may be brought to stand out in a line parallel to the mandrel if wished.

This portion is also indexed on the underside, which enables the user to readily set it at any desired angle; unfortunately, this is not shown in the photos. The working of this movement could also be done with a segment of a worm wheel, and tangent screw; but in practice this arrangement is not found so good or so convenient as the one shown. To work this movement you slacken the two studs upon which the nose-plate revolves—half a turn will be found sufficient—when the work can be readily fixed at the desired angle. Then, of course, the two studs are again screwed home, and this portion of the chuck is as solid as if the fork and nose-plate were of one piece—the importance of which I am sure all who have had any experience in the use of the dome chuck will bear me out, as the jar is sometimes considerable.

The detent wheel shown is held by the three screws, but is made interchangeable, so that detent wheels variously divided may be used in accordance with the requirements of the work in hand. By means of the two steady pins, shown in the face of the detent wheel, which are fixed in the base of the nose piece, any other detent wheel may be readily centred. The spiral, eccentric, and other chucks should be fitted in exactly the same manner, so that any wheel will fit on either chuck. This plan gives the advantage of a long range of divisions without necessitating the use of the slow working micrometer screw arrangement. Of course this system of interchangeable detent wheels is available for all kinds of ornamental chucks and apparatus, and does not necessarily form part of the improved dome chuck, which I have briefly described.

These index wheels are so figured and marked as to read at sight—an arrangement which I am certain will be appreciated by all who use them, more especially those unfortunate individuals who happen to be short sighted. This arrangement will also be found very beneficial if applied to the division plate of a lathe, the proof of which I can vouch for from experience. The sub-dividing of index wheels was suggested to me by a *very clever* amateur, hailing from the Lake district, and whose ideas I should be pleased to see occasionally appearing in "Amateur Mechanics."

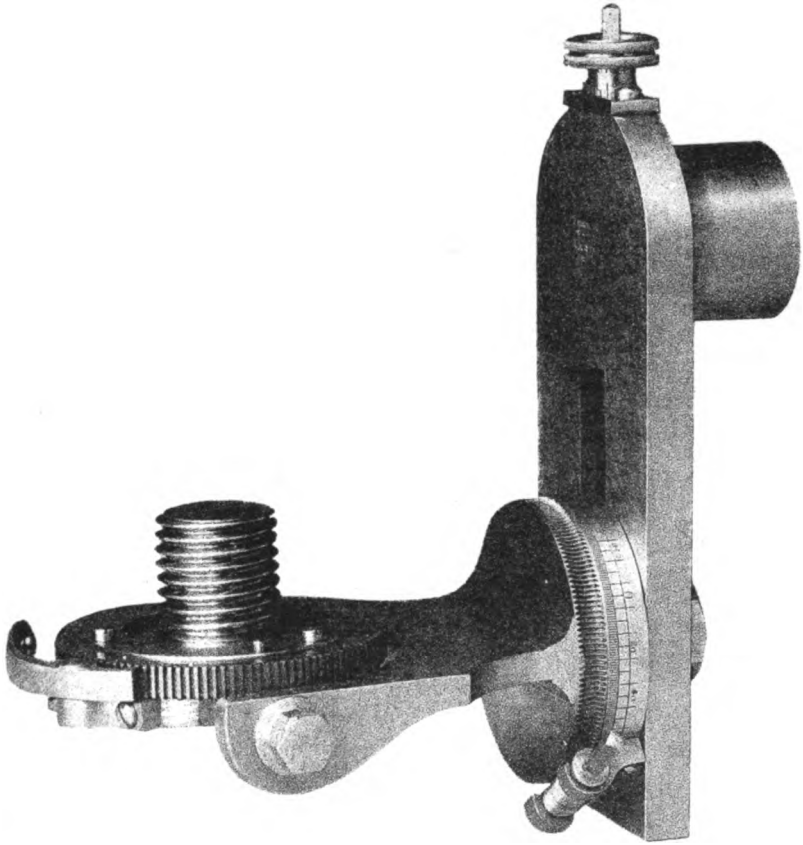
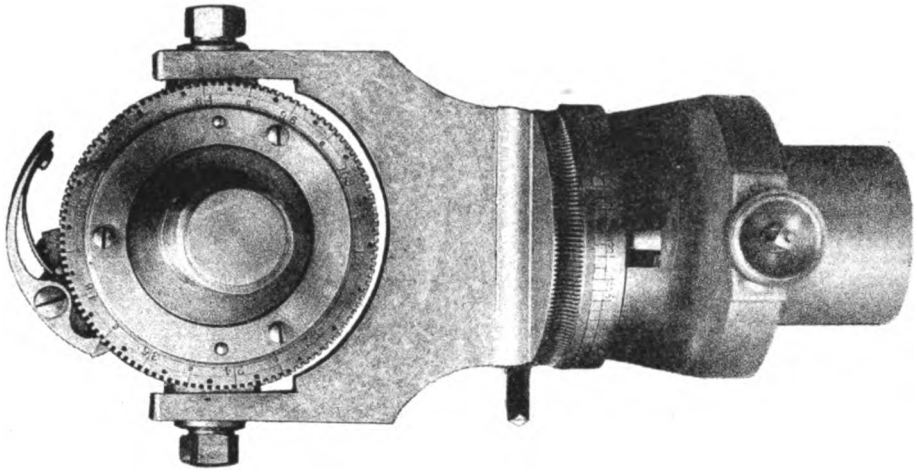
It is only due to say that I am indebted to Mr. Jesse Lowe, who originally invented the chuck many a year ago, for the idea here embodied, and in his generous unassuming manner he has kindly consented to the publication of these particulars.

In conclusion, I may add that the chuck is made throughout with the Whitworth pitch of thread with the single exception of the main screw, and it may not be out of place here to mention, that I should like to see the screw pitch question thoroughly ventilated in "Amateur Mechanics," as I, for one, think the time has come when the use of none but aliquot pitches should be permissible.

G. B. M.

It only remains for us to thank our correspondent for the trouble he has taken, and to express a hope that others amongst our readers will follow the good example he has set.

AMATEUR MECHANICS.



FROM A PHOTO BY THE MANCHESTER PROTOTYPE CO.

UNIVERSAL DOME CHUCK.

"INK-PHOTO," SPRAGUE & CO., LONDON.