PRACTICAL MECHANISM.

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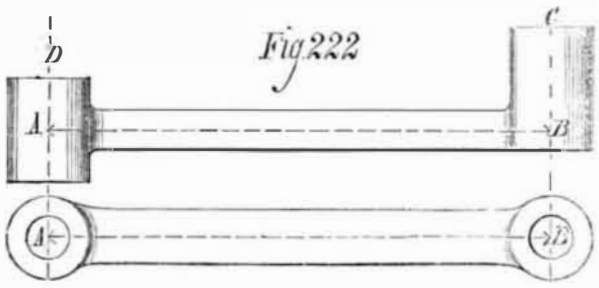
TO MARK OFF THE DISTANCE BETWEEN THE CENTERS OF TWO HUBS OF UNEQUAL HIGHT.

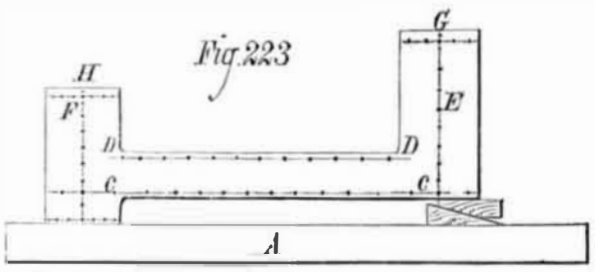
When the hights of two hubs are unequal, as shown in Fig. 222, the distance required being that from A to B, we must make the necessary allowance (in the distance at which we set the compass or trammel points) for the difference in

Fig. 222



hight of the surfaces upon which our circles are to be marked, from the body of the lever or arm. If the arm is to be finished along its whole length, it is better to mark off the body of the arm first, which we perform as shown in Fig. 223. Setting our work upon the table, A, and wedging it as shown, we mark off with the scribing block the lines, C C

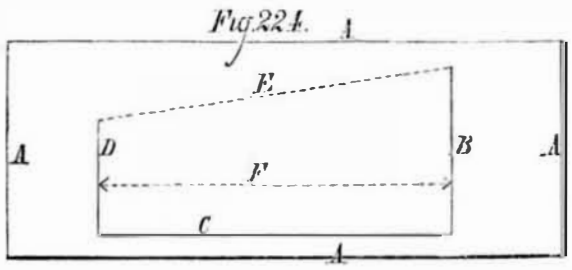
Fig. 223



and D D, making their distance apart the thickness of stem required, and leaving about an equal amount of metal to be taken off each face. We then mark off the hight of each hub face, measuring from the line, C, and scribe a line around each hub face as far as the scriber point will allow. We next mark off (with a square, resting against the surface of the marking-off table) the lines, E and F, marking them as near the center of the hub as the eye will direct: their use being simply as guides in setting the work in the lathe or machine. These lines being dotted with a fine centerpunch, to prevent their becoming obliterated, we next measure the hight of the face, G, and that of the face, H, both from the line, C.

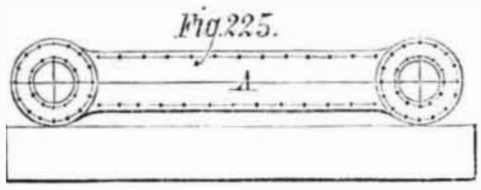
We now turn to the marking-off table, and on its surface draw a straight line a little longer than the length of our arm or lever, as shown in Fig. 224, the lines, A A A A, representing the outline of the marking-off table, the line, B, representing the hight of the hub from its surface, G, to the

Fig. 224.



line, C, in Fig. 223, and the line, B, representing the hight of the hub from its surface, H, to the line, C, in the same figure. The two lines, B and D, are to be struck at right angles to the line, C, and the distance between them (as denoted by the dotted line, F) being the required distance from center to center of our lever. These lines being drawn, we have only to set our compass or trammel points to the length of the dotted line, E, to be able to mark off the correct distance apart for the centers of the circles to be marked on the faces of the two hubs. Proceeding, then, we place our lever on the marking-off table in the position shown in Fig. 225; and

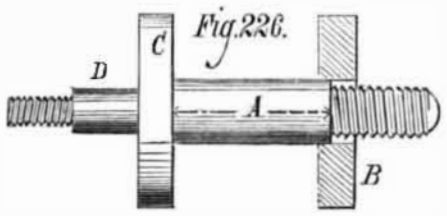
Fig. 225.



after putting a centerpiece in each hole, we draw (along the entire length of the lever and across the faces of the hubs) the center line, A, locating it in the center of the stem; we then apply the trammels, set as already directed, to mark off the centers of the holes. Setting our compasses at the intersection of the line, A, with the line marked on each of the hub faces, we strike the necessary circles on the faces of the hubs, as shown. We next mark off the breadth of the lever or arm on the face from the center line, A, and our marking is complete.

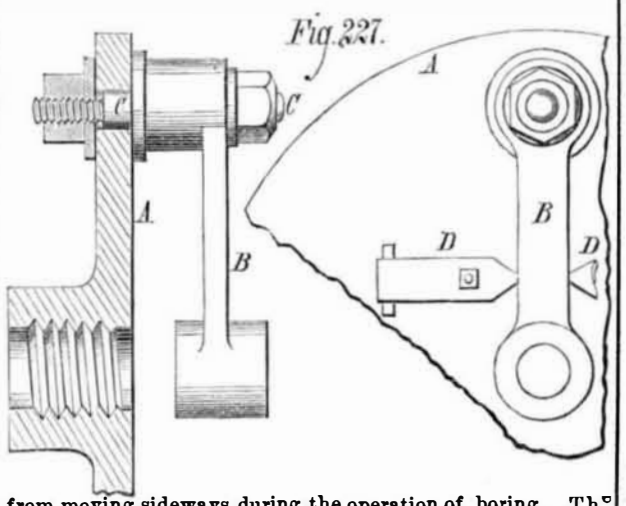
When, however, there are a number of such levers to be made, all requiring to be of nearly equal length from center to center of the holes, one only should be marked off for the hole centers, care being taken to mark it off with great exactitude. Then after that one is bored, and the faces of the hub are faced off true with the hole, a pin, as shown in Fig. 226, should be made, the diameter of the part, A being made to neatly fit one of the holes in the end of the arms or levers, and being marked shorter in length than is the length of the lever hole into which it fits. B is a washer, turned to fit easily to the diameter of A, and C is a collar, solid with A. D is a stem, turned parallel and true; and it is a little less in length than the thickness of the chuck plate upon which the

Fig. 226.



arm is to be held while the holes are being bored. Upon each end a screw is provided to receive a nut. The use of this stud is as follows: Upon the chuck plate of the lathe or boring machine, and at the requisite distance from the center, is bored a hole to receive at a close fit the plain part, D, of the stud; and into this hole that end of the stud is fastened by means of a nut. One end of the lever or arm (being bored to fit the part, A, of the stud) is placed thereon, the stud being bolted to the chuck plate while the hole at the opposite end is being bored: thus insuring that the holes are exactly the same distance apart in all the levers. The manner of chucking is shown in Fig. 227, in which A represents a portion of the chuck, B the lever or arm to be bored, C the stud, and D D the plates bolted against the chuck so tha their ends contact with the stem of the work to prevent i

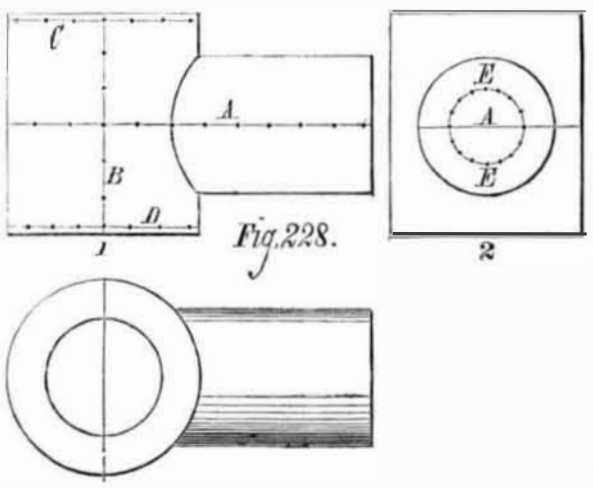
Fig. 227.



from moving sideways during the operation of boring. The use of this stud, modified in shape to suit the work, is also applied to the turning of cranks, eccentrics, and other similar work, requiring unusual exactitude in the position of a hole or holes, or of a diameter in its position relative to a hole.

To mark off a crosshead in which one hole requires to be at right angles to the other, we proceed as follows: First placing the crosshead upon the marking table, in position 1 in Fig. 228, we draw with the scribing block the center line, A, marking it all round the crosshead; and if the crosshead has a hole or holes in it, we put centerpieces in those holes to receive the center lines. We then place a square with its back resting upon the marking-off table, and draw, paralle

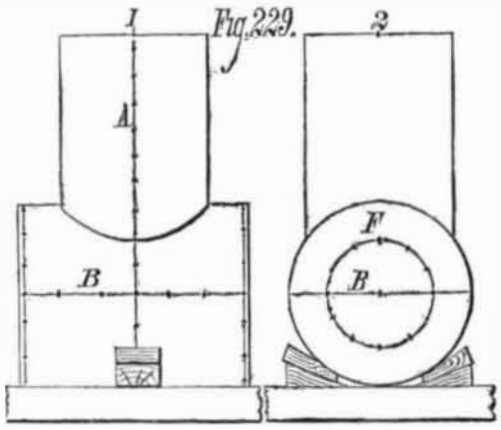
Fig. 228.



with the edge of the blade, the center line, B. From the intersection of the lines, A and B, we draw the lines, C and D, marking their distances from the line, A, with a pair of compasses, and carrying the lines round with the scribing block. We draw the circle, E, using the line, A, as a center and locating it, as nearly true as we can, the other way from the hub or stem. We now stand our crosshead in the position shown in Fig. 229; and applying a square to the line, A, we set it to a right angle with the face of the line, A, wedging it upright with the wedges shown. Then, setting the scribing block needle point even with the line, B, of position 1 in Fig. 229; and setting that line true with the surface of the table, we carry it across the other face, as shown in position 2, locating its position sideways to suit the forging or casting; and then we strike the circle, F, which completes the marking.

It will be noted that the lines, A and B, are mere guides whereby to obtain the centers of the circles from; and it may therefore be asked for what purpose those lines are center-punch-marked. The reply is that those lines must be used as guides to set the work by when chucking the crosshead on the lathe or machine. We may here also note that the length of those lines is often too short, in consequence of the shortness of the work, to form a very accurate guide for the setting. To obviate this difficulty, the machinist should first chuck the work by one of the lines, and then perform all the duty necessary at that chucking. Then, in the second

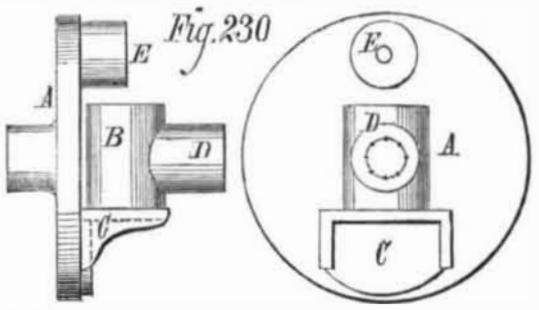
Fig. 229.



chucking, he should adopt one of the following methods to set the work true, independent of the second line:

In Fig. 230, A represents the face plate of a lathe, and C an angle plate, that is, a plate having its two flat surfaces at a right angle to each other. It is evident that if the work has the hole, parallel with the line, B, bored, and the end faces round that hole trued with it, we have only to bolt the angle plate, C, to the face plate, A, of the lathe, and then to bolt one of the turned faces of our work to the face of the angle plate, and set the latter so that the parallel stem, D, of the work runs true; and then it will be so set that the holes, if bored true with the tool, will stand at a right angle to each other. In all cases, however, in which an angle plate is used, or in which, from other causes, there

Fig. 230.



is a greater amount of weight on one than on the other side of the face plate of the lathe, there should be bolted to the latter a weight sufficient to act as a counterbalance, such a weight being shown at E, in Fig. 230; otherwise the work will be bored and turned slightly oval. The other method of chucking referred to is to bore out one hole; and having faced up the faces at the end of that hole, to then chuck the work with a parallel mandrel, fitting neatly into and projecting from the hole already turned. The work must be so set that the mandrel stands true or parallel with the face plate of the lathe; this may be done in conjunction with the use of the angle plate, thus insuring accuracy in the chucking of the work.

A Shower of Meat.

The Bath County (Ky.) *News* says: On Friday, March 3, 1876, a shower of meat fell near the house of Allen Crouch, who lives some two or three miles from the Olympian Springs in the southern portion of the county, covering a strip of ground about one hundred yards in length and fifty wide. Mrs. Crouch was out in the yard at the time, engaged in making soap, when meat which looked like beef began to fall around her. The sky was perfectly clear at the time, and she said it fell like large snow flakes, the pieces as a general thing not being much larger. One piece fell near her which was three or four inches square. Mr. Harrison Gill, whose veracity is unquestionable, and from whom we obtain the above facts, hearing of the occurrence, visited the locality the next day, and says he saw particles of meat sticking to the fences and scattered over the ground. The meat when it fell appeared to be perfectly fresh.

The correspondent of the Louisville *Commercial*, writing from Mount Sterling, corroborates the above, and says the pieces of flesh were of various sizes and shapes, some of them being two inches square. Two gentlemen, who tasted the meat, expressed the opinion that it was either mutton or venison.

Singing in Chinese.

The enlightenment of the Chinese in religious matters, more especially in singing, is a work of extreme difficulty. Mr. Walker, a missionary at Foochow, writes to the *Missionary Herald*:

"There is one very serious drawback to the use of music as a means of preaching the Gospel in China. In singing, the word tones cannot be given, and this destroys the sense. For in Chinese, as a rule, every articulate sound represents at least two or three different words, while the more common, such as 'ting,' 'ling,' and 'sing,' often represent two or three dozen different words, and without the help of the tones they have no meaning whatever. So when a hymn is sung to a Chinese audience who are not already familiar with it, it has scarcely more meaning to them than it would have to a foreigner just arrived. In fact I have sometimes just sung a foreign hymn to the audience, and then interpreted and expounded it, and it seemed to answer as well as a native hymn."