SCALE DIMENSION CALCULATOR

THIS LITTLE gadget has been designed to give instant readings for scale dimensions in inches corresponding to full size dimensions in feet and inches for a whole variety of different standard scales. You do not have to work anything out—just insert the appropriate slide in the body and read off the scale dimensions required direct.

The basic parts are made from balsa, and comprise one body plus one slide for every scale you want to work on—1/96th, 1/72nd, 1/48th, and so on. The scales are the only tricky parts, so these are reproduced full size on the plan ready for cutting out and cementing to the balsa parts.

Details of the body assembly are shown in Fig. 1. Parts required are—one piece $11\frac{1}{2}$ in. × $1\frac{3}{4}$ in. cut from hard $\frac{3}{16}$ in. sheet balsa; two pieces 11 in. × $\frac{1}{2}$ in. cut from hard $\frac{1}{8}$ in. sheet balsa; two pieces 11 in. × $\frac{5}{16}$ in. cut from hard $\frac{1}{8}$ in. sheet balsa; one piece $1\frac{3}{4}$ in. × $\frac{1}{2}$ in. × $\frac{1}{4}$ in. balsa.

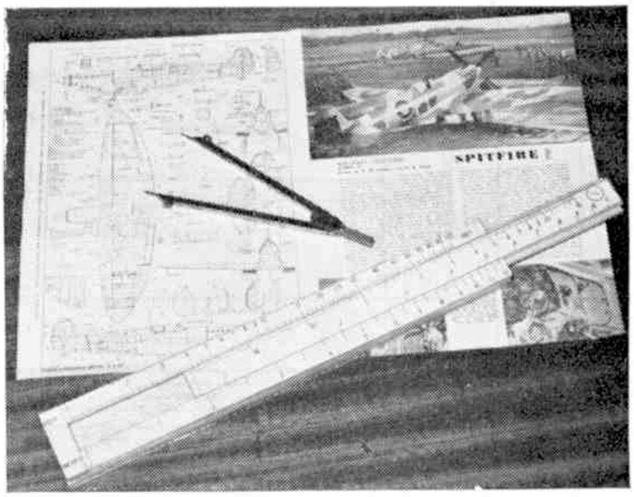
It is very important that these parts be cut accurately—i.e. the four strip peices must be exactly parallel—otherwise it will be difficult to read the scales accurately. Assemble by cementing all the parts onto the base piece, as shown in Fig. 1.

A slide is made quite simply by cementing a $11\frac{1}{2}$ in. × $\frac{3}{4}$ in. × $\frac{1}{8}$ in. strip exactly over the centre of a $11\frac{1}{2}$ in. × $1\frac{1}{8}$ in. × $\frac{1}{8}$ in. piece, as shown in Fig. 2.

Cut out the paper scales for the body and the slides from the full size plan. The body scale is cut in one [-shaped piece and cemented in place. If you find it easier to cut the two body scales separately, make sure that they line up in exactly the same position as drawn on the plan.

Each slide scale is cut out separately and cemented to its balsa slide, positioned exactly level with the balsa edge at the left hand end. Now check that when a slide is inserted in the body and pushed right home the vertical line on the slide scale lines up *exactly* with the 'I' on the top and bottom body scales.

The calculator is used as follows. The top scale on the body refers to full size dimensions in feet.



With the appropriate slide in position, the equivalent of any dimensions (i.e. its corresponding position on the top body scale) can be read as a scale dimension *in inches* immediately underneath the full size dimension. The range of full size dimensions covered is from 1 foot to 100 feet, so this should cover most requirements. For dimensions larger than 100 feet, either work to 1/10th the size and multiply the answer by ten; or find the scale dimension in stages for 100 feet + the remaining dimension.

The lower body scale is for full size dimensions in *inches*. Again the scale dimension is read off on the *slide* scale which comes adjacent (i.e. the bottom slide scale), against the actual full size inches. This time the scale dimension is given in *thousandths* of an inch.

Remember, be sure to insert the appropriate slide for obtaining scale dimensions in the scale you want. The six scales given cover most common scales, but for others not included the following notes apply.

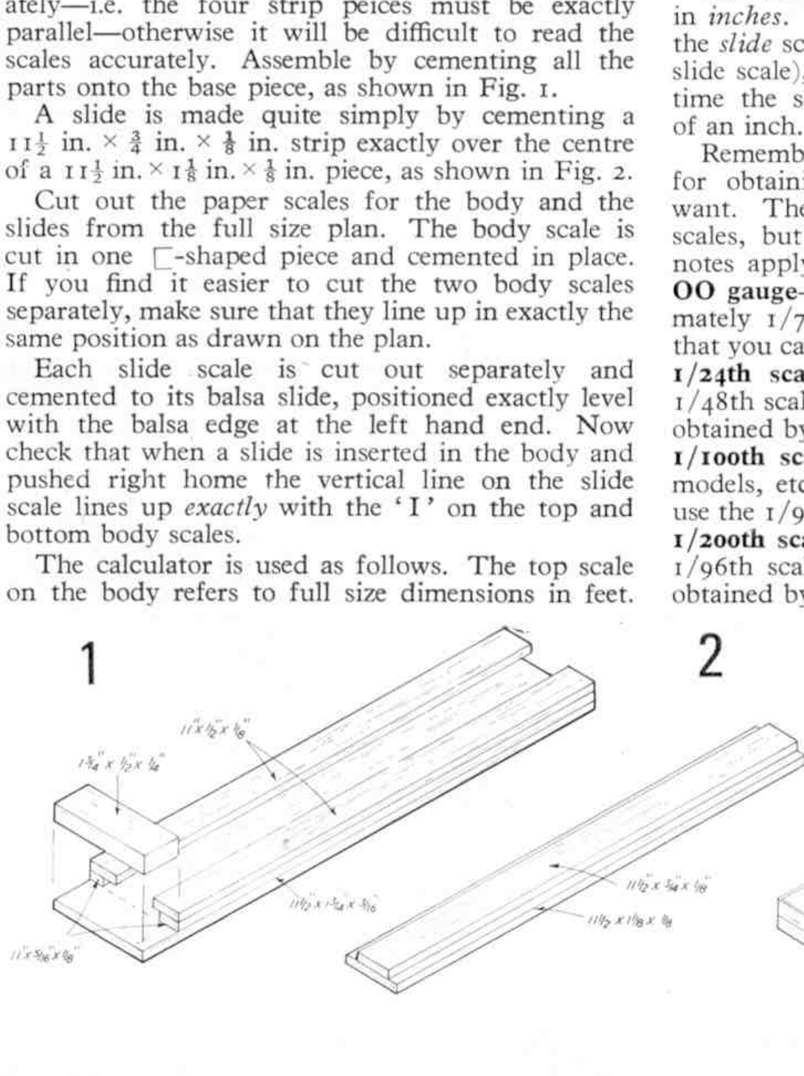
OO gauge—which is 4 mm to the foot or approximately 1/76th scale. This is so near 1/72nd scale that you can use the 1/72nd scale slide.

1/24th scale—a popular slot car scale. Use the 1/48th scale slide and multiply the scale dimensions obtained by 2.

1/100th scale—sometimes used for waterline ship models, etc. This is so near 1/96th that you can use the 1/96th scale slide.

1/200th scale—also used for ship models. Use the 1/96th scale slide and divide the scale dimensions obtained by 2.

1



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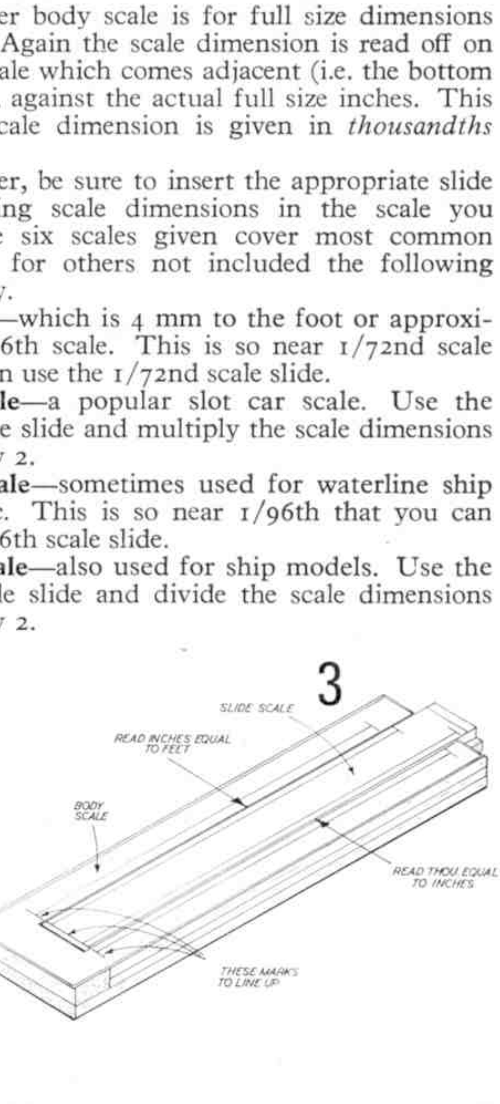
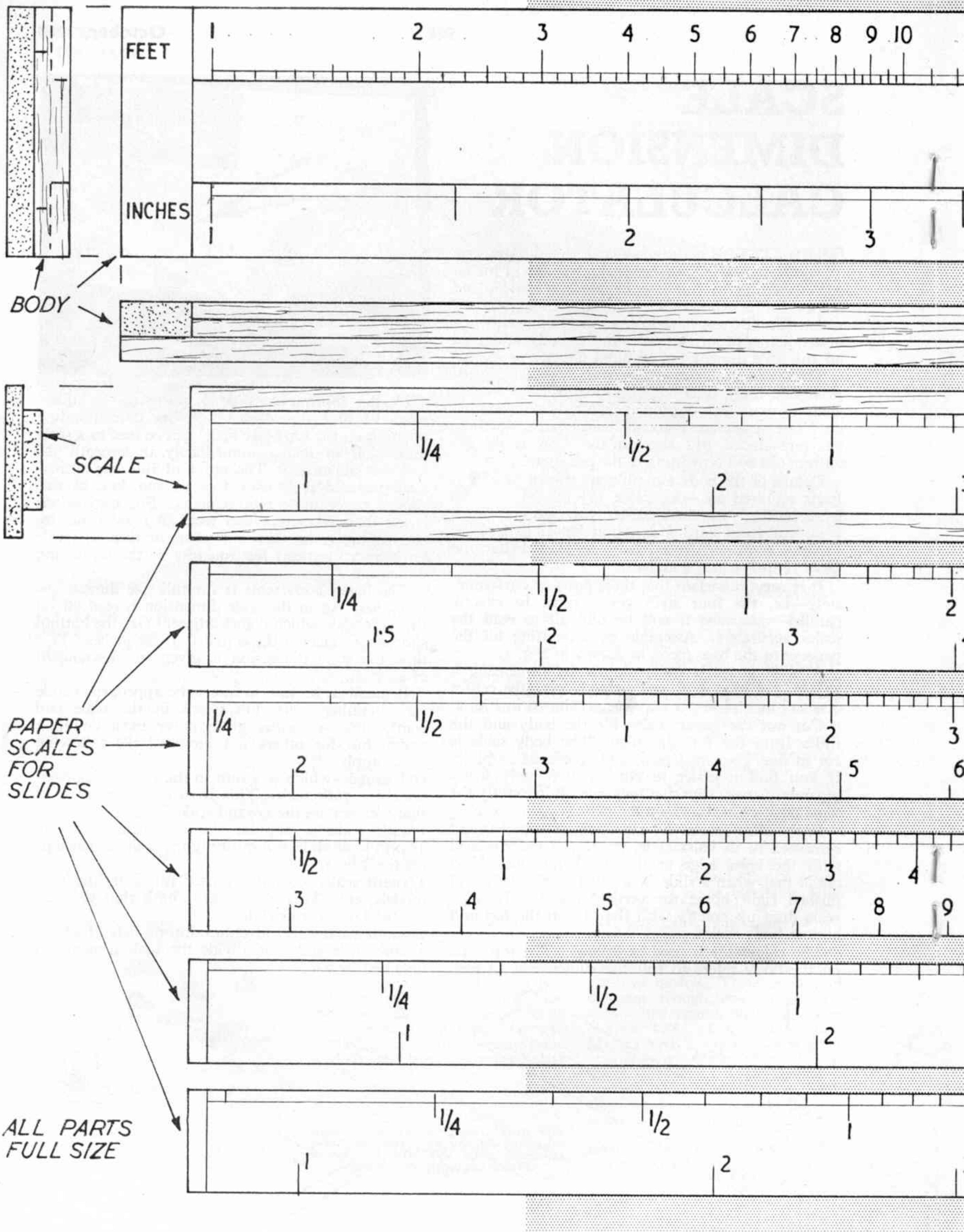
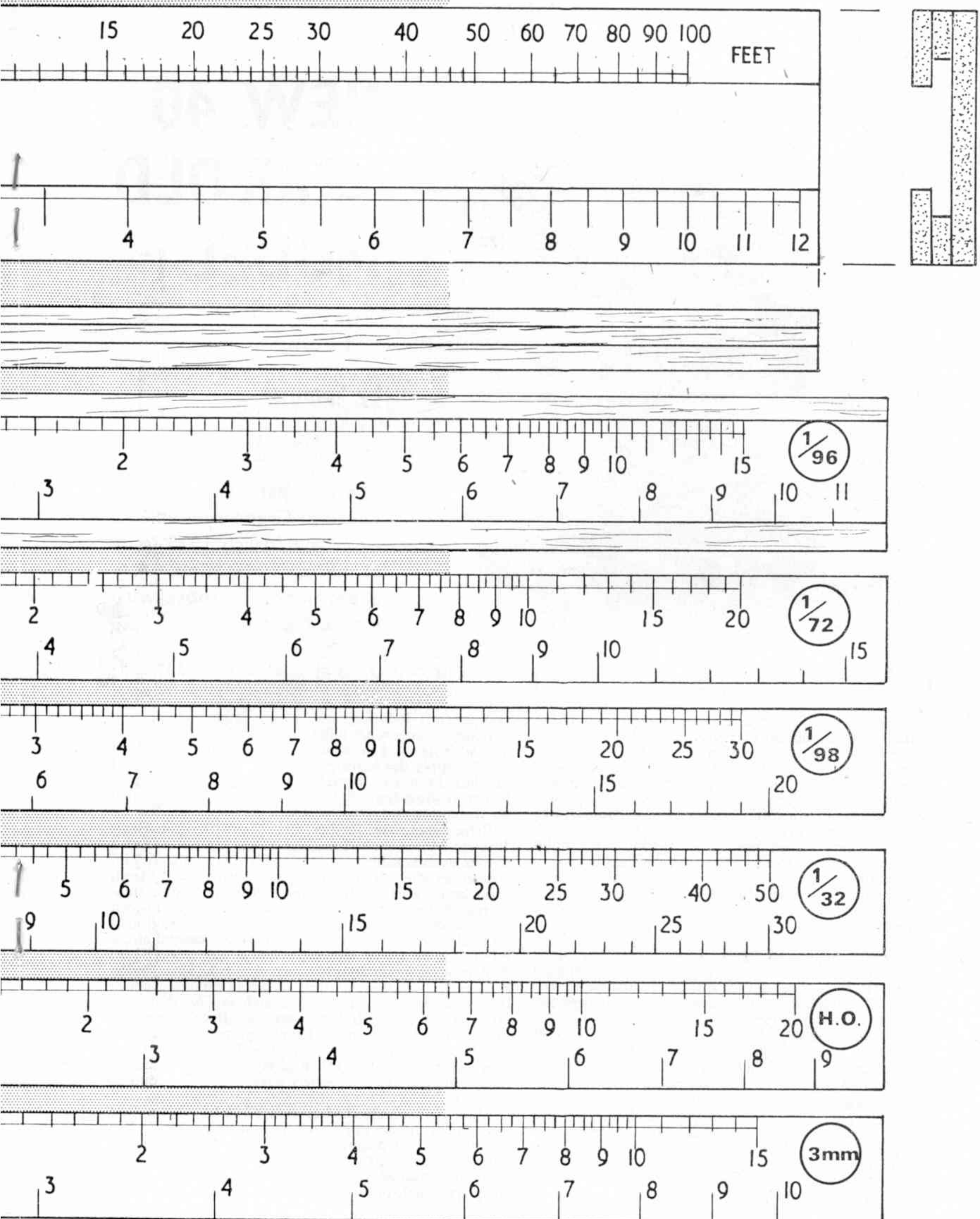



FEET
INCHES
BODY
SCALE
PAPER SCALES FOR SLIDES
ALL PARTS FULL SIZE



FEET
1/96
1/72
1/98
1/32
H.O.
3mm

Item No. 1 is a Multiple Drive Mechanism reminiscent of a type which, according to the original manual, " . . . is frequently employed in multiple drilling machines and similar apparatus where several shafts are required to rotate at a uniform speed and in the same direction." The unit is really very simple, consisting of little more than five Rods journalled in two Face Plates and carrying various Pinions or Gears. The input shaft 1, free in the bosses of the Face Plates, has a 1½ in. Contrate Wheel 2 and a 57-teeth Gear 3 fixed to it. This Gear is in constant mesh with four ½ in. Pinions fixed one on each of four countershafts, held by Collars in the outside circular holes of the Face Plates, while Couplings 4, mounted on the lower ends of the countershafts, are used to carry the drilling bits. The Face Plates are of course secured to the body of the machine in which the mechanism is fitted, the drive being transferred via a Pinion to Contrate Wheel 2.

In operation, the length of the Rods and the method of mounting the Face Plates depends entirely on the "parent" model, but, for demonstration purposes, I have used one 5 in. and four 5½ in. Rods, and have mounted the Face Plates in a framework of Angle Girders. The following Parts List applies to the unit as illustrated.

PARTS REQUIRED

2—6a	4—26	8—38
4—9	1—27a	4—59
2—9a	1—28	4—63
2—14a	20—37a	2—109
1—15	20—37b	

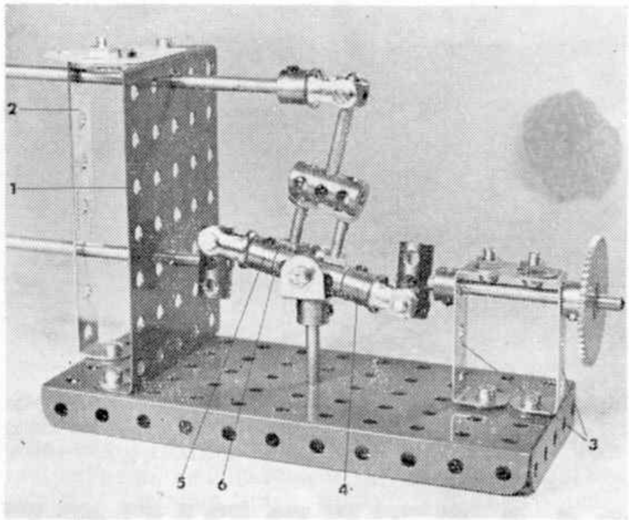
Swashplate

Item No. 2 from the Standard Mechanisms Manual is a Swashplate Unit. This is a mechanism which acts as a sort of cam to give a reciprocating (back-and-forth) motion to a rod, but it is unlike the normal cam in that the motion is in a direction parallel to the revolving input shaft of the mechanism. As you know, the reciprocating movement resulting from a normal cam is at right-angles to the input shaft.

The mounting shown in the original Manual and reproduced here consists of a 5½ × 2½ in. Flanged Plate to which are bolted a 3½ × 2½ in. Flanged Plate 1, a 3½ × ½ in. Double Angle Strip 2 and two 1½ × ½ in. Double Angle Strips 3, the last spaced from the larger Flanged Plate by one Washer in each case. The tops of Flanged Plate 1 and Double Angle Strip 2 are joined by a Flat Trunnion, while a Fishplate connects the upper lugs of Double Angle Strips 3.

Held by a 50-teeth Gear and a Collar in Double Angle Strips 3 is a 2½ in. Rod, serving as the input shaft. On the inner end of this a Coupling is fixed, the Rod passing through its centre transverse bore, while a Small Fork Piece 4 is pivotally attached to one end of the Coupling by a lock-nutted ¾ in. Bolt. Another similar Coupling/Small Fork Piece arrangement 5 is mounted on the end of a 4 in. Rod journalled in Flanged Plate 1 and Double Angle Strip 2, then the two Small Fork Pieces are joined by a 1½ in. Rod on which a Coupling 6 is *loosely* mounted. A Large Fork Piece 7 is attached to the centre of this Coupling, the securing Bolts being prevented from fouling the 1½ in. Rod by a Nut on the shank of each.

(Text continued on page 550)



Also rebuilt from the pre-war Standard Mechanisms Manual, this Swasplate Unit serves as a type of cam to convert rotary motion into reciprocating motion which acts in a line parallel to the input shaft.

A close-up view of the Couplings and Fork Pieces, etc., making up the conversion section of the Swashplate Unit.