[The Editor of Handy Man's Workshop will be glad to receive any suggestions for this department and will pay for them, promptly, if available.]

Drilling an Awkward Piece

By G. H. Ander

THE following may be worth while to many, as it was to those it concerned, when it happened.

I was working in a railroad repair shop one day when I observed two machinists working a ratchet drill in order to make holes in a piece of iron about 12 feet long, with one end bent up about 8 inches. The holes were being made in the short part (see illustration). The shape of the iron to be bored or

Drilling an awkward piece in a milling machine.

drilled prevented it from being done in a drill-press or lathe.

The men had the iron and ratchet drill with its holder clamped to an iron table and were working hard for a considerably long time to make the holes.

I asked the foreman if there were many jobs like that in the place. "Yes," he said, "we have had to make quite a number of them in the last three years, and we will have many more." Then I said: "I suggest that you drill those holes by using that milling machine" (pointing to one which was used very seldom). "Well, well," he exclaimed, "I never thought of that before, and neither did the machinists who were told to perform the job." After that the holes were always drilled in the milling machine by one man and naturally in very much shorter time than it used to require two men with the ratchet drill.

How to Make a Ratchet-drill

THE ratchet drill here illustrated will be found extremely handy around the house for quick repairs. Take an old milling machine cutter that has seen its best days and anneal it. This will make as good a ratchet wheel as you want.

A ratchet wheel, A, should be keyed on the drill carrier or spindle B. Then bend a piece of strap iron

A home-made ratchet drill.

to a U-shape as shown at C, and drill a hole in the end of the U-shape iron, so it will be a neat sliding fit over the spindle B. A hole must also be drilled in the outer end of strap iron, so that a piece of round iron or pipe can be screwed in position so as to act as a handle, shown at D. A dog, E, is pivoted upon a pin, F, and a spring, G, holds the dog against the

ratchet wheel, A. While drilling a hole the drill is fed into the work by means of a feed screw, H, which is provided with four pins as shown in the head of the screw, thus making it easy to feed the drill into the work. The feed screw, H, has a female center which fits over the center of spindle, B. The ratchet held in this way will be held very rigid. The spindle is made so it will take any size of drill having a No. 1 shank.

Drafting Room Kinks

By John D. Adams

ON drawings where the lettering is considerably scattered and some degree of uniformity is desired, it is quite essential that some rapid means be provided for drawing the pairs of parallel guide lines. Measuring is altogether too slow. In most drafting rooms will be found one of those rather large, obsolete, right-line pens. Cut off the points, as shown in Fig. 1, insert two chisel-pointed leads, and tighten the screw. When adjusting the distance between the leads it is only necessary to partially loosen the screw, after which the leads may be pushed in or out. This instrument is very rapid, and requires infrequent sharpening.

Fig. 2 illustrates another method of accomplishing the same end. A piece of transparent celluloid is provided with a series of slots of different widths. Although this little device is common, it is not to be found in any of the catalogues. It is superior to Fig. 1 where the lettering must not only be uniform, but of certain standard heights.

The writer has used several excellent forms of

Drafting room kinks.

lighting fixtures for the drafting table, but none that gave more satisfaction than the little light shown in Fig. 3, which was improvised in the course of a half-hour from a piece of heavy copper wire and a paper weight. On one end of the copper wire a hook is formed. The wire then curves downward toward the base, where it is bent into a rectangle the size of the paper weight. The extra length of wire is then carried upward and neatly bound to the vertical section. Two pieces of cord serve to connect the wire securely to the paper weight, and also to keep the base from scratching the table top. The electric cord in leaving the socket is fastened to the hook, from which it may be run directly to the outlet, or else down the curved copper standard and once around the knob on the paper weight. The latter is the better method. A shade of Bristol board answers every purpose, and the resulting lightness of this feature, as well as the upper works in general, renders the lamp very stable and easy to shift.

For those who have too little office space to accommodate the usual horizontal blueprint tank and yet find it necessary to make a few prints occasionally, the vertical tank shown in Fig. 4 will be convenient. This need be only an inch or two in thickness, so that the space it occupies is negligible. One or more wires running longitudinally across the top will serve to hold the prints while washing. The writer has seen a print two by three feet washed in one of the stock metal tubes used for keeping blueprint paper. These tubes are about two and a half inches in diameter and have screw tops.

In Fig. 5 is a suggestion to draftsmen who have

to use special curves very frequently. A piece of transparent celluloid, which may be obtained at most stationers, is placed over the pencil outline of the desired curve, which is then marked off. The curve is then cut out with the shears and smoothed up with file or sandpaper. A piece of cardboard will serve to keep the celluloid far enough away from the paper to permit the use of the ruling pen.

There are comparatively few draftsmen who fully appreciate the possibilities of the ordinary flat machinist scale. With a little practice this form of scale may be readily handled on edge in which position spacing may be done with almost mathematical accuracy, as a sharp pencil point fits into the small grooves that mark the distances on the scale. In fact, there is probably no other method by which a point can be placed accurately and quickly.

Supposing that in Fig. 6 it is desired to subdivide the space between the two parallel lines into thirteen equal parts: Simply place the scale at a suitable angle to the parallel lines so that thirteen equal divisions—in this case quarters—exactly reach from one line to the other. Run the pencil point down each quarter mark, and the spacing is done.

Floating Reamer for Lathe

By H. D. Chapman

THE accompanying engraving shows how a floating reamer can be made and the way it is used.

For very accurate work the floating reamer has come to be the standard. This style of reamer the writer has used very successfully on a lathe.

Floating reamer for lathe.

The reamer is held in a holder as shown, the holder is bored about $\frac{1}{8}$ -inch larger than the body of reamer. This is done so as to allow the reamer free movement. The reamer is held as shown against a center at the back and it has a pin through it at B, which prevents the reamer from turning. The hole that is drilled through the holder should provide about $\frac{1}{8}$ -inch clearance, so that the reamer can find its center while in use. There are four springs shown at C which are used to adjust the reamer into alignment with the work. These springs are held in position by means of set screws A. This reamer has now been in service for about two years and is used for reaming draw tubes for telescopes.

A Novel Method for Attaching Veneer

By R. C. D.

SOME time ago the writer had occasion to veneer a large box with mahogany. Not having the necessary facilities for glueing the veneer and clamping it in place until it was thoroughly set, as is the usual method, he proceeded to attach it as shown in the accompanying illustration. It is a simple method, and one which gave excellent results.

The mahogany was about $\frac{3}{16}$ inch thick, and it was to be inlaid with $\frac{1}{16}$ inch white holly. The recesses for the inlay were first cut out. The mahog-

Method of attaching veneer.

any was then placed in position on the box which was of white pine, and was firmly attached to it by means of screws which were placed at various intervals in the recesses. The heads of the screws were countersunk into the bottom of the recesses as shown. The white holly was then laid in the recesses and secured in place with glue and thus all traces of how the veneer was held in place were completely hidden.

This is a trick worth knowing and it may come in handy for a number of our craftsmen friends who have like work to do.