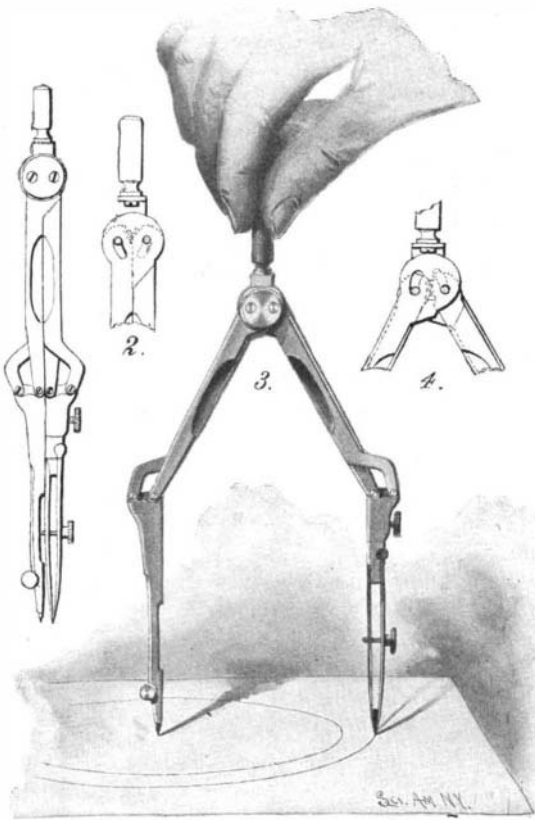


**IMPROVED DRAWING COMPASSES.**

In order to draw a perfectly smooth ink line it is necessary to hold the drawing pen at such an angle that both blades will at all times bear evenly on the paper. While this is a very easy thing to do with the ordinary drawing pen it is quite a different matter when a pen compass is used. In adjusting the pivot leg and drawing leg to a certain desired radius the draftsman has to operate not only the main joint at the handle, but also the knee joints in each leg, so that the needle and pen sections lie parallel with each other. This is a matter of considerable difficulty for the novice and is often a source of annoyance to even the experienced draftsman. A very useful invention,



**IMPROVED DRAWING COMPASSES.**

therefore, is the one herewith illustrated, for which patents have recently been granted to Mr. C. Brandell, Austin Station, Chicago, Ill.

From the detail views 2 and 4 it will be observed that the main legs of this compass turn on separate pivots, spaced apart, also that the heels or pivotal ends of these legs are provided with gear sections which respectively mesh with each other, so that the legs move simultaneously to open or closed position. Outside of these main legs are the auxiliary legs, also mounted on the two pivots mentioned. It will be observed, however, that the right auxiliary leg turns on the left pivot, while the left auxiliary leg turns on the right one. At their lower ends the two left legs are pivotally connected with the needle-point section and the two right legs with the socket for the pen or pencil. By reference to Figs. 1 and 3 it will be seen that these pivots at the lower ends of the legs are equally spaced and lie in the same horizontal plane as the main pivots at the top, so that when the legs are spread apart the needle-point and the pen or pencil, acting on the principle of the parallel ruler, always lie parallel with each other. If desired, a lengthening bar of special design may be used. The shank at one end of

this bar should lie parallel with the socket for the pen at the other end, but at right angles with the main bar. The extension bar may be made hollow to receive an extension from the socket-piece, so that the parts may be thereby adjusted to a greater radius. Since the tubular lengthening bar stands at right angles to the shank, and the pen or pencil at right angles to the bar, it follows that when the compass is opened or closed, the pen or pencil will stand at right angles to the needle point, the same as if the lengthening bar had not been used.

**TOOL FOR WITHDRAWING CASINGS FROM WELLS**

A tool has recently been invented by Mr. S. Bennison, of Galveston, Tex., which is adapted for releasing and withdrawing the metal casing of an Artesian water-well or an oil well either entire or in sections when this is desired.

Two forms of the device are here illustrated; that shown in Figs. 1 and 2 is a lifting implement and will operate very effectively to engage and grip the casing section which is to be bodily withdrawn. It will be observed that the tool comprises two chuck-jaws of semi-cylindrical form having a series of upwardly inclined teeth cut on their peripheries. The jaws when assembled form a cylinder, through the axis of which a tapering channel is formed to receive a wedge block of rectangular cross section. Preferably, the side faces of the wedge block are longitudinally fluted so as to reduce the frictional contact with the jaws and permit the introduction of a suitable lubricant. The lower ends of the chuck jaws and wedge blocks are tapered, so as to serve as a reamer for removing any dust or dirt that may have accumulated in the casing. The wedge block is formed on the end of a hollow stem of sufficient length to reach the upper end of the well casing. The jaws are yieldingly held together by spring bands which surround them at the top and the bottom, and in order to prevent the parts from getting lost down the well the jaws are secured to the stem of the wedge block by chains.

Fig. 1 shows the position of the parts when lowering the device into the well; when in proper position within the casing the stem is pulled upward and the wedge block acts to spread the clutch jaws, sinking their teeth into the inner surface of the casing section, as shown in Fig. 2. Thus a firm grip is secured and the section may be drawn up upon the application of sufficient power. To loosen the casing in the bore when the well is dry, water may be freely introduced through the bore of the hollow stem.

In some instances, the sections must be removed one after the other, as it may be impossible to draw the casing intact from the bore of the well. It will then be necessary to rotate the casing section, in order to unscrew it from the next section below. On such occasions the tool shown in Fig. 3 will be found useful. The construction in this case differs from that just described only in the arrangement of the teeth, which in this case, are formed longitudinally on the clutch jaws. The cap secured to the upper end of stem is adapted to receive a lever which, after the jaws have been spread, may be operated to unscrew the casing section from the next lower section.

**OIL BURNER.**

The present scarcity of coal has brought into prominence many heating devices designed to burn a substitute fuel. The oil burner which is illustrated herewith deserves special notice from the fact that it is designed to be used in connection with the ordinary kitchen range; the device, however, is not attached to the stove, but may be immediately removed when desired. The burner is adapted to burn crude petroleum and produce a very strong, hot flame. Due to its simplicity, the construction will be understood at a glance. The stove is provided with a stove-lid having a central opening to admit a down-draft tube. Below this tube is placed the burner proper, which is made in the form of a cup with a conical bottom. At the apex of this cone is a depression into which oil is dropped, as shown, from a suitable reservoir.

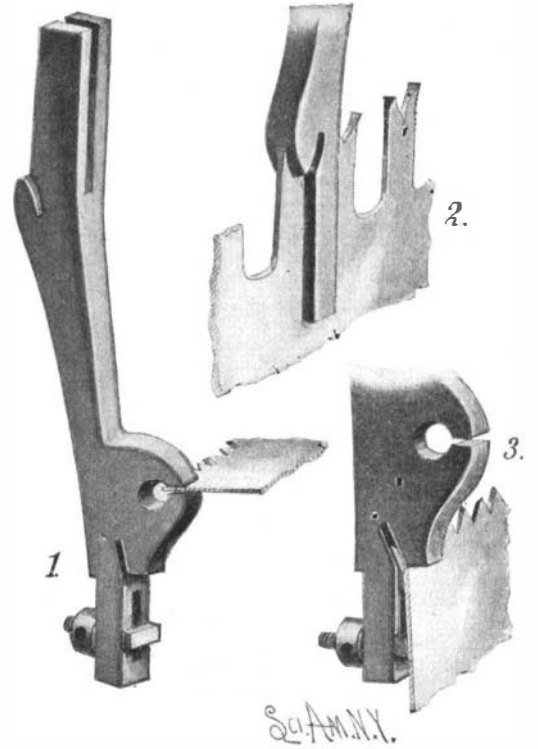
In operation, the oil will drop or run from the supply-pipe through the down-draft tube with such force that when it strikes the apex of the cone it is atomized in the burner. Here it will be ignited, sending up a very strong flame, for all of the other drafts or openings are closed and all air for supporting combustion will be necessarily

drawn downward through the down-draft tube, while the products of combustion will pass up through the stove-pipe. The inventor of this oil burner is Mr. E. Stewart, of 601 Milton Avenue, San Diego, Cal.

**SAW-TOOTH TOOL.**

The invention which is herewith illustrated provides a very convenient tool for operating on the teeth of cross-cut saws; it affords a means for setting the teeth and a means for straightening the teeth, and a device for spreading or swaging the drag-teeth, all of which features are embodied in a single tool.

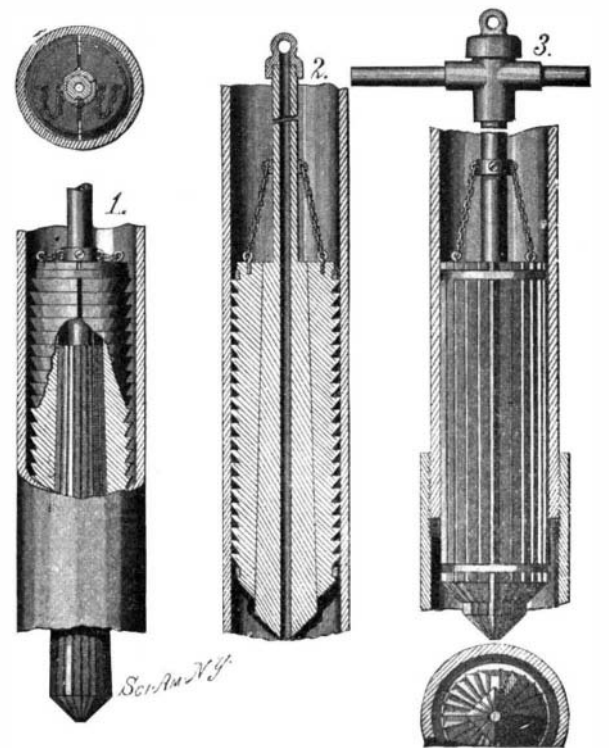
The device, as shown in Fig. 1, comprises a body portion having near its lower end a lateral projection provided with a slot to receive a saw-tooth for the purpose of straightening the same. At the base of this



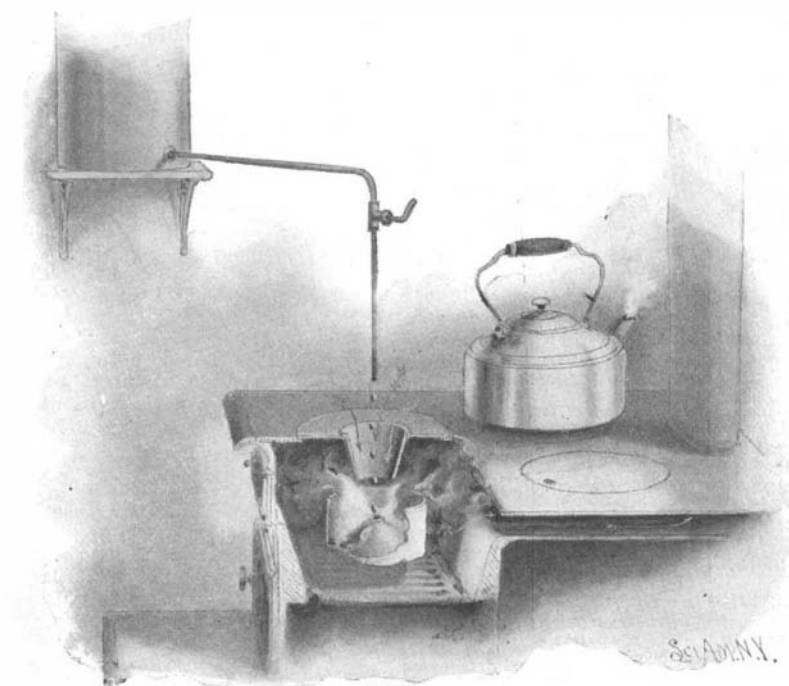
**A SIMPLE SAW-TOOTH TOOL.**

projection is another slot used in setting the saw, as in Fig. 3. A clamping-bolt passes through a longitudinally disposed slot in an extension at the lower end of the tool, and is provided with a gage block adapted to bear against the face of the saw blade. After adjusting this block to the required position against the blade and inserting the tooth in the slot above, a sharp tap with a hammer on the upper end of the tool will cause the proper bending or setting of the tooth.

The upper end of the tool is provided with spaced members adapted to straddle the saw, as in Fig. 2, when it is desired to swage the drag-teeth. At the base of these members is a forming-tooth adapted to be inserted between the double points of the saw-teeth; now, by a sharp blow of a hammer the forming-tooth may be pressed down between these points to properly spread or swage the saw-teeth. From the foregoing description it will be seen that the tool fills all requirements in the proper setting of cross-cut saws. A patent for this invention has recently been granted to Mr. Torbjorn Olsen, 242 Meacham Street, Manistee, Mich.



**TOOL FOR WITHDRAWING CASINGS FROM WELLS.**



**OIL BURNER FOR USE IN KITCHEN RANGE.**