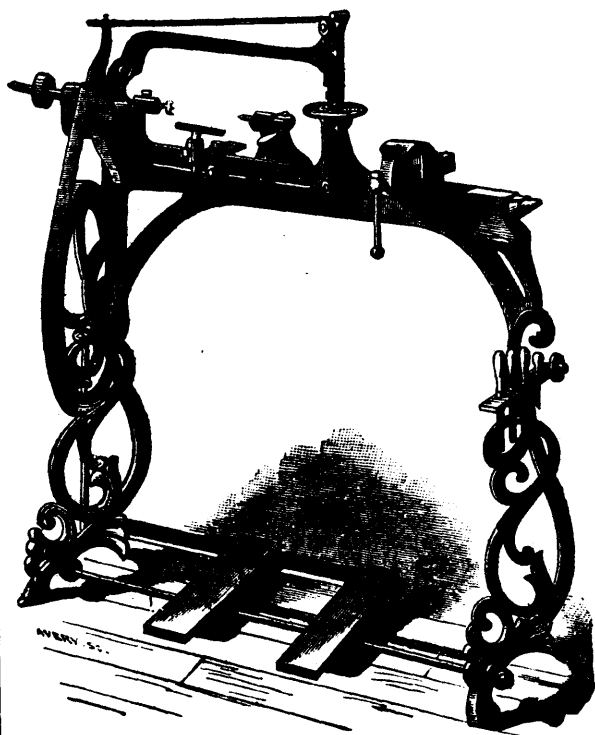


**COMBINATION LATHE, SCROLL SAW, ETC.**

The machine illustrated herewith is a combined foot power drill and turning lathe, scroll saw, grinding wheel, vise,



and anvil, in the construction of which many novel features are embodied. The body and legs are cast iron, the treadles wood, the belts leather, the wrench iron, the fixed screws polished iron, the set screws casehardened, the finish black japan with ornamental paintings. The lathe will turn work four inches by nine long. It is suitable to hand turning, has a press lever for drilling, and is furnished with steel spur and pointed centers. The rest has all the adjustments common to large turning lathes. The scroll saw plays vertically through the center of an iron table, which may be tipped on an angle for inlaid work. The saw is held by means of iron clamps and thumbscrews, said clamps being attached, each to the end of a leather band, which bands pass over friction pulleys and are hung to pins on the ends of the vibrating lever, which is driven by an eccentric on the lathe spindle. There are several pin holes in the upper band to adjust the strain to saws of varying lengths. An arm projecting over the table serves as a presser foot to hold the work down while sawing, and adjusts itself to varying thickness in boards. When the saw is disconnected to enter holes, said arm may be raised to admit the board, or it may be swung over to leave all clear above the lathe if desired. This machine swings fifteen inches under the arm, and the motion of the saw is in a straight line.

In carrying out this principle of operating the jig saw on a large machine, the saw is hung in sliding guides as usual, but the bands for reaching any distance on the work and the vibrating lever are the same as here shown.

It is claimed that no perceptible jar is felt in running a sixteen inch saw that will reach the center of work up to ten feet radius. This steadiness is caused by the vibrating lever being very short and well balanced, and by the cushioning effect of the inertia of the bands.

The lever need not be over six inches radius to give the saw four inches stroke.

The vise and anvil are permanent attachments to the machine. The emery wheel on the spindle is heavy, and serves as a fly wheel to the lathe and saw. In the outer end of the spindle is a drill for bracket work. When desired, the manufacturer furnishes tools and extra parts with the machine, such as face plates for chucking, a drill plate, a circular saw, and table, turning gouges, chisels, etc.

Patent pending. For further particulars see Business and Personal column, or address W. X. Stevens, East Brookfield, Mass.

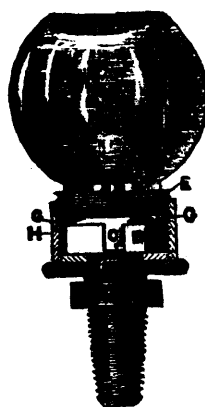
**The Delicacy of the Telephone Circuit.**

In a recent lecture before the Society of Telegraph Engineers in England, Professor Bell called attention to the remarkably slight earth connection which is needed to establish a circuit for the telephone. In describing an experiment showing this, he stated that while an assistant made connection at his end of the line by standing on a grass plot, he himself stood upon a wooden board. On trying the telephone Professor Bell was very much surprised to hear a continuous musical note uttered by his coadjutor, and on looking for the cause he found that a single blade of grass was bent over the edge of the board and that his feet touched it. The removal of the grass was followed by a cessation of sound from the telephone, but the sound became again audible whenever the Professor touched even the petal of a daisy with his foot.

**AUTOMATIC SHAFT OILER.**

The annexed cut represents a new and simple shaft oiler, by means of which it is claimed that the difficulty experienced in making an air-tight joint between the glass globe and its brass socket, and in regulating the flow of oil, is avoided.

A is a glass globe with grooved neck, B, the end of which is ground smooth to form a tight joint against a cork washer.



A threaded brass ring with a projection, C, to prevent turning, slips over the neck, and is retained by a soft brass ring to the groove above B. The feed is regulated by a hole in slotted screw, D, with air-tight packing, E. The slot in screw is parallel with the hole, and will show the amount of fuel like a cock. A new glass is easily replaced by removing the soft brass ring from the groove, and the feed regulated without removing the cup.

By the use of these cups, waste in oiling machinery is claimed to be avoided, as it is stated that a cupful of oil will keep machinery

well lubricated for many months.

For further particulars address F. Lunkenheimer, Cincinnati Brass Works, Cincinnati, Ohio, sole owner and manufacturer.

**HARDENING STEEL.**—The risk of cracking steel when hardening is much reduced by surrounding the article, when in the fire, by shreds of leather, bone, &c., or by covering it with the prussiate of potash as soon as it gets to a dull red heat; then it may be heated to the proper temperature for hardening. If the piece to be hardened is of moderate size I should heat it as above, with leather, &c., and at a good red heat immerse it vertically in a mixture of oil, tallow, &c., the proportions of which were given some two months ago.