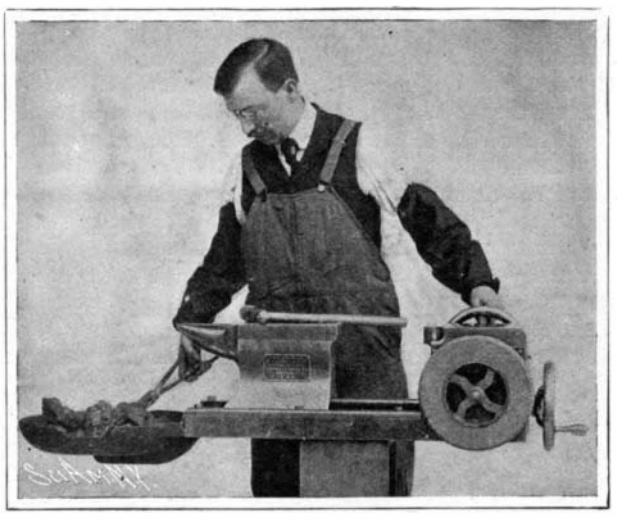
A USEFUL COMBINATION TOOL.

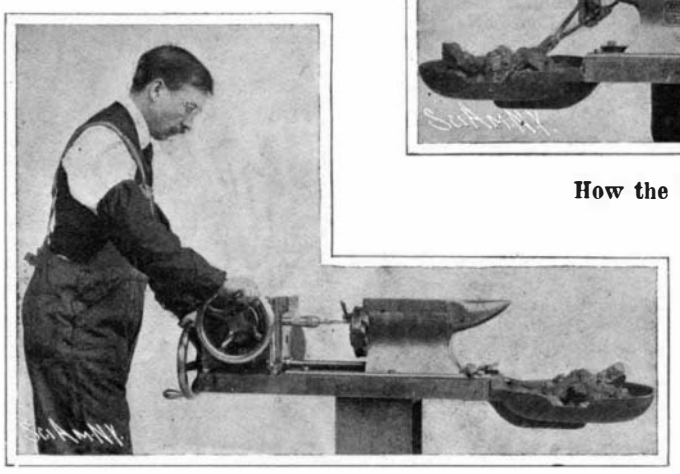
BY A. FREDERICK COLLINS.

The farmer, the automobilist, and the householder frequently have occasion to make repairs, sharpen plow points, cultivator shovels, and the like. Often the parts to be repaired must be sent to the machinist or the blacksmith for lack of proper tools. Much time and money could be saved by using some combination machine tool, uniting in itself the various implements required from time to time. It is this purpose which the tool herewith illustrated is intended to meet. This tool contains in a single unit a workshop complete in every detail, and at a cost hardly exceeding that of an ordinary hand forge. This tool combines on a single base, or bed-piece, a pipe vise, an anvil, a forge, bench vise, drill press, and emery wheel. It is made in two sizes, the smallest and lightest weighing 135 pounds, and the largest and heaviest 200 pounds, the latter having a length of 50 inches over all, a width of 10 inches, and a height of 12 inches.

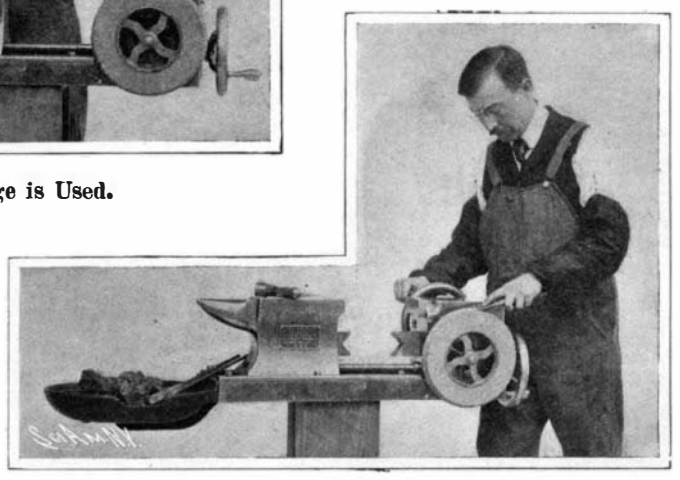
The tool, for the purpose of explaining its construction, may be divided into three general parts, namely, the headstock, the anvil, and the forge. The forge has a fire-pot 14½ inches in width and 16 inches long, the air being supplied by a rotary blower located in the headstock. The air is delivered to the center of the forge through a channel in the base-plate. The fan shaft of the blower projects through the air intake at the front side of the gear case, and is fitted to receive an emery wheel, the intake being so placed that the draft of air draws the emery dust into the forge and away from the operator. The fire is started in the forge exactly as it is in an ordinary stove.



How the Forge is Used.



Drilling a Piece of Work.



The Emery Wheel in Operation.

The blower and emery wheel are operated by a crank wheel located on the rear side of the gear case. The rotary jaw and emery wheel are geared in the ratio of 12 to 1, so that they can be revolved by hand at a speed of 2,000 revolutions per minute. The emery wheel is 10 inches in diameter. An emery wheel, as everyone knows that handles tools, is a vital necessity in a shop, since all edged tools can be sharpened not only better but in far less time than on an old-time grindstone.

The drill press is fitted with a Barber adjustable chuck taking drills to ½ inch; it is geared 2 to 1, giving great power and speed. The socket for receiving the chuck is driven by gears incased in the headstock; the gears are supplied with a clutch mechanism, enabling them to be thrown in and out of mesh at the will of the operator. The work to be drilled is placed across the face of the tailstock, and forced up as the drill is cutting by means of the vise screw.

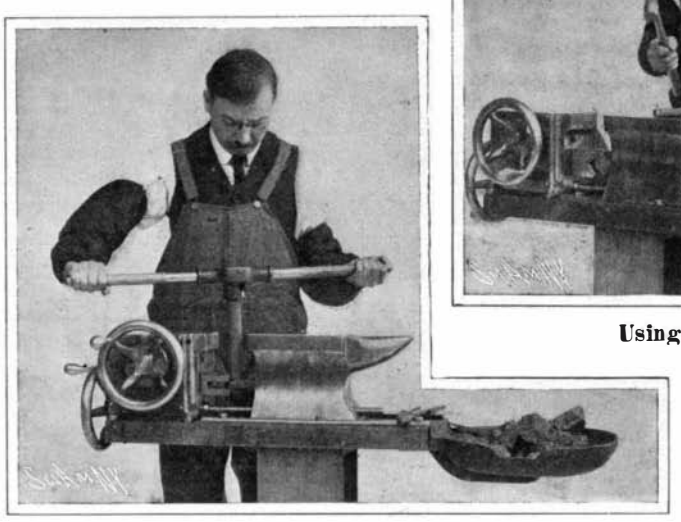
When work is to be drilled, the operator takes his position at the headstock of the tool, and grasping the crank handle with his right hand, he feeds the drill with his left. The power obtainable with the feed wheel is so easily underestimated, that unless care is exercised the result will be a broken drill bit. When using the drill all the bearings should be freely oiled, and when drilling steel the cutting point of the drill should also be plentifully oiled; a hardwood drill block that fits nicely to the end of the anvil should be used when drilling.

The blower, emery wheel, and drill press are operated by a combination crankwheel or driving pulley, so that it can be turned by hand, driven by a motor or from the driving shaft of an automobile. The transmission gears are cut and therefore accurately made, and the large wheels run into phosphor-bronze pinions, making them strong, long-lived, and practically noiseless. The gears are covered, and have a clutch arrangement at the end of the gear case, by which they can be thrown in or out of gear as desired. The anvil is 15 inches over all, 4 inches wide, and 8 inches high.

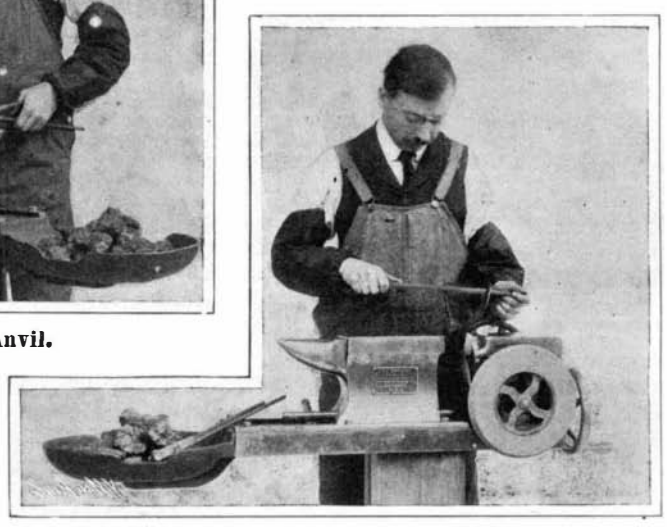
The weakest point in an ordinary vise is the front jaw; in the combination tool the bench vise is without this inherent weakness by virtue of its peculiar construction. As a reference to the cuts will show, the tailstock, which is in this case also the anvil, forms the movable jaw of the vise, which slides on the base between two adjustable guides; the last named are beveled to conform with the bevel on the base of the tailstock. This prevents lost motion, and at the same time prevents strains on the vise jaws and screws. The headstock acts as the stationary jaw. The jaws, which are made of tempered steel, are 4 inches wide and open 10 inches; these are operated by a ⅛-inch square-threaded cold-rolled steel screw fitted with a crank wheel which has a drop-forged steel handle, and holds just as securely when opened to its greatest distance as when closed.

The pipe vise has jaws made of tempered tool steel,

Using the Anvil.



The Tool as a Pipe Vise.



The Anvil and the Head Stock Form a Vise.

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and is operated by the same heavy screw as the bench vise; it will securely hold any pipe from ⅛ inch up to 3 inches in diameter, and the jaws can be changed so that the pipe may be held horizontally or vertically as desired, thus enabling the operator to do a wide range of work.

There is also included in the outfit an anvil hardy, that is a square-shanked chisel or fuller, made of tempered tool steel, for insertion in the hardy-hole of the anvil; a crucible holder, being an iron frame that can be placed on the forge over the fire, and useful for holding a crucible, glue pot, or soldering iron; one twist drill, and a pair of 18-inch blacksmith's tongs.

Novel Uses of Peat.

In Germany the uses to which peat has been put are many, and the consumption is constantly increasing. For bedding for stock only the second and third layers of peat are used. The blocks of peat are dried by air or in a kiln; they are then shredded by machinery, and then sieved, after which the peat is compressed and packed in bales by means of slats of wood and iron wire. The amount of bedding necessary per head of cattle is one hundredweight per year for every hundredweight of the animal's weight. Many sanitary and other advantages are derived from the use of this kind of bedding.

For fodder, only the top layer is used, which consists of moss and the fibers of partially-dried parts. The dried peat is then ground and sifted and mixed with molasses in the proportion of 20 to 25 of peat and 70 to 75 of molasses, obtained in the manufacture of sugar from beets. This product is guaranteed to contain 35 to 40 per cent of sugar. This fodder is used either alone or mixed with other food, as corn, potatoes, etc. The peat in this mixture counteracts the laxative effect of the molasses, and in the whole forms a wholesome food for horses, cattle, and swine; and as the acid of the peat seems to neutralize the alkalies of the molasses, the latter are rendered harmless, and the mixture has a sweeter taste than molasses alone. When due precaution is taken, the mixture keeps well. Horses fed with this develop glossy coats, gain in appetite, and are free from colic. Neat cattle are said to become less subject to "foot and mouth disease," and in the case of swine thus fed, that the unpleasant smell of butyric acid disappears from the sty and disease generally diminishes. The addition of 4.4 pounds to the daily feed of milch cows is said to increase the daily yield of milk about 0.55 gallon. In the province of Hanover from 10,000 to 15,000 tons are used every year, while Germany as a whole consumes 150,000 to 200,000 tons.

The value of peat for fuel is shown by the fact that it contains 54 per cent of carbon against 50 per cent in wood, 70 in soft coal, and 83 in hard wood.

The so-called "Torfmull," or turf dust, is sifted out of peat and used for packing fruit, such as tomatoes and other products, while "Mull," a by-product of peat, is used in potash works as a filter.

Owners of cabin power boats should be made cognizant of the danger from fire in the use of jump-spark ignition. Even in open boats a timer on the crankshaft is a potent element of danger. All timers should be on a level with the top of the cylinders, with coils always above the engine or fastened to the washboard, and under no consideration of convenience in a locker or in any other confined space. Manufacturers are becoming alive to this danger, as evidenced by the many engines already designed to use an inclosed timer, that formerly used the less safe system. At the break of the contact there is usually a spark, and if gasoline vapor should happen to be present, mixed with the proper proportion of air, an explosion and fire would result. This is decidedly more likely to happen where the timer is on the shaft, in the lower part of the boat and where it is unprotected by a cover.