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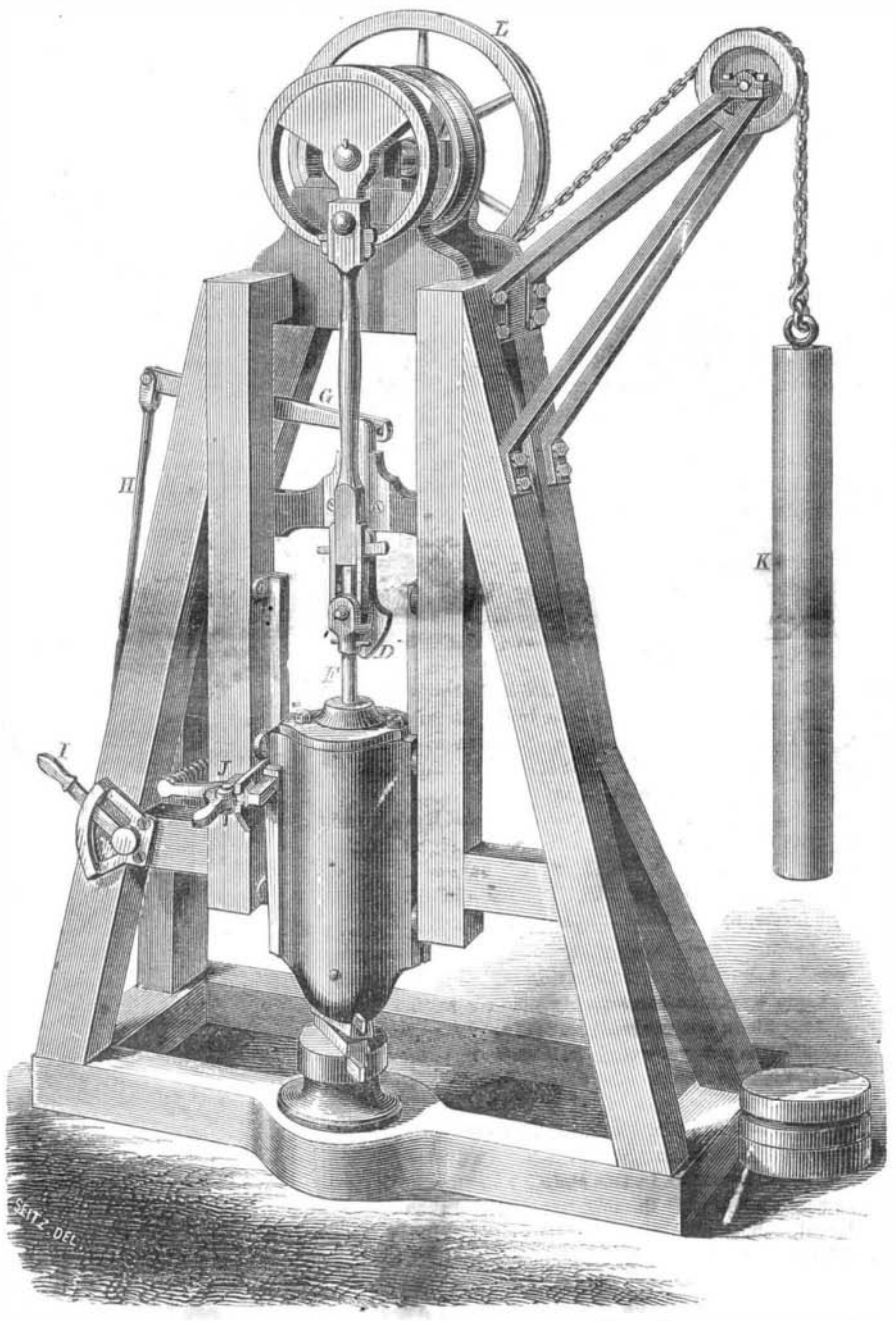
Improved Vertical Trip Hammer.

The old fashioned lever trip hammer, the use of which is beyond the memory of the "oldest inhabitant," is being superseded by direct stroke hammers, occupying far less space and performing their work much more satisfactorily. It is well known that the ordinary trip does not deliver a square blow except on a thin piece of work, and that its variation of stroke is confined, mainly, to a diminution in the number per minute, rather than to the amount of force exerted; so that for light work a light hammer must be used, and *vice versa*. The steam hammer is the master-piece of improved dead stroke hammers for heavy work, but it is expensive and not applicable to general work. Between this and the old style trip hammer there are several other devices which, sharing in the advantages of the great steam hammer, possess all the merits of the trip with some marked superiorities. The one shown in the accompanying engravings depends for the force of the blow wholly upon gravitation—the weight of the hammer—yet it may be so governed as to strike a much lighter blow than its total weight would deliver.



TANDLER'S DRAWING AND UPSETTING POWER HAMMER.

The hammer and actuating machinery is mounted upon a suitable upright frame of wood, or iron, the hammer-head being hollow, as seen plainly in the section, Fig. 2, and traversing in upright slides, by means of a crank and pitman. The drop, an internal arrangement of the hammer head, is shown in Fig. 2. Two bars, pivoted at A, extend up through the cap of the hammer-head, as at B, and are held together by spiral or other springs, C, until forced apart by the rise of the hammer bringing the projections in contact with the V-shaped releaser, D, Fig. 1, which spreads the bars and releases the cross head or snug, E, Fig. 2, which is attached to the piston rod, F. This cross-head engages with the bars or levers by means of projections seen plainly in Fig. 2. The hight from which the hammer falls, and, in a measure, the weight of the blow, are governed by the hight of the releaser, which may be elevated or depressed by the lever, G; rod, H, and handle, I.

Further, to govern the force of the blow, one side of the hammer has inclines against which two spring clamps, J, operated by a handle, bear with any degree of pressure desirable, and they may be regulated by hand or foot as may be most convenient. From the foregoing description the action of this hammer may be easily understood.

Attached to the hammer-frame is a device for "upsetting" a shaft or heavy bar of iron, K, which is suspended by a wire rope or chain running over a sheave and around a grooved wheel, L, the groove of which runs out at the side on one part of its periphery, allowing the bar to drop upon an anvil fixed underneath; the wheel end of the chain being secured to the center of the groove of wheel, L, insuring the return of the chain or rope and the raising of the bar to be worked. The hammer and anvil dies are placed at an angle for convenience in operating the trip and regulator.

Patented through the Scientific American Patent Agency, August 27, 1867, by Joseph Tandler, Grand Rapids, Mich., who offers state rights for sale.

BETTER waste oil than wear journals; yet wasting of oil is unnecessary if common sense guides its use.

COPPER AND BRASS WORKING.---THE ANSONIA WORKS

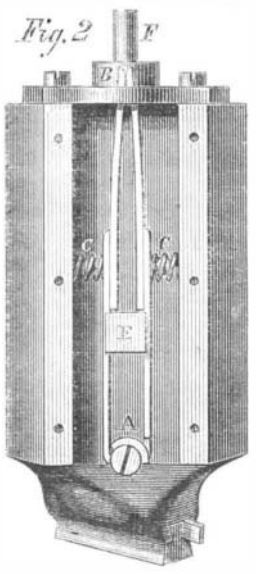
The degree of proficiency attained in working of metals seems fitly chosen to serve as a criterion in determining the grade of advancement in civilization of any age or nation. Favored by some such fortuitous circumstance as the burning of the forests, the existence and mode of reducing the more fusible metals would be revealed to the dullest comprehension, and it is evident that no great amount of skill or ingenuity would then be requisite to enable the savage to fashion a few trinkets or the rudest implements. Metallurgical knowledge among the lowest races generally is confined to an acquaintance with the precious metals, which are made by them to subserve many of the uses for which iron is employed by civilized nations. The more difficult of fusion is the native ore, the greater the talent required for bringing it into subjection; and the skill which can take iron—itself entirely too refractory to be fused as easily as silver and gold, or even if brought to the metallic state by the intense heat of the furnace, could never be wrought with the same ease as the more malleable metals—and make it many hundred fold more precious, weight for weight, than the so-called precious ores, indicates in itself the high grade of progress of the present age.

A knowledge of the properties and value of alloys is evidence of a considerable advancement in the arts of life. Gold, silver, and copper, hardened by combination with tin, constituted the material from which were formed the principal weapons, tools, and metallic manufactures of the early ages, and of the half civilizations of modern times. To the alloy brass is popularly accorded a far greater antiquity than by right it is entitled to. The material is frequently spoken of in our English Bible, even Job mentioning it in the succinct treatise on metallurgy, given in the xxviii. chapter of that book; but the reference is here evidently to copper; and there is little doubt that wherever mentioned throughout the Scriptures, copper rather than brass is meant. Although the Latin word *æs* is commonly translated brass, it is stated that of all the specimens of ancient objects made from this material yet found, analyses have failed to discover a trace of zinc, the composition being nearly uniformly copper and tin. The employment of this alloy by the Romans was very general, coins, vases, culinary utensils, ornaments, arms, furniture, and musical instruments all being formed from it, while great attention was given to investigating the properties and studying the best combining proportions of the alloying metals.

The alloys of copper in variety and industrial value, are perhaps the most interesting of any that are worked. The term brass is of somewhat broad significance, including nearly all the alloys of copper; but in its most common acceptation and for the generality of purposes, the alloy bearing the name consists of two parts copper to one of zinc, but the proportions of these ingredients used in the arts are exceedingly various, being altered to suit color and other properties to the purpose for which the alloy is intended. Doubling the amount of spelter to copper, we obtain a gold colored brass, variously designated as Dutch Gold, Prince's Metal, Tombac, and Pinchbeck, the latter alloy having been made historical because coins made from it were forced upon the American Colonies as a circulating medium, thereby raising the righteous indignation of the Revolutionary Fathers, and forming one of the grievances demanding redress from the Mother Country.

A curious fact connected with making brass is that long before zinc was known as such, in its metallic form, the practice was universal of cementing granulated copper with calcined calamine and charcoal, in crucibles exposed to a bright heat. As a result, the zinc was liberated from its oxide and united with the copper, without becoming visible as a distinct metal. The alloy found in lumps at the bottom of the crucibles was remelted and finally cast. Even the latest edition of Webster's Dictionary recognizes only this primitive mode of preparing the alloy.

The preceding remarks were occasioned by a late visit to the extensive establishment of the Ansonia Brass and Battery Company, located in the thriving village of Ansonia, Conn. The village itself—which has now become the center of a large manufacturing interest, and is one of the most important towns in the famous Naugatuck valley—is indebted for not only its name but its very existence to the late Anson G. Phelps, of the firm of Phelps, Dodge & Co., of New York. Twenty-five years ago, this gentleman perceiving the value of water power which might be made available at this spot, selected the locality as the site for what has since developed into the various manufacturing establishments, all conducted under the name above mentioned. The products of the several mills are so well known throughout the country, that a brief note of the processes of manufacturing may prove of interest.



The shops of the company, four in number, as also five other factories scattered through the village, are driven by water power drawn from the Naugatuck river, at a point one mile north of the town of Seymour, and brought by a canal one and one-eighth miles long, under a head or fall of thirty-two and one-half feet, with a permanent power of fifteen feet drawn under a thirty-inch head. The copper-rolling mill, as the first built of the company's shops, is worthy of first notice. Previous to the war, most of the pig copper used in the mill was brought from South America, but now little is derived from this source, as the metal can be obtained at better advantage from the Lake Superior mines, intermediately being smelted at the Baltimore or Cleveland works. The ingots, or plates, on receipt are remelted, refined, and, for convenience, run into plates of uniform size and quality. The rolling of these plates, after a second heating, into long thin sheets; the annealing of the latter to restore somewhat their malleability; immersion in dilute vitriol to remove the black oxide and restore the characteristic pale-red tint of the bright metal; squaring and cutting into required sizes ready for shipment, are all processes too simple to be specifically described.

The brass mill is the most important establishment of the company's, and its several departments will admit of a somewhat fuller description. Lake Superior copper in ingots from the smelting works, as before, and blocks of spelter are