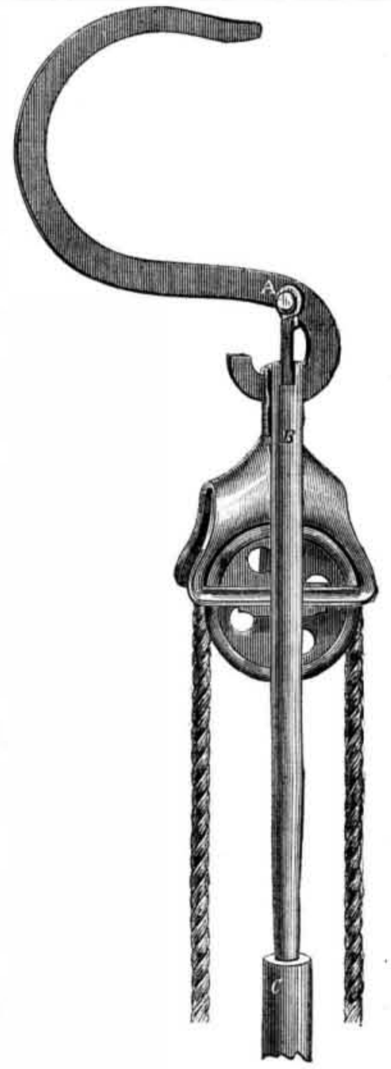
PULLEY SUSPENSION HOOK.

It is a dangerous and trying labor to suspend the upper pulley of a horse hay-fork from the meams over the hay mow, and troublesome to shift the point of suspension as the work proceeds. The engraving shows a very simple device to fasten such tackle without the necessity of climbing. It is a double hook of iron, the lower curve holding the pulley, and the upper intended to engage with a beam or any convenient projection. An arm is pivoted at A, which is secured to the wooden lifter, B, by which the hook, pulley and connections may be raised by a pole, C. By the same means the hook and tackle may be removed from place to place as required. This device appears to be adapted for a number of purposes where a hoisting tackle is required. It is the subject of a a patent obtained through the Scientific American Patent Agency, Nov. 13, 1866. All letters relative to the device should be addressed to Miller & Plants, Rollersville, Sandusky Co., Ohio.



KEILER'S LAMP CHIMNEY CLEANER.

The introduction of coal oil as a common illuminator has in a large measure superseded the use of common oil lamps and candles, but while it is vastly superior in light-giving qualities, it has its disadvantages, one of the chief of which is the annoyance of the glass chimney, which must be kept clean that we may derive the full benefit from the lamp; and this cleaning is a nuisance, as it is commonly performed. The implement herewith illustrated is intended to make this labor light, to insure a perfect cleaning of the interior of a shade without the expenditure of much time or the danger of breaking the glass. It is perfectly simple, merely a bladder or a bag of india-rubber, or other elastic, to be introduced to the interior of the glass and inflated to fill the whole space. The bladder is secured to the end of a hollow handle and may be covered with a cloth of cotton or woolen. Air is blown into the hole at A, and escapes through another aperture in the interior of the bladder. When the bladder is filled, which can be done in a breath, the thumb is placed over A and held while the glass is cleaned. This device will recommend itself to all housekeepers; and others who use glass shades and lanterns. A patent was issued for this improvement, Sept. 25, 1866, to Levi Keiler, whom address at Catawissa, Pa., for information in regard to state and county rights, etc.

Petroleum and Paraffine are manufactured in Wales and Scotland from the shale or refuse of the bituminous coal beds. It is estimated that about twenty gallons of crude oil are obtained from a tun of coal, and that between seven and eight millions of gallons per annum are manufactured in the retorts of Scotland alone. The principal supply, however, is from the oil wells of Pennsylvania.

A METHOD OF CONTROLLING THE PRODUCTS OF THE BESSEMER PROCESS.

PREPARED FOR THE SCIENTIFIC AMERICAN BY DR. ADOLPH SCHMIDT.

The greatest and till now unconquered difficulty in conducting the Bessemer process, is to determine exactly the moment when the process has to be interrupted for getting a product combining certain precise qualities. The most experienced engineers and managers in every country where the process is carried on, have not yet been able to find out a mode of working by which it might be possible to obtain with certainty exactly that kind of a product they wish to get at the time. Different ways have been proposed and tried to overcome that difficulty, but all have failed. This will not appear so very astonishing when it is considered that the time during which the process must be interrupted, if any kind of useful material is to be obtained, lasts no longer than about two minutes and a half, and that during this short period the metal passes rapidly through all the chemical and physical conditions between that of a very hard cast-steel and that of a soft and highly ductile wrought iron.

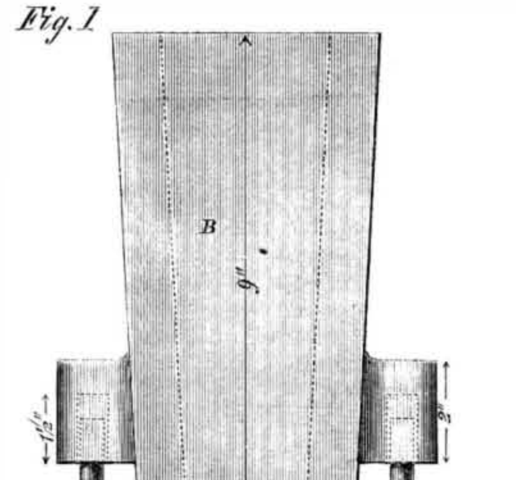
The only important progress that has been made in this respect is by the final addition of spiegel or other pig iron at the end of the process. This method facilitates beforehand, to a considerable degree, the acquirement of the desired result, because the moment when the metal is in the condition of wrought iron, or almost entirely decarbonized, it is easier to be recognized than any other, and the addition of more or less molten pig iron, after this moment has been observed, and the process is interrupted, offers a convenient expedient to effect a partial retrogression of the process and to obtain a more or less hard product. This invention was therefore a real and general improvement.

All the progress that has been made besides this, in the certainty of the results to be obtained by the Bessemer process, chiefly consists in the practical experiences and observations of men who possess such theoretical knowledge as is necessary for viewing the phenomena occurring during the process, in the right way, and for drawing from the facts the right practical conclusions.

But neither these more local improvements, nor the beforementioned method of working, have been able to overcome sufficiently the uncertainty clinging to the results of the process; and it is an incontestible fact that the quality of its product is generally very unequal, and quite uncontrollable during the course of the process. The consequences of this must evidently be very bad, and as injurious to the manufacturers of the raw ingots as to those who purchase to rework them.

When the ingots are cast, the manufacturers generally do not and cannot know what kind of metal they consist of, what qualities this metal has, nor what purposes it is good for. Only vague suppositions can be made by the manager of the process from the general manner of its going on, from the phenomena it exhibits to his observation during its course, from the appearance of the metal in its fluid and in its chilled state, and from the color and appearance of the slag. But how very uncertain such suppositions are, is known by every one who has often assisted in the process and noticed the illusive character of the phenomena observed. These appearances in the metal and slag are often equally deceitful.

Fig. 1



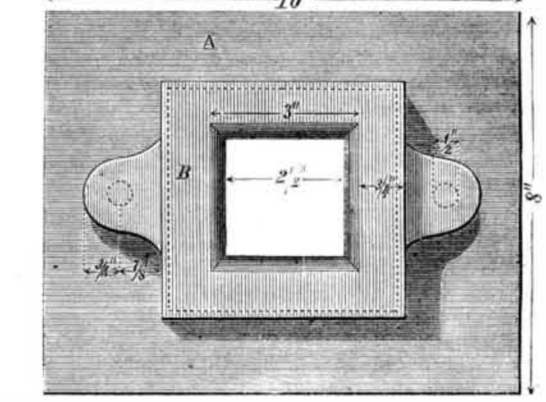
The ingots are sold afterwards or transmitted to those who have to work them, under the general name of "Bessemer metal" or "Bessemer steel," and it is not discovered of what kind and quality they are until after they have been heated and hammered or rolled, when it is too late to determine for what purpose they would suit best. So it happens in England. For instance, it frequently happens that ingots which would make first-class tires are used for plates, and make bad ones, and ingots which would prove an excellent material for making chisels and other instruments, are rolled out into rails, which prove to be poor and break.

In a word, bad or at least unreliable finished products are the consequence, which necessarily brings discredit on the process, spoils the market, lowers the prices, and, in general, hinders a rapid extension of this important branch of manufacturing business, as well as a rapid increase of the use of its products.

To prevent so disadvantageous experiences by the Bessemer manufacturers of this country, the following communication will indicate a simple and inexpensive method, by means of which every manufacturer can ascertain for himself the qualities of his ingots after every charge that has been made, and classify them according to their qualities. The method is a modification of one used in Austria with eminent success.

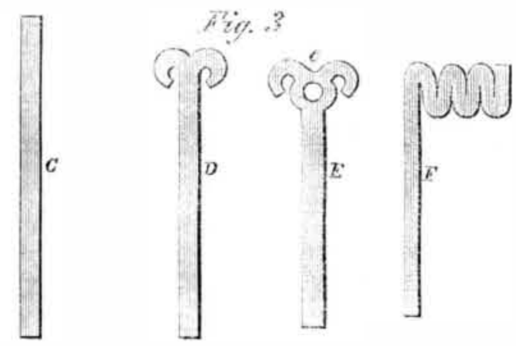
When at the end of every Bessemer charge the molten metal has been poured out of the inverter into the large ladle, it has to be left till the ebullition caused partly by the continued chemical action between the metal and the spiegel or pig, partly by the vapors still escaping from the lining of the ladle, has almost ceased. Then one or two ordinary ingot molds should be filled to get the small impurities and the less hot parts of the metal which sometimes stick to the bottom, out of the ladle; then somebody fills an ordinary small casting ladle with metal, and casts from it a small testing ingot, generally between ten and twenty pounds in weight, by pour-

Fig. 2



ing the metal into an iron mold prepared for that purpose. This operation may also be done directly from the large ladle by bringing its muzzle over the small mold; but the use of a well-dried and warm ordinary casting ladle is preferable for very small ingots. The shape of the mold is of no very great importance. I think, however, that the best shape is the one represented in the annexed engraving. It is that of a reversed trunk of a four-sided pyramid. The shape is pyramidal—though but slightly so—because the ingot is easier to be taken out of such a mold than out of one made like a straight column. The pyramid is reversed in order that the

Fig. 3



gases frequently developed during the operation of casting, may have a better escape, and that the slag or other light impurities may find a larger surface to be gathered upon. I propose the section to be quadrangular, because in this form the small ingot is easier to be seized and handled, and easier to be forged and rolled than with most other shapes, and because at the same time the ingot gets some angles which are sharp enough for the degree of fusibility of the hot metal to be observed by the aspect of the edges of the ingot. The mold is composed of two parts, both of cast iron. The bottom plate, A, is planed at the middle part of its surface. Two wrought-iron bolts are cast in it and stand out about an inch and a half over the top of two massive flanges about one inch high. The pyramid, B, planed at its smaller end, has two ears, about two inches high, with circular holes an inch and a half deep in the lower surface. These ears and holes are made so as to fit the position of the flanges and bolts on the bottom plate. These two parts of the mold are fixed together simply by passing the bolts of the plate into the holes or the ears of the pyramid, to prevent the mold from falling over during the casting operation. The mold has to be made very strong in all its parts and dimensions, so as not to break when the ingot is knocked out of it afterward. The weight of the ingot for testing may be between eight and twenty, and in single cases fifty or sixty pounds. In places where a proper rolling mill or good-sized hammer can be used, it will be well not to have this weight less than fifteen pounds. But where the whole testing operation has to be made by hand, smaller ingots are preferable. The dimensions of the mold depend upon the desired weight of the ingot. If the upper opening of the pyramid is made three inches square, the lower one two and a half inches square, and the hight nine inches, and if the mold is only filled with metal up to a hight of about eight inches, the upper part being filled with sand, ingots of good proportions and of somewhat over fifteen pounds in weight will be obtained.

Such an ingot can, when previously heated to a very light red and nicked, be easily broken, under a steam hammer, to show the fracture of the raw metal, if this is required.

As soon as the small ingot, cast by means of the mold above described, has hardened, the pyramidal part of the mold containing the ingot, is taken away from the bottom plate, set upside down on a frame a little wider than the large opening of the mold, but having the same form of section, and the ingot being still slightly red-hot, is knocked out by blows of a hand hammer on a piece of iron applied to the small end of the ingot in the mold.