Correspondence.

The Recent Fire at the Harrison Chemical Works.

To the Editor of the Scientific American:

We notice in your issue of the 12th inst. an item to the effect that during the recent fire at our works a large amount of chemicals were released from the burning building, which entirely destroyed the fire hose, and also that the firemen's lives were constantly endangered because of the chemicals in the neighboring buildings. Kindly correct this erroneous statement.

The building burned, one of a group of buildings devoted to the manufacture of alum, contained nothing but sulphate of alumina or alum, in solution or in bulk, in either case perfectly harmless. The nearest buildings were acid chambers, which were not injured sufficiently to release any acid, and even if these chambers had been destroyed, the acid could not have come in contact with the hose. The only hose destroyed during the fire was some 150 feet of our own, which was caught by the fire in an exposed position, and burned before it could be removed. The firemen were not exposed to any more danger than at any ordinary fire, as we do not manufacture, either in our alum works or in any of the rest of our factories, any explosive materials; and even had our chambers been destroyed or injured, none of the acid, or chemicals, as you call them, could have come in contact with the fire hose, owing to the peculiar construction of the buildings.

Mr. John R. Cantlin, Chief of the Philadelphia Fire Department, in a letter to us fully confirms our statement, and we beg you will correct your item.

HARRISON BROS. & CO.,
C. LELAND HARRISON.

Philadelphia, June 17, 1886.

How to Increase the Efficiency of Dynamo No. 161.

To the Editor of the Scientific American:

I have just constructed for lecture purposes in this school a dynamo electric machine like that described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, and I have found it possible to increase its efficiency very much by a change in the manner of making the connections, which may be of interest to others who have the same machine.

I connect the brushes with the extremities of the wire passing round the field magnet, thus closing what may be called the inner circuit. I again connect the brushes for the outer circuit. This connection is very effective where the outer circuit has much resistance or is subject to interruption. The greater the resistance in the outer circuit, the stronger the field magnet becomes and the greater the electromotive force of the current. If the outer circuit, is broken, the field magnet, instead of losing its magnetism, becomes stronger, since its coils receive all the current.

Connected as I have described, the machine will decompose water or work a telegraph instrument at a very low speed; and at a high speed will easily raise to a red heat from eight to ten inches of platinum wire, No. 36. It will also run a small arc light or several small incandescent lamps.

When the resistance of the working circuit is very low, and only then, the connections are best made as described in SUPPLEMENT, No. 161.

Of course, I am well aware that this application of short circuits is well known to electricians, but doubtless many who have made and are using this little machine do not know of it. C. FESSENDEN.

P. S.—To change the circuit, as above, it is not necessary to make any change in the construction of the machine. Taking Fig. 3 of description in SUPPLEMENT, No. 161, join *n* and *v* by a straight stout wire, and take the current for outside work from *p* and *v* or from *p* and *n*. C. F.

High School, Napanee, Ontario, Can., June 21, 1886.

Peculiarity of Indian Castings.*

The importation of partly manufactured material is at present exercising considerable influence over many of the native arts of Oriental countries and India. The supply of machine made thread has doubled the village handlooms in some districts of Madras, and gold thread from Germany has enabled the brocade weavers to compete with the imitation brocades sent in from Europe. In some handicrafts, however, the supply of European material has produced a contrary effect. Iron and steel, bar and rod, have displaced an ancient industry, and sheet copper and brass have robbed the founder of half of his work. Formerly the only means of producing sheet metal was by hammering cast plates, an expensive method only resorted to when thin flat coverings were required for wooden or other objects. For very large vessels, where weight was required to be kept down and strength maintained, hammered sheet was used; but generally the founder was employed, to save as much as possible the labor of forming the furnished castings, which required but little beating out, trimming, and brazing. In the case of a bowl or flat jar with a narrow mouth, the founder would prepare a cast not unlike in shape and thickness that of an ordinary flower pot saucer, from which, by constant hammering, the bulbous sides would be formed, projecting beyond the rim, which would remain of its first diameter and thickness. When finished, such a vessel would be nearly double the size of the first cast, and a remarkable example of the native knowledge of the composition of bronzes and annealing processes.

It is worthy of noting that the chief means of detecting modern from old Persian and Saracenic metal vessels is by examining the brazing joins, which in ancient vessels are rare. When not found, a close examination will show the vessel to be a thin casting, the ornamentation being by inlay or chasing and hammering, which, being done after the cast is made, gives the reverse side the appearance of chased sheet metal. So far as I could ascertain, there are three methods of casting practiced in India. The first by moulds in sand; the second, moulds in clay not unlike plasterers' piece moulds; the third, clay moulds formed on a wax model, the *cire perdu* of Europe. The first of these is well known in Europe, but the second is, I believe, now described for the first time.

In preparing the mould, impressions of the various parts of the pattern are taken in clay, and these pieces when nearly dry are, after trimming, stuck neatly together, and kept in place by several layers of mud, in which some fiber is mixed. The mould when ready has but one vent, which, placed on the most convenient side, is carried up into a sort of bottle neck. If the object is small, several moulds are attached together, and the vents united by a single short neck of clay, to which a crucible, inclosed in an egg-shaped ball of clay, is attached. The size of this crucible depends upon the exact amount of metal required to fill the mould or moulds; and this quantity being known by experience, the founder places it inside before closing it up.

No provision is made for the escape of air from the mould when the metal is poured in. The mould and crucible (now in one piece) is allowed to dry; and after several coats of clay, tempered with fiber, have also been well baked on by the sun, the furnace is prepared. This is simply a circular chamber about 2 feet 6 inches in diameter, 2 feet in height, with a perforated hearth and no chimney. Half filled with charcoal, a good heat is obtained by the use of several sheepskin bellows from beneath. When ready, as many moulds as the furnace will hold are placed in it, the crucible end of each being embedded in the fire. A cover is placed over, and the fire kept up until upon examination the moulds are found to be red hot. They are then taken, one at a time, and replaced in a reverse position, the crucibles being now above. The metal flows down into a red hot mould, and penetrates the finest portions of the surface without suffering from air or chilling. The fire is allowed to gradually cool, and when the objects are broken out of their clay covering, the metal is soft and malleable.

The third manner of casting (that by the use of a wax pattern which is destroyed in the moulding) is well known, but in one particular case the process has been carried further than would be at first believed, and of this I will now attempt a description.

The object produced is an anklet, a flexible ring about 4 inches in diameter, made from an endless curb chain. Such curb chain trinkets are common in India, and are generally made from thick silver wire rings interlinked and soldered one by one. In this example the anklet is made of bronze, and consists of a complicated chain of 43 detailed links, the whole being cast by a single operation. The first part of the process is the preparation of a pattern in wax, a delicate work, each link having to pass through four others, and to bear three small knobs or rosettes. These are in two instances but ornaments; the third, however, serves as a channel for the metal to enter each ring. Then commences the most difficult part of the work, each ring having to be slightly separated, and this is effected by painting in a thin coat of fine clay until there is sufficient to form a partition. Other coats of clay are added until a thickness of about half an inch is attained, when a groove is cut round the upper side of the ring, and deepened until the row of knobs is bared. The wax is then melted out, and the mould attached to a crucible as before described. When cast, and the mould broken away, the chain comes out inflexible, being attached to a rod which runs round where the groove is cut. This is broken off, and the chain is complete.

The president of the society before which the paper was read, in proposing a vote of thanks to Mr. Clarke for taking so much trouble in obtaining the specimens exhibited, said that they were very extraordinary things, and the subject was well worth considering carefully. The mould and the crucible were fixed together, as they could see. He knew that Mr. Clarke had had the opportunity of seeing a good many metallurgical processes as practiced in India, and he was very much struck by one point mentioned, namely, the very great use made in India of highly heated moulds, and which he considered was a subject deserving of considerable attention.

*C. Purdon Clarke, C.I.E., Keeper of the Indian Section, South Kensington Museum, as reported in the London *Iron Trade Exchange*.

Petroleum in Egypt.

The recently discovered oil fields in the region of the Red Sea have been carefully examined by Mr. Daley, a Belgian engineer, and promise to be of considerable importance. The entire peninsula of Gimsah, where the oil has been found, is of volcanic structure, and devoid of the slightest trace of vegetation or fresh water. The first oil borings were made at a distance of 400 feet from the sea. At a depth of 156 feet, a copious flow of oil was obtained. It is estimated that 3,200 barrels were discharged in 24 hours, and the flow has since been maintained at the same rate. The petroleum is of a dark greenish color, and limpid. It is mixed with salt water, and discharges carbonic acid gas. By allowing it to stand for some time, the salt water settles to the bottom, and may be drawn off. The surrounding country is quite uninhabited, on account of the absence of drinking water and vegetation. All provisions are supplied from Suez. The climate, however, is healthful, and the otherwise intense heat is moderated by frequent winds.

The Egyptian Government is disposed to do everything necessary for the development of the new industry. Jetties are being constructed, so as to allow vessels to be loaded directly at the wells. It is probable that most of the crude oil will be taken to Cairo for refining.

DECISIONS RELATING TO PATENTS.

U. S. Circuit Court.—Northern District of Illinois.

OHIO STEEL BARB FENCE COMPANY *v.* WASHBURN & MOEN MANUFACTURING COMPANY *et al.*

Gresham, J.

A court of equity will not specifically enforce a contract at the instance of one of the parties who has repeatedly broken it, even if the other party has been guilty of the first breach.

If one party to a contract expects to have it specifically enforced against the other, he must act steadily in good faith, by observing its terms, whether the other party violates his covenants or not.

When a party to a contract has not kept his covenants, but excuses himself on the ground that the other party was guilty of the first breach, whatever remedy there is is at law.

U. S. Circuit Court.—District of Indiana.

HUDNUT *v.* LAFAYETTE HOMINY MILLS *et al.*

PATENT HOMINY MILLS.

In a suit on reissued letters patent No. 10,057, of March 7, 1882, to Theodore Hudnut, it was shown that one of the alleged infringing machines was made in accordance with an earlier patent, and therefore *held* that such machine was not an infringement.

It is not competent for a patentee, by a reissue of his patent, procured after a delay of more than ten years, to so enlarge the scope of his invention as to cover devices patented in the mean while, which were not embraced in the original.

Maryland Court of Appeals.

SCHWARZENBACH *v.* ODORLESS EXCAVATING APPARATUS COMPANY.

Ritchie, J.

Money paid for a license to use a patented invention on representations made in good faith that the patent is valid cannot be recovered back, although the patent turns out to be void.

In such a case, the general principle applies that where a party with full knowledge, actual or imputed, of the facts, there being no duress, fraud, or extortion, voluntarily pays money upon a demand, though not enforceable against him, he cannot recover it back.

A licensee who has paid, or agreed to pay, an annuity in consideration of a license to use a patent privilege which he has had the benefit of, cannot recover back the money or avoid its payment, if not already paid, on the ground that the patent is void.

A Fish Drying Machine Wanted.

A Florida correspondent writes that a demand now exists among the water farms and fisheries on the Gulf coast for a convenient and inexpensive machine for drying fish so that they may be shipped to distant markets, in the same manner that the fruits of the South are now distributed in dried form over large areas of less fertile country. He suggests that some of the readers of the SCIENTIFIC AMERICAN may turn their inventive genius in this direction. According to the De Funiak Springs (Florida) *Signal*, a premium will be offered for the best machine for this purpose exhibited at their autumn fair.