The Manufacture of Needles.

From a lecture on "Steel in Modern Times," by Mr. S. Perissé, reproduced in a recent number of the *Revue Scientifique*, we take the following notes on the curious and interesting needle manufacturing industry:

The needle, says Mr. Perissé, passes through the hands of eighty workmen before it is ready to deliver to the trade; and, if we take into consideration that these articles cost at the very most only $2 per thousand, on an average, we find that the 8,000 operations are remunerated by the sum of 20 cents.

Owing to the progress effected in the art of drawing steel into wire, cast steel has been principally employed for some years past. Formerly, in France and Germany, manufacturers used iron wire, which was converted into steel during the course of the operation. The manner of manufacturing differs but little. At Borcette, the center of needle production of the continent of Europe, there are five series of operations involved in the manufacture: (1) Conversion of the wire into needles in the rough; (2) tempering and annealing; (3) polishing; (4) softening of the polished needles; (5) putting up into packages.

1. *The Conversion into Needles in the Rough* involves twenty operations, the principal ones of these being gauging the wire, cleaning, reeling, and cutting into pieces of a length equal to two needles. Sharpening or pointing is done by means of grindstones. By the aid of a leather thumbstall the workman holds fifty wires at a time. The latter become red hot by friction on the stone, and a constant stream of fine particles of steel and stone is thrown off, which formerly brought about phthisis in the workman after a time, but the adoption of powerful ventilators has now remedied all that. After pointing, the wire is cut in two, the head is flattened, and it is then annealed. Then the eye is punched in the head by means of a steel punch, the operation being performed by children in less time than it takes to describe it. Other children "hole" the needles, that is, remove the particle of steel detached by the punch. After this the heads are hollowed, sorted, and, when necessary, cemented.

2. *Tempering and Annealing* of the raw product requires nine operations, but they are performed with lots of 30 pounds weight, each containing more than 300,000 needles.

3. *Polishing* is the longest operation, although a million are polished at once. It requires five operations, each of which is repeated seven or eight times. The needles are put into rolling cylinders along with small hard stones and oil of colza. The stones gradually become crushed, and the friction of the particles during the motion of the rollers effects the polish. The last polish is performed with oil alone and coarse bran.

4. *The Sorting of the Polished Needles* involves five operations, and, after burnishing, which is a very delicate and important process and that which gives the luster, the needles undergo the last operation of being put up into packages.

IMPROVED HORSE HAY-FORK.

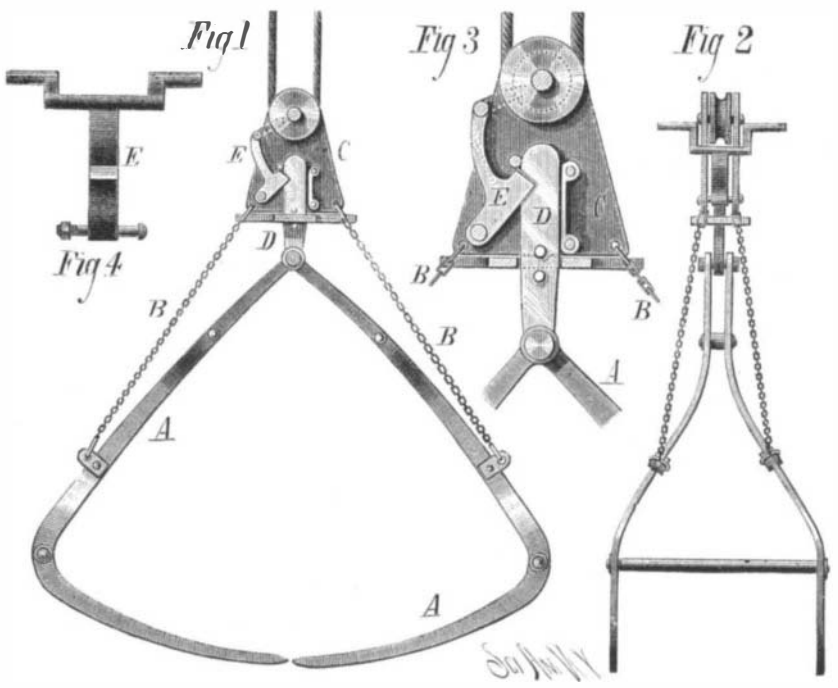
We give an engraving of an improved horse hay-fork recently patented by Mr. Townsend Albertson, of Mineola, N. Y. This fork, although very simple in its construction, is very convenient and easily managed, and is perfectly automatic in discharging its load.

The general form of the fork is shown in Fig. 1, and Fig. 2 is a side view, showing the double arrangement of the fork. Figs. 3 and 4 are detail views of the catch and releasing mechanism.

The fork tines are curved inward, as shown in Fig. 1, and are connected in pairs by a crossbar, as shown in Fig. 2. The shanks of the tines are hinged together at their inner ends, and connected with a catch, D, carrying a horizontal plate. The shanks of the tines, near the bends, are attached to chains. B, which are connected with the lower corners of the plates of the pulley block, C. The fork is raised and lowered and carried along by a rope that passes under the pulley in the block.

A latch, E, is pivoted between the plates of the pulley block, C, and is capable of engaging a notch in the catch, D, when the latter is pushed up into the pulley block. The latch, E, is provided with trip arms (as shown in Figs. 2 and 4), which engage with cleats or other stops on the track upon which the carriage runs.

When the fork is drawn back and lowered upon the load the tines are separated and supported by the chains, B. As the tines are thrust into the hay their curved shape causes them to move inward slightly, and the pulley block, C, is drawn downward so that the catch, E, will be engaged by the latch, E. When the pulley block is raised by the rope the load is lifted more or less by the catch, D, and when the load is carried to the point where the latch, E, strikes a stop and releases the catch, the load drops.



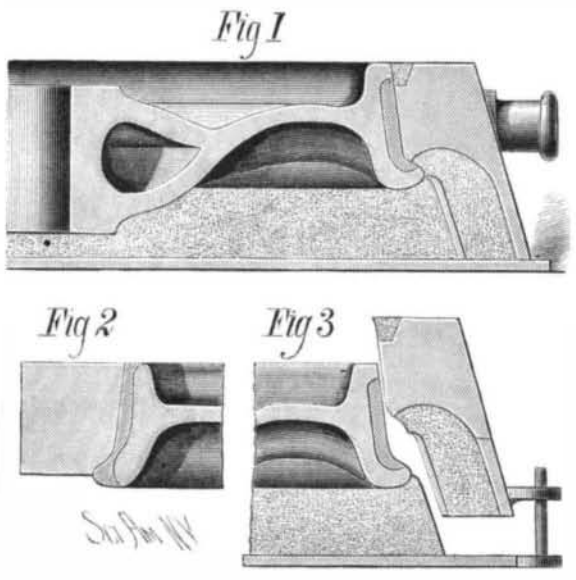
ALBERTSON'S HORSE HAY-FORK.

Lemon Juice in Diphtheria.

Dr. I. R. Page, of Baltimore, calls the attention of physicians, in the *Medical Record*, to the topical use of fresh lemon juice as a most efficient means for the removal of membrane from the throat, tonsils, etc., in diphtheria. He states that in his hands it has proved the best agent that he has as yet tried for the purpose. He applies the juice of the lemon to the affected parts every two or three hours by means of a camel's hair probang. In eighteen cases in which he has used the remedy the effect has been all that he could have wished. He finds that several of his professional brethren are prepared to give the same favorable account of the remedy.

IMPROVEMENT IN CASTING CAR WHEELS.

Considerable interest has lately been aroused among railway managers in favor of what is known as sand flange car wheels, and a great deal is claimed for them on account of their superior strength, durability, and largely increased mileage. All past attempts to make sand flange wheels have been mere experiments, and, as a rule, have been failures. It must, therefore, be inferred that the means heretofore employed for moulding them have not been satisfactory, and the results too uncertain to be appreciated or adopted by the practical wheel makers, many of whom have strong preference for sand flange wheels.



TAWCETT'S IMPROVEMENT IN CASTING CAR WHEELS.

Fig. 1 in the engraving is a section of the improved flask for moulding the flange of chilled car wheels in sand, showing the position of the flask when rammed full of sand. The inner or dividing ring, B, is made conical, and serves as a parting line for separating the two bodies of sand, and allows all the sand under the pattern to remain in the usual manner on the bottom plate, A, as shown in Fig. 3, and by its peculiar construction carries the sand that has been rammed on the upper side of the flange and holds the sand between the rings while the flask is being lifted off to allow removing the pattern and finishing the mould.

This form of a flask combines the best and most desirable features of construction, and is designed for long-continued regular work. This method of moulding insures neatness and cleanliness in carrying on the work and obviates the necessity of loose parts. Where economy in moulding, combined with accuracy in casting, is an object to be accomplished, this flask has been found very satisfactory.

Fig. 2 is a section of the ordinary chill, showing the chill in contact with the flange of wheel, and its effects on the rim of the wheel.

Further information in regard to this invention may be obtained by addressing W. Tawcett, Omaha, Nebraska.

Poteline.

The *Chronique Industrielle* states that M. Potel has recently communicated to the French Société d'Encouragement a new compound, which may be employed for preserving meat and hermetically sealing bottles, flasks, etc., or for making an artificial marble for the manufacture of various useful and ornamental articles. It is composed of glycerine, gelatine, and tannin. To preserve meat the inventor covers it with this new product, rendered liquid by exposure to a temperature of 90° to 100° C. The compound hardens very quickly and prevents access of air to the inclosed meat. When it is desired to offer the latter for sale the covering is simply torn off. The inventor has made many experiments during the past year, and has found that meat coated with the product could be kept from thirty to sixty days, and at the end of that time be apparently as fresh and sweet as any meat exposed for sale by butchers.

Sulphate of baryta or zinc white may be added to the compound to make it opaque, and it may be dyed of any desirable tint by means of ordinary vegetable colors when employed for ornamental purposes.

A Large Raft.

An unusually large raft of timber was recently floated down the Hudson. It was 900 feet long and 34 wide, and contained 254 pine logs, varying from 70 to 96 feet in length and from 18 to 30 inches in diameter. The logs were cut during the past winter in Ontario, Canada, near Capetown, Linden, and Onondaga. They were floated down to Toronto, on Lake Ontario, and on June 24 last they began their journey to Boston, in care of Capt. Edward Locke. They were made into a raft, and towed in three days and a half across the lake to Oswego, where they were separated into two rafts of six cribs each and a third raft of seven cribs. These were towed through the Erie Canal by John Wells, of Oswego. The journey occupied thirty-one days. The three rafts were then united into one large raft with two sections abreast, and floated down the river, traveling only on ebb tides. On its arrival at Gowanus Bay, Brooklyn, the raft was prepared for towing to Boston. The logs were chained together, and 113 logs from Pennsylvania were added, making a raft 1,300 feet long and 64 feet wide. The value of the raft was put at $25,000. The cost of towage $3,500, or one-third less than it would have cost to send the logs by rail.

Sensibility of the Telephone.

Every one knows that the very feeblest currents produce audible sounds in the telephone, which is more sensitive than any galvanometer to feeble currents. M. Pellat lately declared that the heat necessary to warm a kilogramme of water one degree would, if converted properly into the energy of electric currents, suffice to produce in a telephone an audible sound for ten thousand years continuously.

Carbon Electrics.

The galvanic properties of carbon have been closely examined by Dr. Hanichi Muraoka, a Japanese student at Strassburg. He determined the specific resistance and the change of resistance with increase of temperature of all kinds of hard carbon, including Siberian graphite, gas-retort carbon, the artificial carbons used for electric lighting by several well-known firms, and even the graphitic compound used in Faber's lead pencils. The specific resistance (at 0° C.) of the last was 952, while that of the first was 12·2. The artificially prepared carbons ranged from 36·86 to 55·15. In all, however, the resistance *decreased* with a rise of temperature, the coefficient of decrease being greatest for the Siberian graphite, least for a carbon pencil prepared from coke by Heilmann of Mühlhausen. This result entirely confirms the recent researches of Siemens and Beetz.

The thermo-electric powers of the various samples of carbon were also determined, with respect to that of graphite; their thermo-electromotive force was in every case + to graphite, and varied from 423 microvolts for the Faber pencil carbon to 9·26 microvolts for the gas retort carbon (of Parisian manufacture) used for battery plates.

A Railway on Stumps.

In the upper part of Sonoma county, Cal., a railroad track crosses a deep ravine upon the upright trunks of tall trees, which have been sawed off upon a horizontal line. In the center of the ravine a firm support is furnished by two huge redwood trees which have been lopped off seventy-five feet above the ground.

Sewing in a Boston Public School.

The Boston papers give favorable accounts of the recent exhibition in that city of the results of the instruction in sewing in the Winthrop School—a girls' school with six grades. In the three lower grades they have lessons of an hour each twice a week, and in the upper three classes once a week. The pupils furnish their own work, bringing the materials from home, the city having no expense except for needles and thread, in cases where the parents do not sup-