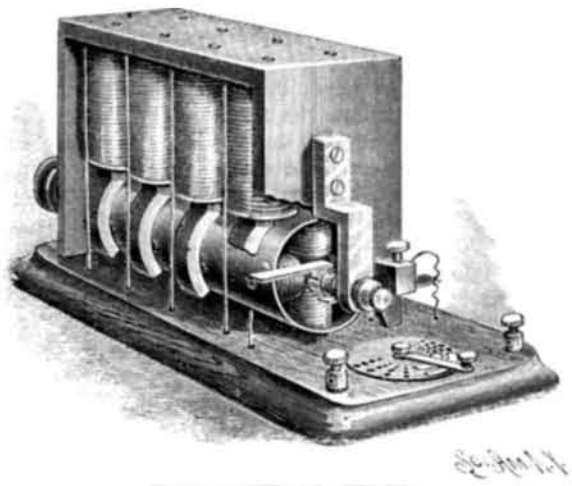
AN EASILY REGULATED ELECTRIC MOTOR.

The simple and effective motor shown in the illustration, in which the current may be readily regulated and easily reversed, has been patented by Mr. Harlon F. Ong, of Newberg, Oregon. It has a compound field magnet formed of a series of field magnets furnished with separate polar extensions, a compound armature formed of a series of armatures arranged upon a shaft and corresponding in position with the polar extensions of the field magnets, and a multiple switch for sending



ONG'S ELECTRIC MOTOR.

the current through one or more of the field magnet sections in either direction. A commutator is connected electrically with the armature sections formed of two rings, each divided at diametrically opposite points, the divisions of one-half arranged ninety degrees distant from those of the other part, and a pair of commutator brushes is held in contact with both of the commutator rings. By moving the switch arm a limited distance to the right, the current from the battery passes in one direction through one section of the field magnet; by moving the arm farther the current flows through two sections, in the same direction, and so on throughout the series. When the switch arm is moved to the left, the current is made to flow in the opposite direction, thereby reversing the direction of rotation of the armature, the current being sent in a similar manner, as desired, through one or more sections of the field magnet, whereby the power of the motor is regulated.

Mr. Edison Honored.

The London Society of Arts prize, consisting of a medal, the prize having been founded in memory of the Prince Consort, has been awarded to Thomas A. Edison. The medal has previously been awarded to Faraday, De Lesseps, and many of the other great scientists.

A COMFORTABLE READING CHAIR.

In using the chair shown in the illustration, the occupant is supposed to sit crosswise of the seat, as one would sit in a saddle, resting the elbows on the arm-pieces near the top of the back, the book then being supported in a convenient position for reading on an inclined table attached to the rear uprights. Such a chair in a library or study, or elsewhere, affording convenient opportunity for such changes of position from the usual posture as are often sought, cannot fail in many cases to contribute materially to one's comfort. The picture is very nearly a representation of a chair used for many years by the Duke of Wellington, at Walmer Castle, England, and now carefully preserved there. The duke died at this castle September 14, 1852.

A DUKE OF WELLINGTON" CHAIR.

The Use of Eyeglasses.

One of the first concomitants of age is acquired far-sightedness or presbyopia. This necessitates wearing certain glasses for near work.

Whenever a man or woman about forty-five years of age finds himself or herself reading or threading a needle at arm's length, their action tells that the little muscle governing the accommodation is growing weak and needs assistance. By persisting in forcing this muscle to work, much injury is done to the eyes, but by having it corrected, many a frown would be saved to man and many a wrinkle to woman.

Not only is it important to get glasses, but of more importance still is it to see that you get the kind suitable for each eye. It is comparatively rare that you find two eyes exactly alike, and the aid of an ophthalmic surgeon, who is not only competent theoretically but practically, should be sought.

Men whose knowledge is acquired by long experience are often much more useful than those having a theoretical knowledge only. When the optician finds, however, that the vision is not the same in each eye, or where astigmatism exists, and patient complains of symptoms now recognized as eye symptoms, then his province ends and the ophthalmic surgeon's work begins.

At one time the druggist could exercise the prerogatives of the physician; is it of lesser import that the optician should assume the prerogatives of an ophthalmic surgeon? If the law now prevents the one from prescribing drugs, the other should also be prevented from prescribing glasses, outside of a certain range of years or certain physiological conditions.

As age increases, excessive reading, writing, or work upon very small objects must not be persisted in, especially if the eyes grow tired. It must be remembered that the elasticity of the eyeball is lost, and any persistent effort may produce hemorrhage in the retina, or such a strain as may lead to other serious troubles.

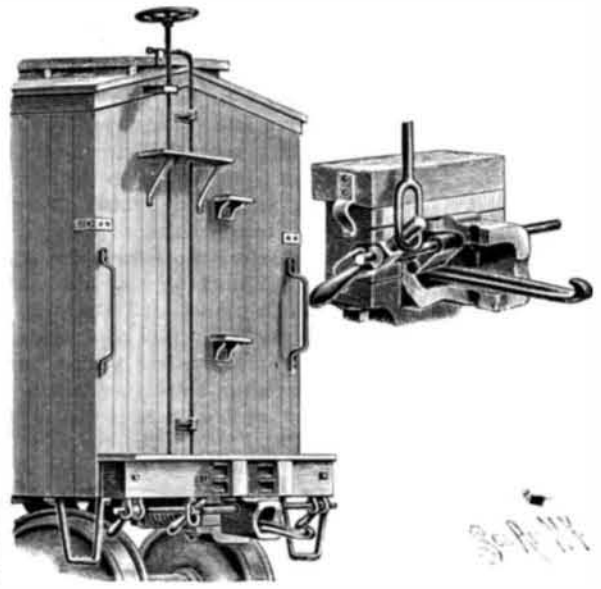
Old people should be careful not to read with a strong artificial light falling on a white glazed surface. And the *Industrial World* concludes: It would be better for such people if our monthly magazines were printed on paper of a neutral tint.

Not as Easy as it Seems.

You may not think it is much of a task to be foreman or superintendent of a factory or other manufacturing establishment, says the *American Machinist*, but try it and see, and you will find that it is not the easy job it may seem to the observer. Imagine yourself with from fifty to a hundred men, or even less, and plan out each day's work so as to have work ready for the men as fast as the last job is finished. You must estimate the time it will take this man to finish the job, so the next man can have it in time to start on with it as soon as his present work is completed. You must judge of the time a man should occupy on a job, and also the cost of material in the same, must know whether he is making it right or not, and whether at his present rate he will get it done in time for shipment according to contract. If not, he must have help on it. When you consider all these features, the responsibility of managing the whole place, and, if the judgment proves faulty, of being solely responsible for the loss, it is not an easy task after all.

AN IMPROVED CAR COUPLING.

The coupling shown in the illustration is designed to be simple and durable in construction, very effective in operation, and easily operated for coupling or uncoupling from either the side or the top of the car. The improvement has been patented by Mr. Reuben Quatermass, of Moline, Kansas. The coupling link is in the form of a flat bar, with its ends somewhat narrowed, and on each end a turned-up head forming a hook, the link also having a longitudinal slot adapted for engagement with an ordinary coupling pin when connecting with a car on which is used the pin and link coupling. Secured on a transverse shaft, journaled in bearings in the drawhead, is a plate whose rounded-off lower end is adapted to engage the hook of the coupling link, the edges of this plate having pins which move in segmental grooves at its side in the drawhead, as the plate is swung upward and downward, by means of handles at the side on the transverse shaft, or the rod connected with this shaft which leads to the top of the car. When the plate is held horizontally the link is disengaged, but when it is at an angle of about forty-five degrees it is free to engage the head of the link. The shaft on which the plate is held is journaled in elongated openings, so that when a pull is exerted on the plate by the link, the upper or outer end of the plate will abut against a bearing in the under side of the top of the drawhead, thus relieving the shaft of all strain. On each of the handles at the sides is a link adapted to engage a hook on the car, to lock the shaft and plate in position, and one of the handles is preferably adapted for engagement with a spring catch to facilitate the engagement or detachment of the link. When the plate is in its lowermost position, an entering link swings it backward until it passes the head of the link and drops into engagement therewith, the handles adding weight to the plate to hold it in engagement with the link. In uncoupling, the cars are backed till the link slides rearward, when the handles are turned to swing the plate upward out of engagement with the link. In case of one of the cars leaving the track, the turning of the link to one side



QUATERMASS' CAR COUPLING.

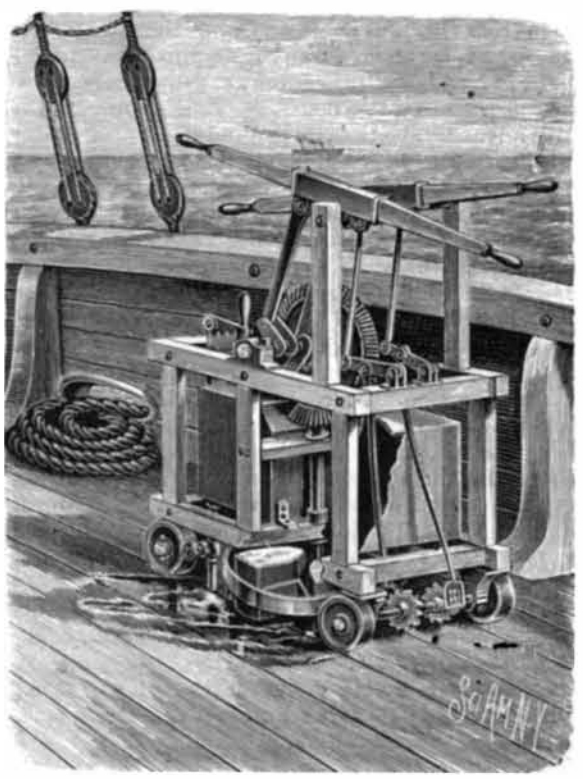
would effect its disengagement, so that the following car would not be derailed.

A MACHINE TO HOLYSTONE A VESSEL'S DECK.

The illustration represents a machine by means of which holystones may be moved in any direction across and in frictional contact with the surface of a vessel's deck, being rotated and resting freely thereon, while water and grinding material are at the same time supplied in their path. A yoke extends upwardly from one axle of the machine and is attached to a vertical shaft terminating in a crank arm, by means of which the machine may be steered, the crank arm being adapted to engage a rack. A transverse shaft, having two crank arms near the center of the frame, is connected by links with walking beams above, and the crank shaft has an attached bevel gear meshing with a bevel pinion on the upper end of a vertical shaft to which is attached a stone carrier, consisting of a skeleton frame containing a number of pockets. In the pockets are loosely fitted the stones, which feed downward by gravity as their under surfaces are worn away. By the rocking of the walking beams a rotary motion is given to the carrier containing the holystones, whereby the deck may be expeditiously cleaned.

Within the frame of the machine are held two tanks, one containing water or other liquid, and the other an abrading material, each tank feeding its contents in suitable proportions, according as the valves in their discharge pipes may be adjusted. The machine is moved forward and backward by means of dogs engaging ratchet wheels on the axle at one end, the upper ends of the dogs being adjustably and pivotally attached to levers fulcrumed on the frame, these levers being connected by links with the walking beams.

Further information relative to this improvement may be obtained by addressing the patentee, Capt. Samuel Lowberg, in care of Mr. E. C. Benedict, No. 29 Broad Street, New York City.



LOWBERG'S DECK-CLEANING MACHINE.

The Apricot Industry in Damascus.

The city of Damascus is surrounded by gardens which are composed of fields of apricots, furnishing an average yield of from 50,000 to 65,000 quintals of fruit. M. Guillois, the French consul at Damascus, says that the harvest lasts about six weeks, generally from the 10th of June until the end of July. There are six principal descriptions of apricots, the *Sendiani*, *Hamoni*, *Onazari*, *Chahmi*, *Baladi*, and *Klobi*. The *Sendiani* appears the first, about the middle of June. It is an oval fruit of a yellow color and of a slightly acid taste. It is consumed exclusively at Damascus. The kernel of this description of apricot is not bitter to the taste.

The *Hamoni*, which follows immediately after the *Sendiani*, is the most appreciated. It is small, round, with a glossy skin, and the fruit is perfumed and juicy. This variety, like the former, is consumed at Damascus, and it is subdivided into two categories, the *Hamoni bakir* and the *Hamoni lakisse*.

The *Onazari* is slightly oval, red, juicy, and perfumed, and resembles the European apricot. The kernel of this description is large, and of a sweet taste, and is easily detached from the fruit. The price of the *Onazari* is about a sixth higher than that of the preceding varieties, and part of this fruit is consumed at Damascus and the remainder is sent to Beyrout. The three varieties enumerated above are almost entirely used for home consumption, and in a fresh state; while the following descriptions are largely used in the manufacture of preserves, for drying, and for making apricot paste.

These are the *Chahmi*, which externally resembles the *Hamoni*, but is inferior to it as regards taste, the fruit being dry, and wanting in perfume.

The *Baladi*, which resembles the *Onazari* in form and taste, is yet considered to be superior to the latter. The yield of this fruit is about 5,000 quintals, and of this quantity 1,000 quintals are consumed in the fresh state at Damascus, the remainder being used for making dried apricots (*Noukou*) which form one of the principal articles of export from Damascus. This fruit is gathered from the tree when it is completely matured generally about the 15th June. It is then exposed for three days to the sun on planks, covered with a layer of long straw, care being taken to keep the apricots apart, so that they may not touch one another. The third day, each apricot is gently pressed between the palms of the hands, and again exposed to the rays of the sun, and this operation is repeated until the fruit, perfectly dry, assumes the shape of a flattened disk. This usually takes place in about six or eight days, and the apricot loses about 70 per cent of its weight. The price of the dried apricot varies between 30 centimes and 1 franc the kilogramme at the time of drying; but at other times, and particularly in the month of Ramazan, when there is a large consumption of the article, the price is doubled. A small quantity of these dried apricots is used in the manufacture of preserves. The remainder is exported to Egypt, Smyrna, and Constantinople, to a value of about £3,200.

The *Klabi*, which is a very inferior quality of apricot, is a small, dry, red fruit, and is the only one in which the kernel is bitter. It is exclusively used in the preparation of apricot paste. Apricot paste, known as *Kamar el Dine*, is, together with dried apricots, one of the principal exports from Damascus. The fruit, when gathered, is crushed in a kind of large iron wire sieve, and the thick juice which results from this operation is collected in earthen vats, and then spread on planks covered with a layer of oil, where it is allowed to remain two days exposed to the air. At the expiration of this time the paste is removed and turned. On the fourth day the paste is again removed, and it then has the appearance of a band of leather. very thin, and of a reddish-brown color, about a yard and a half long and half a yard wide. This is the finest quality of paste. The same operation is repeated once or twice to obtain a second and third quality, each time a little water being added to the residuum of the former operation. The bands of paste are then folded so as to form bundles of about six pounds weight, which are sold according to quality—from 35 to 55 francs the quintal. In the same way as dried apricots, apricot paste is exported to Egypt, Arabia, Aleppo, Constantinople, and also to Belgium. The value of the export amounts annually to about £14,000.

As regards the kernels of the apricots, part of these is consumed at Damascus in the manufacture of oil, and the remainder is shipped to France, Germany, Italy, and Austria, the value of this export trade being estimated at £8,000. The value of the yield of apricots in Damascus, after allowing for expenses, is estimated at £28,000. These figures, says M. Guillois, are sufficient to show the importance of apricot culture in the immediate environs of Damascus, and in his opinion they might be doubled, if an improved system of culture and irrigation were adopted.

Tests of Rubber Hose.

The tests made recently by the Cleveland Rubber Co., with regard to the best sorts of hose for particular purposes, resulted as follows:

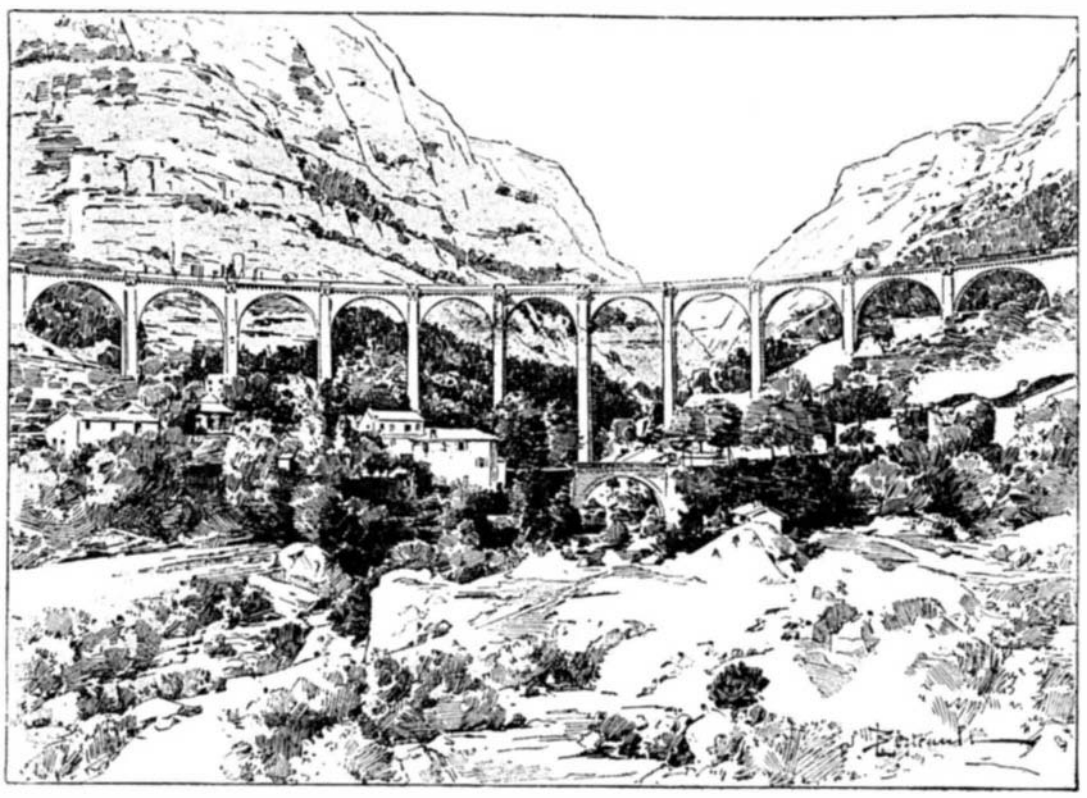
Where a pressure of 25 pounds or less is used, four-ply should be ordered for 1¼ inch and smaller sizes, and five-ply for 1½ inch and larger sizes.

Where a pressure of 60 pounds or less is required, five-ply should be ordered for 1¼ inch and smaller sizes, and six-ply for 1½ inch and larger sizes.

Where the pressure exceeds 60 pounds, add one ply for each additional 10 pounds of steam. Where 90 pounds or more pressure is required, the hose should be duck-covered and wire-bound.

THE VIADUCT DU LOUP.

A new railway line has lately been opened in the South of France, between Nice and Puget Theniers and Grasse, a distance of 62½ miles. It passes through a mountainous and picturesque region, full of lovely sheltered valleys, celebrated for numberless gardens of roses, violets and jasmines, from which the choicest perfumes are made. The new road has been constructed at great expense. A number of tunnels and bridges have been required. We illustrate one of the latter, the viaduct Du Loup, which carries the rails through the valley of the same name.



THE VIADUCT DU LOUP.

This structure is composed of masonry, of eleven arches of about 63 ft. span, built on a curve of about 675 ft. Height, 170 ft.; length, 1,050 ft.

Hop Growing in Bohemia.

The United States consul at Prague, in a recent report, says the large breweries all the world over always keep in their storehouses at least a small quantity of Bohemian hops, although the price paid is frequently a high one. This fact is a high tribute to the excellence of the Bohemian product, the superior qualities of which are attributed to peculiarly favorable conditions of soil and climate, and to careful and well tried methods of culture. Since the sixteenth century hops have had their home in Bohemia, and their fame, then already established, has been maintained and increased, and hop growing still continues to occupy a position of the first importance among the various forms of agriculture. The hop gardens are not extensive, and hop growing is confined to a comparatively small area, while the so-called hop belt is a limited one. The total area under this cultivation amounts, according to the latest statistical returns, to about 26,000 acres, and this is divided into districts known under the names of the cities around which they center. The largest and the best known is the Saatz district, with an area of about 10,000 acres. The neighboring district of Rakonitz, with an area of about 600 acres, produces a grade of hops very similar in quality to that of the Saatz district; then come the Auscha district, with an area of about 4,000 acres, the product of which is not considered as good as the Saatz hops; and the Dauba district, with an area of some 2,500 acres, producing an inferior grade of hops.

The most celebrated of these districts is the Saatz, and the hops grown there are claimed to be the best in the world. The hops of the Saatz district are again subdivided into *Stadt*, *Bezirks*, and *Kreis* classifications, according to quality, and the *Stadt*, or city hops, are the highest grade, while the *Kreis*, or circuit hops, are supposed to be somewhat inferior. In the Saatz and Rakonitz districts the hops are grown under similar conditions, and the products differ very little. The hops grow in a ferruginous, reddish clay soil, along the banks of the River Eger, while the region is protected from the cold north winds by a spur of the Erzgebirge, and the only prevailing winds are from the west and southwest. The elevation is about 800 feet above the sea level, and the mean temperature during the year about 7° Reaumur. The excellent qualities of the hops are ascribed to the peculiar properties of the soil and to the very slight atmospheric depression. The hops of the Saatz, Rakonitz, and Auscha districts are all known under the general name of red hops, while the Dauba hops are called green hops. The distinguishing marks of the Saatz hops are a long flower, closed at the top with innumerable leaflets—from a hundred to a hundred and fifty—which are as soft as velvet to the touch. They are characterized by a delicate spicy aroma, and the bitterness is greatly appreciated. The flower, when ripe, is of a greenish yellow color, with a slight reddish tint. Dauba hops, the type of green hops, have a round flower with fewer leaflets—from forty to sixty—and the odor exhaled somewhat resembles garlic. The color of the ripe flower is of a yellowish green. Red hops form three-fifths and green hops two-fifths of the total crop.

Outside the regions above mentioned, the cultivation is carried on only on a small scale. The average crop in Bohemia is 9,000,000 pounds in round numbers. The average yield per acre is not large; in the Saatz district it is between 350 and 450 pounds, while in the Auscha district, in a good season, there is a yield of 600 pounds to the acre. The labor required for the cultivation is cheap, and hop pickers receive about tenpence for a day's labor. With a view to securing a uniformly higher standard of hop culture there have been established, within the last two years, technical schools for the study of hop culture at Rakonitz and at Laun. These schools receive financial support from the government of Bohemia, and also from the cities and districts where they are located. Being situated in the midst of the hop districts, every opportunity is afforded for practical work. In connection with the Rakonitz school there is an experimental hop garden, where innovations in cultivation are tried. The courses of instruction offered are both for students attending regularly and for farmers desiring special instruction. Among the regular courses of instruction are hop culture, theoretical and practical, from a botanical and practical standpoint, treatment of the soil, choice of the young plants, fastening of the poles, selection of the poles, hop picking, hop sorting, etc. The attendance at the schools has so far been considerable, and many students have come from other countries. The results have been so satisfactory that it is expected that hop culture will show a decided improvement as the schools become older and the students turn the knowledge acquired to practical use.

As an indisputable instance of the material benefit accruing to a sugar estate through the saving of fuel by the use of scientifically arranged furnaces, we are able to-day to refer to Pln. Perseverance, Essequebo, which has just had considerable additions made to its evaporating plant, including a triple effect, and its furnaces placed in order. During the present grinding there has been nothing consumed but green begasse, and all that comes from the mill is not required to supply the demand. Neither wood nor coal is wanted; and the one "coal" boiler that had been left unmodified is not used, and to all appearances is not likely to be. Those who know what the coal account of a sugar estate can amount to during a grinding season will be able to understand the enviable position a proprietor is in who can obtain all the fuel he requires from the *debris* of the canes that are giving him the sugar. At Perseverance the work of remodeling the furnaces was carried through entirely by Mr. Price Abell.—*Argosy.*