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(Illustrated articles are marked with an asterisk.)

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SCIENTIFIC AMERICAN SUPPLEMENT

No. 876.

For the Week Ending October 15, 1892.

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THE COLUMBIAN CELEBRATION OF OCTOBER, 1892.

When this paper reaches our readers, New York will have been the scene of one of the most impressive spectacles it has ever been her fortune to witness. The four hundredth anniversary of the discovery of America by Columbus will have been signalized by parades on land and water, by exhibitions, by decorations of buildings, by meetings of societies and by all the means employed to commemorate great deeds. In a practical age and in the midst of a practical nation, one distinctively of modern times, it is a good sign to see the entire populace alive to the great deeds of preceding centuries. What America lacks is full association with the past. Compared with the European countries, she seems but a modern creation. But in this commemoration of Columbus' work, America asserts her rights in the past, lays claim to an inheritance in the story of the ages which is more valuable than much that Europe can claim.

The story is so picturesque; the departure of the three ships on the ocean, ships which to-day would be deemed unseaworthy, bound, like Hiawatha, "westward, westward;" the weary voyage, the dissensions of the mariners, the encouragement derived from the sea drift which was encountered, the landing at the end of the three months' voyage, is an epitome of all that is best and most courageous in man. In those three months the destiny of a great continent was disposed of, and the history of the world was modified.

America, in the last four centuries, has led the world in many things. In material progress, the increasing rapidity of her development has been without parallel. In old times the civilization of a country was a slow process. The requisite increase of population, the replacing of savage or semi-savage customs by more advanced ones, was a work of time. But here the work, slow at the beginning, has gone on with accelerated speed. Three centuries nearly lapsed before the scattered settlers of the colonies defied and conquered the most powerful nation of Europe. The country for half a century more was lighted at night with candles and whale oil; its mails were transported by stage and horse; its roads were almost impassable in winter; its methods were still of the past.

Within the lifetime of many the new era began. A few experimental railroads, to be operated by horse power, were built. An engine was tried on one of them. The seed germinated, and within a generation the great area is covered with a network of railroads.

Next some scientists begin experimenting with electricity. The entire subject excites but little interest. When Congress is asked for an appropriation, it is but grudgingly granted. The message, "What hath God wrought?" goes down the wire, and, after a few years, the railroads are paralleled with telegraph lines.

There was no question of replacing old established stage or diligence lines with railroads. The carrying of the mails over districts a few hundred miles in extent was not the issue. An area large enough to constitute a continent was to be the scene. The lines were to go through wildernesses and over deserts. The lives of the builders were to be sacrificed to the savage aborigines before the great work could be done. And with all the difficulties the older countries may be fairly allowed to be defeated in the race. Columbus' achievement in its enterprise and daring and in its success was a pledge of the work which has since been done in the land he sailed to.

Looking over the busy scene of enterprise, there are feelings of regret to be mingled with admiration. The civilization of America means the extermination of entire races of mankind. The Northern Indians, human beings, who might have been a most important factor in their own land, have succumbed, and have almost disappeared. Their condition was well within the limits of the savage, yet they were intellectual, and were susceptible of training. The Christian missionaries to Great Britain were moved to effort, it is said, by the sight of British slaves on sale in the markets of Rome. To-day the same race has left its imprint on the entire face of the world, and shows the greatest powers of persistence of almost any people. It would seem that something might have been done with the thousands of Indians whose doom was sealed when Columbus set sail from Spain.

In the south most interesting civilizations have disappeared. Yucatan yields to the explorer ruins that indicate civilization probably as advanced as that of Egypt. The Incas of Peru seem to have been on the same high level. Yet all has disappeared, and Columbus led the way for the Caucasian army, which now holds sway over the entire hemisphere.

The celebration in this city is but a part of a year of celebration, which began last August in Spain and will end at Chicago in the Columbian Exposition. Not the least of the good effects will be the study of the life and times of the great discoverer, and the placing of his character upon a firm and authentic historical basis.

Elsewhere we describe some of the features of the work of the ensuing year and of the reproduction of the ships and of their old-time voyage. The future may see more imposing celebrations, but another century must elapse to give an equally important era.

The Mineral Oil Industry of Scotland.

At a recent meeting of the Federated Institution of Mining Engineers, at Shelton, a paper by Mr. Robert Thomas Moore, on "The Mineral Oil Industry of Scotland," gave a brief notice of the progress and present position of the industry of shale distilling. It included descriptions of the geological and stratigraphical positions of the various seams of shale worked, including the now exhausted Boghead mineral, which yielded 2,337,932 tons in 1891, almost entirely from strata in the lower carboniferous or calciferous sandstone series; the methods of working, the machinery for breaking, and the distilling apparatus for crude oil; the subsequent refining operations being omitted, as being mainly chemical processes. The position of this branch of manufacture, in spite of the constant improvements in the yield from the material by the introduction of more exact methods of working, is, unfortunately, very unsatisfactory from the commercial point of view. Originally burning oil, which was the sole product, sold at 3s. per gallon, and the trade was a very profitable one; but, principally from the competition of natural American and Russian oils, the price has fallen to less than 6d. per gallon; and, although the yield has been supplemented by other products, such as paraffin wax and sulphate of ammonia, the business is not profitable, the price of the raw material and coal having so risen by the increase of 40 to 50 per cent in miners' wages that only a few of the companies have been able to avoid loss in working. The contrast between the original and the present condition of the trade will be seen in the following figures, giving the yield of products per ton of shale treated at the same works. In 1877 they were 30·499 gallons of crude oil and 17·37 pounds of sulphate of ammonia, together worth £1 3s. 2d.; while in 1891, 25·1 gallons of crude oil, 1·73 gallons of naphtha, and 27·23 pounds of sulphate of ammonia only realized 13s. 2d.; the price of the latter having declined from £17 5s. 6d. to £10 7s. 1d. per ton.

Oxyphenine.

This dyestuff makes its appearance in the form of a light yellowish brown powder, which is slightly soluble in cold, but more easily in hot water, to a dirty yellow solution. Alcohol produces a brownish yellow solution; sulphuric acid dissolves it, forming a brownish scarlet solution, which, on diluting with water, turns lemon yellow; hydrochloric acid and caustic soda throw down from aqueous solutions dirty reddish yellow precipitates. Oxyphenine is a direct color dyeing unmordanted cotton from a boiling bath containing soap and salt, going on evenly and easily, 3 per cent giving a deep golden yellow shade, while 1 per cent dyes a fine canary yellow. One merit of the dyestuff is that the dye bath is nearly exhausted, whereas with other yellows of this group much of the coloring matter remains in the bath.

On silk oxyphenine dyes from either a salt or acid bath, giving shades the same as those on cotton; half silk may be dyed in a simple salt bath. Wool may be dyed from either a salt or weak acid bath, but the shades have a more olive tone than those obtained on either cotton or silk. The color is turned a shade redder by strong acids; strong caustic soda has very little action, turning the tint a shade redder, but weak solutions have no action. Soaping has not the slightest action on the color, whether on cotton or wool, so that oxyphenine may be used on goods which have to be milled. Light appears to have little action. Swatches which have been exposed to the sun and air for three weeks show no sign of fading. Oxyphenine may, therefore, be classed among the fastest yellow dyestuffs at the disposal of the dyer. Oxyphenine may be used in calico printing, giving good yellows when printed on with the aid of soda crystals and a starch-gum thickening. A better plan still is to print on a color containing acetate of alumina, acetic acid, and a starch-gum thickening, the color being faster to soaping by this method than with the last. It may be also applied by padding.—*Dyer and Calico Printer.*

THE new twin-screw steamboat Richard Peck, built by the Harlan & Hollingsworth Company, at Wilmington, Del., for the New Haven steamboat line, made 20¼ miles an hour on her trial trip recently. The boat is 316 feet long over all, 48 feet beam over guards, and has a depth of hold of 18½ feet. Her horse power is 4,000 and her gross tonnage is 2,906. She was designed by A. Cary Smith.

UNINFLAMMABLE PETROLEUM.—Numerous processes have figured of late in the patent list whereby it is claimed that petroleum could be rendered inexplosive and also uninflammable. One of these consists in adding to about forty gallons of petroleum two pounds of copper sulphate and stirring the whole well. After about six hours standing the oil is ready for use.

Sixth Edition of Dana's "System of Mineralogy."

The appearance of the successive editions of Prof. Dana's "System of Mineralogy" has been coincident with phases of mineralogical progress, which has made each of them not only symptomatic of a scientific era, but its reflection as well. They have, therefore, illustrated the changing conceptions of the mineralogical mind as a whole, and this cosmopolitan and liberal and practical tone recommended them to the high position they have attained as the *ex cathedra* utterances of the mineralogical faculty. In their *technique*, so to speak, they have shown the most practical and skillful arrangement of details, and their erudition has been equally remarkable and helpful. But they have also assumed the more important function of contributing original views as to the fundamental construction of the science, and this has resulted in a certain grandeur in their breadth of composition and an unmistakable forcefulness and completeness in their assertions. In the words of an English critic, "It is not too much to say that the publication of each successive edition of this work has constituted an epoch in the history of mineralogical science." When we turn back to the edition of the "System" in 1837, and open in succession the subsequent issues, we encounter one of the interesting phases through which all branches of science have passed and which persists in a diminishing degree to-day, viz., the elaboration of its nomenclature. Too much weight cannot be given to a system of nomenclature by which the designations of the separate species are firmly determined, and the terms of their description defined; but the scope and significance of nomenclature is given a deeper importance if we extend its meaning to the classification of species, their grouping, ordinal and family arrangement. Such a problem confronted mineralogists in 1830, and, somewhat dazzled by the unexpected and euphonious results flowing from the binomial system and the groupings of genera, families, orders and classes in botany and zoology, and anxious to confer upon this science the benefits of a device which seemed the apposite reflection in language of the measures and delimitations of nature, they undertook, under the leadership of Mohs, to arrange the mineral species according to a mingled consideration of their physical and chemical composition, and with this system Dana, in 1838, combined a peculiar and original scheme of binomial titles.

Few perhaps of the younger mineralogists and none of its latest students may be familiar with this very bold and independent effort, and the occasion of the appearance of the sixth edition of this great work seems an appropriate time to recall some of its details. It has an indelible interest as associated with the history of the science, and a still greater intellectual interest from the fact that Prof. Dana has gradually eliminated it as a whole, while preserving not only traces but representative parts of its more lucid and scientific features, features always co-ordinated with the chemical properties of minerals.

Prof. Dana, in introducing this "New Mineralogical Nomenclature" before the scientific world, said in his paper before the Lyceum of New York, in March, 1836, alluding to the system of Mohs, which he accepted: "In this arrangement M. Mohs has not wholly relied upon chemical characters, the exclusive adoption of which would have degraded mineralogy from the rank of an independent science, and merged it in that of chemistry; nor has he depended on physical characters solely; for although the latter are more especially employed, the author has throughout been guided to a certain extent by that important source of physical characters, viz., chemical composition. A cabinet arranged according to the system of Mohs presents, with remarkable clearness, a chain of affinities running through the whole, and connecting all the several parts. The *gases* and *liquids*, with which the arrangement commences, are followed by the *salts*, so disposed as to present an increase in stability, hardness, and luster, as the eye proceeds onward. Among the *gems*, we arrive at the diamond, in which these characters reach their climax. Then, descending in the series, we gradually pass through the *metallic oxides* to the *native metals*. In these the light-colored species are followed by the *sulphurets* and *arsenides* of similar color and luster, which are succeeded by the dark-colored metallic sulphurets; and these pass insensibly to the sulphurets without a true metallic luster. From the latter there is a natural transition to *sulphur*, and its close allies the *resins* and *coals*, with which the series terminates."

The minerals or mineralogical elements were grouped under the *Epigœa*, which included the fluids and all soluble minerals whose formation is now going on, the *Entogœa*, embracing those which occur in rock strata, and the *Hypogœa*, or those so deeply embedded in the earth's crust as to justify the appellation of buried. It was in the *Entogœa* that the larger number of the mineral species were placed. The *Epigœa* embraced gases, water, and soluble salts, as borax, alum, common salt, the alkaline salts, and the soluble secondary metallic salts, as copperas, blue and white vitriol, while the *Hypogœa* received the coals, bitumens, oils, etc. These classes were again subdivided into orders, and these again into genera, and each mineral species received a binomial name under its appropriate genus.

A few examples of orders and genera from all these classes will illustrate the system without entering more minutely into details of the method.

In *Epigœa*, or the mineral substances found upon the earth, we find two orders, the *Rheutinea*, or fluids, including two genera, *Aer* and *Aqua*, and the *Sterinea*, or solids, containing the genera *Acidum*, *Borax*, *Alumen*, *Natron*, *Sal*, *Picralum*, *Nitrum*, *Vitriolum*, and *Gœlum*. These genera were separated by considerations based upon chemical composition and upon hardness, gravity, and especially taste, as *weak sweetish alkaline*, *styptic*, *alkaline*, *purely saline*, *saline and bitter*, *cooling and saline*, *astringent and metallic*. The binomial scheme was applied in the following manner:

GENUS PICRALUM.

H.—1 5—2·5. G. 1·4—2·8. *Taste saline and bitter.*

P. glauberi	Glauber's salt.
P. thenardianum	Thenardite.
P. rhombicum	Epsom salt.
P. reussii	Reussite.
P. volcanicum	Mascagnine.
P. vesuvianum	Aphthitalite.
P. octahedrum	Sal ammoniac.
P. deliquescens	Nitrate of magnesia.
P. tenellum	" " lime.

To the *Entogœa* were assigned, separated by hardness, gravity, luster, and streak, some eighty-two genera, and in looking for their determinative elements we find that they may comprehensively be grouped under chemical composition, chemical properties, as fusibility; physical features, as color, cleavage, luster; crystalline form or condition, as crystallized, massive, lamellar, etc.; geological accidents, as place of occurrence, volcanic, etc.; and associations, as granitic, etc. This system not only brought many mineral species into groups whose affinity is unquestioned to-day, and which are retained together, and must be upon any scientific basis of classification, but it also gathered into one genera very discordant neighbors and forced upon essentially distinct minerals a purely arbitrary and fictitious relationship.

Thus, under the order *Hyalinea*, so called from the high glassy luster possessed by its representatives, we find the genus *Hyalus* divided as follows:

H. bicolor	Iolite.
H. acutus	Axinite.
H. rhombohedrus	Quartz.
H. opalinus	Opal.
H. vulcani	Obsidian.
H. sphærulus	Sphærulite.
H. ferriferus	Isopyre.

There was thus produced here a mixture of oxides, sub and uni silicates at the dictation of an extraneous fact, viz., luster; which, however correlated to density or molecular state, failed to express the esoteric principle which, in the philosophy of nature, establishes a truly natural classification in minerals. That esoteric principle was chemical *make-up*, which to-day rules the science and has shed such an abundant light over its dark places as to enlist it among the most finished and most rational sciences of our age. Chemical composition has been found to be the co-ordinating principle which enters most profoundly into all the varied aspects of minerals and binds into certain necessary sequences crystalline form, hardness, luster, and optical characters.

The third class of Dana under this system was the *Hypogœa*, or those so-called buried minerals. In this there were two orders, *Pittinea* and *Anthracinea*. Under the first were gums, bitumens, resins, and under the latter coal and graphite. The recent large extension of the hydrocarbons could not have enjoyed its present comparatively intelligent arrangement if a system of color, translucency, etc., as here adopted, had been retained. Among these organic products, as among the inorganic species, chemistry was alone able to disperse the confusion of discrepant groupings and give to the mineralogist the guidance of her dictum as to their genealogy and kinship.

The affinities of chemical composition was the Ariadne thread which led the mineralogist through the Dædalian labyrinth of mineral species, or perhaps, less strainedly, it was the standard of reference by which they were given their natural positions. To the chemical law Prof. Dana has more and more closely adhered, while he has in this last work advanced along the line of chemical chronology and inspected, in the difficult compounds formerly classed as margarophyllites and in the micas, under the suggestions of Tschermak and Clarke, the perplexing questions of their generation from some fundamental hypothetical molecule.

This chemical plan has separated the aggregate of mineral species into native elements, arsenides, sulphides, antimonides, sulph-arsenides, sulph-antimonides, and other alkaloidal unions, into the oxides, hydrous and anhydrous, the silicates, uni, bi and sub, with later modifications introduced in this sixth edition, the hydrous silicates and the oxygen salts, as carbonates, tantalates, columbates, sulphates, etc., a system practically maintained to-day, with changes more or less material in their succession and interpretation.

In the fifth edition, based upon this plan of chemical reference, Prof. Dana attacked the momentous question of synonymy, and forced upon the science a unifying device of substantive terminations, the classic if not somewhat monotonous *ite*. The review of this section of the subject by Prof. Dana in the fifth edition was very explicit and frank.

When we compare the last, sixth, edition with its immediate predecessor, we find that the science has greatly enlarged its material scope and has also changed some of its points of view. With the growth in the number of species there have been attendant consolidations of species and reference of former species to varieties. There is also shown the evidence of new light or at any rate new conceptions in the treatment of the silicates, and, to a large degree, the groupings have been rearranged, while the succession or sequence of groups and divisions has been extensively altered. The fundamental plan of the fifth edition has been adhered to, and it would be difficult to devise a method and typographical treatment more expressive and convenient.

In the place of the bi, mono and sub silicates with the hydrous silicates, more or less hypothetically separated under these three sections, we have the di, poly, meta, ortho and sub silicates. The disilicates are salts of disilicic acid, $H_2Si_2O_5$, and have an oxygen ratio of silicon to bases of 4:1, and are represented by *petalite*; the polysilicates are salts of polysilicic acid, $H_4Si_3O_8$, and have an oxygen ratio of 3:1, and are represented by the feldspars; the metasilicates are salts of metasilicic acid, H_2SiO_3, and have an oxygen ratio of 2:1, and are represented by *pyroxene* and *amphibole*; the orthosilicates are salts of orthosilicic acid, H_4SiO_4, having an oxygen ratio of 1:1, of which the garnets are representative; and, lastly, the sub-silicates, in which the oxygen of the bases exceeds that of the silicic acid. The system has many exceptions, and seems hardly to introduce any chemical conceptions or aid in the realization of the facts of nature more clearly than the old method, which regarded the excess of silica (as would be the case in the di and poly silicates of this system) as unsaturated acid of the ordinary type.

The species *titanite*, *keilhanite*, *guariuite*, *astrophyllite* and *perofskite* are considered titano-silicates, and are placed at the end of the silicates, between which and the niobates, tantalates, etc., they form an interconnecting link or at least are regarded as doing so. The carbonates precede the silicates, and quartz, which formerly ended the oxides, now, by a natural precedence, leads the list. A few substituted names or combined species for older ones strike the eye. Naselite replaces nasite, raimondite covers apatelite, lazurite replaces lapis lazuli, pinite is added to muscovite, tennantite is combined with tetrahedrite, salite takes the place of salilite, bastite or Schiller spar is put under hypersthene, iadeite receives a mnch fuller treatment, klipsteinite is put under rhodonite, kupfferite under anthaphyllite, gieseckite under nephelite, as a long-supposed alteration product of that species. The investigation of Klein into the double refraction of garnets is incorporated, and the optical anomalies of other species, as explained by this author, also noted. Humite is separated from chondrodite, with a new species, clinohumite (1876). These three species are discussed together. Phlogopite is appended to biotite and also lepidomelane. The treatment of columbite is much expanded. Gummite and uraninite are placed under the uranates. The so-called perofskite of Magnet Cone, Arkansas, is made a titano-niobate of calcium and iron and placed under the name dyslanotite.

The crystallographic part of the system has been extensively revised. Nearly all of the 1,400 figures are either newly drawn or are new drawings of old figures, the angles of fundamental forms have been traced to the original authorities, and from them the axes have been determined by calculation, and the angles recalculated of the more important and common forms. The numerous interpolations of new species has displaced the old species from their numeral position, as well as their rearrangement. The vast amount of mineralogical investigation which has accumulated in recent years has been examined, and its substantial and permanent results given.

The sixth edition of Dana's "System of Mineralogy" places the science of minerals in a unique position, for it furnishes the student with a text book which is practically a complete repository of all that the science contains.

L. P. G.

Horse Power of Locomotives.

According to the *Railroad Gazette*, there are many cases in which 1,000 horse power and more has been exerted by locomotives. Indicator cars of Strong locomotive 444, drawing a 370 ton train at a speed of nearly 60 miles an hour, show the horse power to have been from 1,369 horse power up to 1,810 horse power. Cylinders, 20 × 24 inches; 62 inch driving wheels. Weight, 138,000 pounds, of which 90,000 pounds on driving wheels. Piston speed, 1,304 feet per minute. It is believed this power has not been exceeded.

Printing of Woolen Tissues.

Of late years the printing of woolen tissues has developed to a very great extent and has become a by no means inconsiderable branch of the textile printer's art. Consequently printers are giving much attention to it, and the printed tissues have become favorites with the ladies, who, after all, exercise a considerable influence, by creating the demand for certain textile fabrics, in developing the production of those fabrics.

There is no doubt that the great development which has of recent years taken place in the production of coal-tar colors and the many brilliant and fast dyestuffs now at the disposal of dyers and printers have contributed much toward the increased attention which has been paid to woolen printing. The woolen printer is enabled by their means to produce his effect with great ease, and with successful results, and in these respects the coal-tar colors offer superior advantages to the older natural dyestuffs. The use of these in printing presented many difficulties, and only a limited number of colors and shades could be produced by their means.

It is now customary to prepare woolen cloths which are intended to be printed on by a passage through a bath made with bleaching powder and hydrochloric acid. Dyes printed on cloth thus prepared with chlorine give colors which are much more intense and are faster than if printed on unprepared cloth. Still, although the colors obtainable on chlorine-prepared woolen tissues possess a sufficient degree of brilliancy, deft, and fastness, there are other points in connection with the prepared cloth which are not so satisfactory; thus the cloth may take a yellow tone and a harsh, unpleasant feel, and often is rather brittle. All these things are undesirable, and are no doubt due to an over-oxidation of the woolen fiber, which is not always easy to prevent. In a paper lately communicated to the Society of Dyers and Colorists, Mr. E. Lodge has shown that, by a careful regulation of the strength of the chlorine baths, this over-oxidation of the woolen fiber may be avoided and the cloth left white and comparatively soft, although its attraction for coloring matters is not less than in over-oxidized woolen cloth.

Mullerus has lately suggested another principle. One defect of the chlorine method is the harshness which is imparted to the woolen cloth. Now printing can be considered simply as localized dyeing, and as the color is thus produced in places on the tissue, Mullerus considered that the oxidation of the fiber might also be produced locally and in the places where required by the design printed on the tissue. To carry out this idea he mixes the ordinary printing color with oxidizing agents like chlorate of soda, barium peroxide, etc., with excellent results so far as regards brilliance, intensity, and fastness of color, while the harshness of the fabric is prevented.—*Dyer and Calico Printer.*

Disinfection by Means of Sulphur.

We do not think that sufficient publicity has ever been given to the remarkable experiment made at Detroit, during a severe epidemic of diphtheria and scarlet fever, in checking the spread of the disease by disinfecting the sewers with sulphur, tons of which were burned in them. The experiment seems to have been signally successful. Of course, it would be rash to infer, from a single trial, the causal connection of things which may possibly have been simply coincident; but it is certain that as soon as the sewers had been saturated with the fumes of the burning sulphur, the epidemic declined rapidly, and both diphtheria and scarlet fever soon disappeared. The probability that cholera will make its appearance next summer in at least some of our large cities suggests the propriety of adopting this simple and inexpensive precaution, in case of the introduction of the epidemic into any sewered town. Every one knows that the fumes of burning sulphur form the most potent of disinfectants, and cholera would, in our cities, probably spread more rapidly through the sewers than in any other way. It will be remembered that at Croydon, after the introduction of sewers, typhoid fever, which had previously been endemic in the lower parts of the town, but was almost unknown in the upper regions, inhabited by the rich and well cared for people, suddenly appeared in an alarming form in the upper quarters, as if the new sewers had conducted the contagion from the abodes of filthy misery to those of wealth and cleanliness. The same thing may be expected to happen with cholera germs, which, if once introduced into the sewers, would, if they will float in the air when dried, which seems to be the case, have plenty of opportunities to escape through street ventilators, dry traps and leaky soil pipes, all over the city. The saturation of the sewers at short intervals with sulphur vapor would destroy the germs contained in them, and, it would seem, do much to localize any sporadic case, or group of cases, while no harm could be done by the operation. Indeed, the principal homeopathic prophylactic against Asiatic cholera is sulphur; so that the inhalation of a few stray fumes, although perhaps unpleasant, ought to make the person into whose nose they accidentally penetrated feel himself doubly protected.—*Amer. Architect.*

A FAN ATTACHMENT FOR ROCKING CHAIRS.

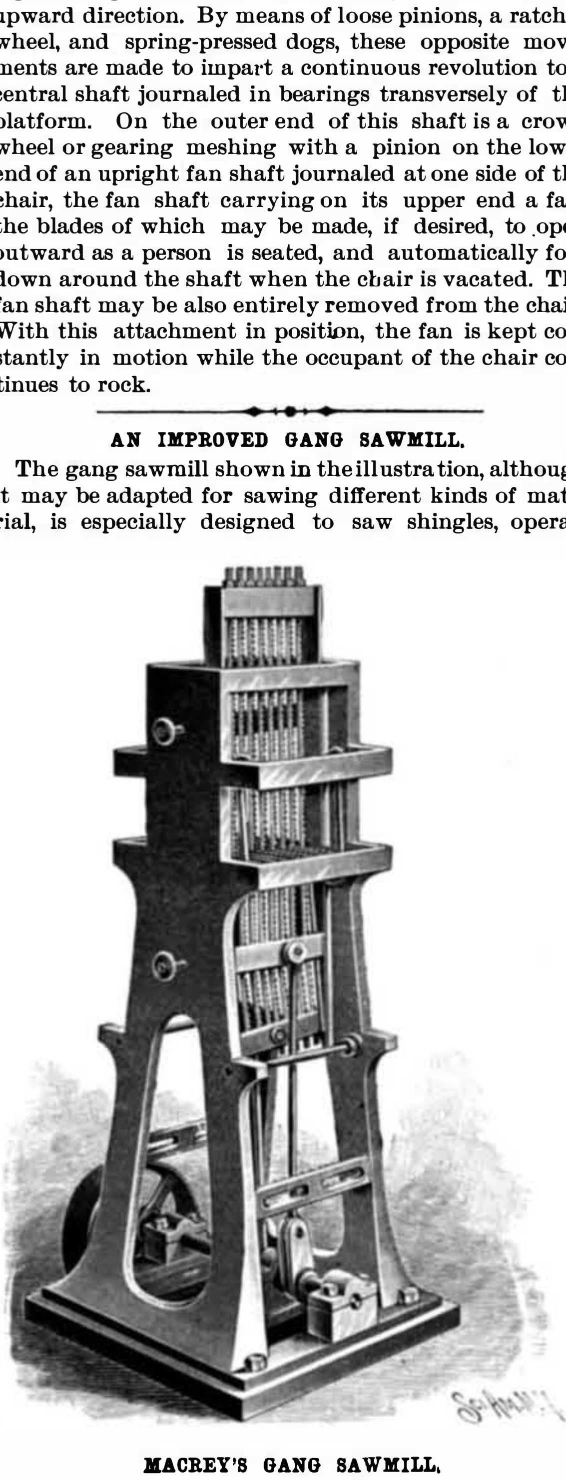
This is a device to be applied to a platform rocker, and, as one rocks backward and forward, a continuous rotary movement will be imparted to a fan held above the occupant of the chair, affording a constant and refreshing current of air. The improvement has been patented by Mr. Horace M. Baker, of No. 203 Macon Street, Carthage, Mo. The larger view shows the application of the attachment to a chair, parts of which are broken away, while the smaller view represents the details of the mechanism. At the back of the platform is

BAKER'S ROCKING CHAIR FAN.

the drive shaft, a crank arm on which is adjustably connected with a pitman whose upper end is pivoted on the back of the chair. On the drive shaft are also two other crank arms extending in opposite directions, each being connected by a rod with the crank arm of a different segmental gear on another shaft, so that, when one segmental gear is rotated downward, the other has an upward direction. By means of loose pinions, a ratchet wheel, and spring-pressed dogs, these opposite movements are made to impart a continuous revolution to a central shaft journaled in bearings transversely of the platform. On the outer end of this shaft is a crown wheel or gearing meshing with a pinion on the lower end of an upright fan shaft journaled at one side of the chair, the fan shaft carrying on its upper end a fan, the blades of which may be made, if desired, to open outward as a person is seated, and automatically fold down around the shaft when the chair is vacated. The fan shaft may be also entirely removed from the chair. With this attachment in position, the fan is kept constantly in motion while the occupant of the chair continues to rock.

AN IMPROVED GANG SAWMILL.

The gang sawmill shown in the illustration, although it may be adapted for sawing different kinds of material, is especially designed to saw shingles, operat-



MACREY'S GANG SAWMILL.

ing two gangs of saws in such a way as to saw up an entire bolt at one operation, without waste of stuff, the saw gangs being independently adjustable in relation to each other to give the desired pitch or bevel to the shingles. The improvement is the invention of Mr. William T. MacRey, of Vancouver, British Columbia. Each frame, with its gang of saws, is reciprocated in the standard by a pitman, connected with a crank on the driving shaft, the frames being arranged in their guides so that the wear may be readily taken up. One saw frame slides vertically in the standard, and just behind it the other saw frame slides in inclined guides, so that its saws will be at a slight angle to those in the first frame, the guide frame being quickly and accurately adjusted by the set screws projecting through the sides of the standard. In operation, one frame goes up while the other goes down, the vertical saws cutting the bolt into straight strips and the oblique saws then cutting these straight pieces to the desired pitch or bevel. At a convenient height for the insertion of the bolts to be sawed the standard has projecting portions, one above the other, which form supports for upper and lower feed bars, adapted to move back and forth at right angles to the saw frames. These feed bars have teeth in their faces to engage the bolt, and move toward each other to clamp it in place, reciprocating to feed the bolt through the machine, the lower feed bars being lifted upward and thrown forward, while the upper ones are thrown downward and forward. The inclined guides may be arranged vertically if desired, so that the bolt may be sawed into staves of uniform thickness. It is said that this sawmill, cutting shingles, will cut from three hundred to four hundred thousand per day of ten hours.

This improved mill is being placed on the market by the MacRey Patent Gang Mill Co., of Vancouver, Toronto, and Buffalo.

Rubbers.

I know it is the custom and the habit to sneer at rubbers. It is the custom and the habit to say: "Why don't you give us something that is good for something?" We give you, gentlemen, just what you called for. I will guarantee that in my mail (and we average perhaps a hundred letters a day) there is not one letter out of 5,000 which says: "What is the best thing you have got?" but it says: "What is the cheapest thing you have got?" Now, when you ask for the cheapest thing, we are going to give you lampblack and whiting and resin, and everything else that will make the goods cheap. When you turn around and say: "Give us good rubbers that will pull and stretch and hold," and pay for them, we will give them to you; and we won't give them to you until you do ask for them.

We are glad to see you gentlemen here as representatives of the trade. No gentlemen can get together in any one line of trade and rub their heads and ideas together without imparting knowledge to one another. We take more in by absorption than by reading and study.

I want to say to you, gentlemen of the national association, that if you never accomplish another thing, the fact of your establishing what is recognized throughout the United States, and almost throughout the world, the standard measurements, is a monument to your enterprise and your energy. There is not a manufacturer now that goes to work to make shoes but what consults that standard. It is the standard. There is no standard among us rubber fellows. I expect you will go for us next. But that is a very difficult thing to accomplish, more difficult than you have any idea of. You sell a woman a pair of shoes, 4 D, and you think a 4½ rubber ought to fit her. Perhaps it will and perhaps it won't. If it is a grain button boot, it won't fit. If it is a square edge, it won't fit; if it is a bevel edge, it will. Then you want to recollect that the lasts upon which the rubbers are made are put into a heater. They are all supposed to be made out of upland maple. Well, these dear countrymen get the maple out for us, and sometimes we find a good deal of swamp maple in it. That is put into a heater, 268° F. The heat will affect one piece of wood in one way and another piece in another.—*W. L. Sage.*

Storage Battery Monopoly.

After a struggle lasting for about ten years, beginning in the Patent Office and carried successively through the United States Circuit Courts in several States, the United States Circuit Court of Appeals on the 4th inst. handed down a decision sustaining the decree of Judge Coxe rendered in July, 1891, in the suit of the Brush Company against the Electrical Accumulator Company. The sole right to use storage batteries with the active matter mechanically applied is now owned by the Consolidated Electric Storage Company, the licensees of the Brush Electric Company. Consequently, this decision gives to the Consolidated Electric Storage Company a monopoly of the storage battery business throughout the United States for a period of over ten years next ensuing.