

RECENTLY PATENTED INVENTIONS.

Of Interest to Farmers.

CHOPPER.—M. S. SOBER, McLOUD, Oklahoma Ter. The object of the invention is to provide a new and improved chopper more especially designed for use in cotton-fields, but also useful in corn-fields, rice cultivation, and the like and arranged to permit convenient chopping, cultivating, and thinning of rows in the fields and whipping caterpillars and other insects from the plants without injury to the latter.

CURRENT-MOTOR.—G. SAMUELSON, Sandpoint, Idaho. This invention relates to improvements in motors designed to be placed in a river or other body of water in which there is a current, the object being to provide a current-motor of simple and novel construction that may be utilized for pumping water for irrigating purposes and may be also utilized for operating machinery.

Of General Interest.

TRUNK.—M. B. BEHRMAN, Baltimore, Md. The invention is an improvement in packing-cases—such as trunks, dress-suit cases, shipping cases, delivery-cases such as merchant tailors use to deliver clothing, and similar cases; and the invention has for one of its objects, to provide a construction by which clothing may be held from movement in the case and may be preserved in the position in which it is placed in the case, so that it will not move about and become wrinkled and otherwise deranged.

BUCKLE.—C. L. HASTINGS, Fond du Lac, Wis. Mr. Hastings' invention relates to buckles for use in attaching straps or other flat connecting devices of any kind to each other. One object of his invention is to secure greater holding force in articles of this character than has been attained in previous constructions. The transversely extending cross-bar has a projection which causes a more pronounced pressure upon the strap placed upon it than in the case when this bar is entirely within the surface of the buckle, and thereby prevents slipping of the straps.

Hardware and Tools.

MITER-BOX.—A. VON GUNTEN, St. Charles, Mo. In Mr. Von Gunten's patent the invention has reference to miter-boxes of that particular form in which the saw-frame swings about a vertical axis and also tilts about a horizontal axis to permit the saw to stand in a plane inclined to the vertical.

WRENCH.—F. W. McNABB, Parry Sound, Canada. This improvement relates to a wrench capable of many uses, but especially adapted for use on pipes and the like, its main objects being to secure a maximum efficiency in devices of this character without increasing the cost or causing any undesirable complication. Other objects are to prevent slipping of the instrument and injury to the pipes or other articles on which it is used and to provide for wide adjustments and the like.

TOOL-HOLDER.—H. LANGER and G. BOCK, Steglitz, near Berlin, Germany. The invention of Messrs. Langer and Bock has reference to a new tool-holder especially adapted to be used in connection with lathes. An essential feature of the invention consists in the special construction of the locking device, another feature of the invention being the arrangement of the cutting-tool.

Machines and Mechanical Devices.

MATCH-BOX.—E. C. CARRIS, Washington, Iowa. This invention refers to match-boxes that are adapted to supply a single match at a time for removal from the box. The novel feature consists in the provision of deep notches in the lower end of the tray-board, thus forming a resilient central tongue-piece thereon, upon which the matches rest and are individually presented to a pair of fingers for transfer toward the point of arrest for the match; and springs are provided for rocking the shafts and moving the pusher-arms into the cylinder. It is an improvement on a former patent granted to Mr. Carris.

Pertaining to Vehicles.

DRAFT ATTACHMENT FOR VEHICLES.—G. H. KLUGEL, Thieman, Minn. This invention relates to an attachment, which may be applied to any kind of a vehicle but is especially adapted to two-horse wagons and the like. The principal object is to provide means for preventing the jar and swinging of the tongue which occurs when one of the wheels meets an obstruction or is raised for any reason. An important feature is the provision of means for permitting the front axle to be swung upon its pivot and also to be swung vertically without bringing most of the strain upon one of the draft animals and also for equalizing the strain upon the animals when one tends to take a larger part of the load.

Designs.

DESIGN FOR A WALL-COVERING.—T. CLEARY, Schuylerville, N. Y. In this ornamental design for wall-coverings, a solid ground color gives a peculiar diversified effect by reason of irregular wiped patches.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of the paper.

\$1,200 a Year For Life

SECURED BY SMALL MONTHLY PAYMENTS

The scientific cultivation of crude rubber is the most profitable enterprise of modern times. Because the price of rubber doubled in a decade and the total extinction of the virgin rubber trees of the world became a certainty for the near future, the greatest horticulturists in America and Europe have given their attention to the cultivation on scientific principles of this great necessity of present day civilization. The semi-tropical regions of Mexico were selected for the purpose. There the virgin rubber trees have been ruthlessly destroyed by the improvident natives, and the white men who employed them saw no necessity of preserving the trees for annual tapping, as their number seemed inexhaustible. In that climate the rubber tree can be cultivated just as simply and just as surely as the sugar maple can be grown in Vermont, and can be tapped year after year at an immense profit. The destruction of the virgin tree still goes on in the South American jungles, where the natives are now forced to seek them at an added outlay of time and money, and where no white man can live to restrain them. The present inadequate supply of crude rubber comes almost entirely from this precarious source. It is inconceivable that the production of one of the great necessities of mankind can longer remain in such ignorant hands.

There is nothing speculative about Crude Rubber. It can be sold every day in the year, in every market in the world, and at a stable price that has been steadily advancing for many years.

The Mutual Rubber Production Company was one of the first to engage in this new and immensely profitable industry on a large scale. Years ago our managers purchased from the Mexican Government over 6,000 acres of land in the heart of Chiapas, the most tropical and fertile State of Mexico. No similar tract is available to-day for less than five times what we paid for ours. Thus the remarkable opportunity is now open to you to secure an interest upon the most favorable terms, in an enterprise that is destined to revolutionize the production of one of the world's greatest staples. No industry ever underwent so radical a development as that in which we are now engaged without making immensely wealthy all those who were interested in the change.

This splendid domain is now fast becoming a great commercial rubber orchard, conducted upon the most scientific principles of modern forestry and under Anglo-Saxon supervision. There are 6,000 shares, each share representing an undivided interest equivalent to an acre of land, planted to rubber trees and brought into bearing, and the price of these shares is \$288 each. No large cash-down payment is required to secure them, however, as the shares are paid for in small monthly installments just as the work of development progresses. Thus the man or woman who wishes to secure a safe and certain income for future years, and who is able to save now a few dollars each month, is on the same footing in rubber cultivation as the mightiest capitalist, for wealth alone cannot force the soil.

For example, suppose you buy five shares (equivalent to five acres). You pay \$20 a month for twelve months, then \$15 a month for twelve more months, then \$10 a month for a limited period until you have paid the full price for your five shares, \$1,440—or \$288 per share.

But meantime your dividends will have amounted to \$1,050, or \$210 per share. Hence the actual net cost of your five shares, or acres, is \$390, or \$78 each. We secure these early dividends by planting 600 trees to each acre, and then "tap to death" 400 of them before maturity, getting every ounce of "rubber milk" from them. The dividends secured from the sale of this rubber are sufficient to pay your total money nearly all back before maturity, and then there will be left standing upon each acre 200 trees; and this is the normal number for the permanent yield. These 200 trees will each give at least two pounds of crude rubber per year for more years than you can possibly live. This rubber at 60 cents per pound net profit means a total profit of \$240 a year on each acre, or \$1,200 a year on your five acres. These figures are not "paper estimates" and they are not ours. They are vouched for by the most reliable sources of information in the world, the Government reports of the United States and Great Britain. Of course if you buy 10 shares your income would be \$2,400 a year; or 25 shares will yield you \$6,000 annually.

Five Acres, or Shares, in our Rubber Orchard planted to 1,000 Rubber Trees will at maturity yield you a sure and certain income of \$100 a month for fifty or more years, and your dividends will average 25 per cent. during the period of small monthly payments.

Every possible safeguard surrounds this investment. The State Street Trust Company of Boston holds the title to our property in Mexico as trustee. We agree to deposit with them the money paid in for shares, and we file with them sworn statements as to the development of the property. This company also acts as registrar of our stock. You are fully protected from loss in case of death or in case of lapse of payments, and we grant you a suspension of payments for 90 days any time you may wish. Furthermore, we agree to loan you money on your shares.

We can prove to you that five shares in this safe and permanent investment, paid for in small monthly installments, will not only bring you an average return of 25 per cent. on your money during the period of payment, but will then bring you \$100 a month for more than a life time. Send us at once \$20 as the first monthly payment to secure five shares, \$40 for ten shares, \$100 for twenty-five shares—\$4 per share for as many shares as you wish to secure. Our literature explains our plan fully and concisely and proves every statement. It will be sent to you immediately on request.

Mutual Rubber Production Co.
88 Milk Street, Boston, Mass.



HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

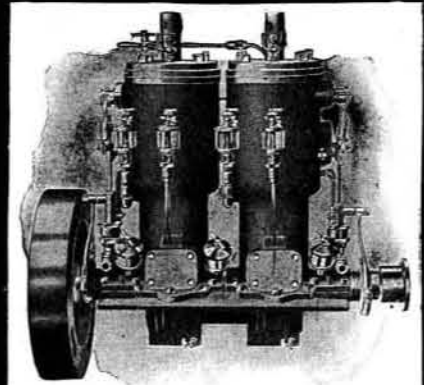
(9524) N. L. asks: What causes the sparks between the trolley wire and trolley of an electric car in motion, also the sparks which occur sometimes between the wheels and rails? A. A spark occurs whenever there is an air gap between the trolley wire and the trolley, or between the wheel and the rail. A little gravel on the rail will produce the latter as the wheel strikes it, and a jarring will cause the trolley to leave the wire. 2. Please give the colors in succession that show upon steel in tempering, from the lowest to the highest temper. A. The colors upon steel vary from deep blue up to a high straw color. The blues indicate low, and the straw colors indicate a high temper. The tempering is an individual matter which cannot be taught by a book. 3. Is the United States superior to all other countries in mechanics? If not, what country ranks first, as a whole? A. We think that mechanics in the United States are among the most skillful of any in the world. 4. Do either the inside or outside wheels of a railway car slip in going around a curve? If not, how is this difficulty overcome? A. Both the inside and the outside wheels may slip in going around a curve. 5. In your estimation, in what field are the opportunities better—mechanical or electrical engineering? A. Both mechanical and electrical engineering are good fields for any young man. Each one should follow his preferences. Every one who would enter either profession nowadays should be highly educated. Both mechanical and electrical engineers pursue very nearly the same studies at first, and toward the last of the course take different work. An electrical engineer may soon learn mechanical engineering, and vice versa. 6. Is it a fact that 99 per cent of the energy in a ton of coal is lost in transforming that energy into incandescent electric lights, that is to say, is only one per cent of the energy utilized in electric lighting when coal is used as the source of energy? A. It is not true that 99 per cent of the energy of the coal is lost in transforming it into incandescent electrical light. In small steam plants 85 per cent may be lost, and in the large powers, where 1½ pounds of coal produce one horse-power, the loss drops to near 80 per cent of the coal value.

(9525) W. A. G. asks: 1. Kindly show a circuit of three or more gas jets as wired for electric gas lighting. A. To light three gas jets with one coil, and at the same time run the circuit of the secondary coil through each gas burner, connect to the wires of the igniter on the jet, and carry the circuit back to the coil again. This will make a complete circuit from one pole of the secondary around to the other pole. Connect the battery to the primary of the coil, and the switch. This makes another circuit complete. On closing the switch, a series of sparks will be thrown across the gaps at the burners, if the work has been properly done. 2. How should a Ruhmkorff induction coil be connected to the circuit—the primary or secondary being used, or both? A. The battery and switch are in the primary circuit of the coil. The igniters in the secondary circuit. 3. Is there any danger in the wiring, except where it is near the gas pipes? A. There is no danger except where a spark is produced. 4. Are there any liabilities from fire due to the high current? A. There should be no fire set by a battery current. 5. Do the batteries have to be switched in, or is it not necessary? A. The battery is brought into action by closing the switch. At other times it is not in action.

(9526) D. M. asks: To decide a dispute, will you kindly answer which is correct, A or B? A holds that the electric current which runs a trolley car passes through the motor, thence by the wheels to the rails and is then diffused, and that it does not have to go back to the power house by either the rails or the earth. B holds that it goes back to the power house by the rails or the earth, thereby making a complete circuit. A. The theory accepted at present is that the electric current, after passing from the overhead trolley through the motor and the wheels to the rails, is by the bonds of the rails and the rails themselves conveyed back to the dynamo, which is connected by a metallic circuit to the rails for that purpose. There is some

SMALLEY

MARINE GAS ENGINES

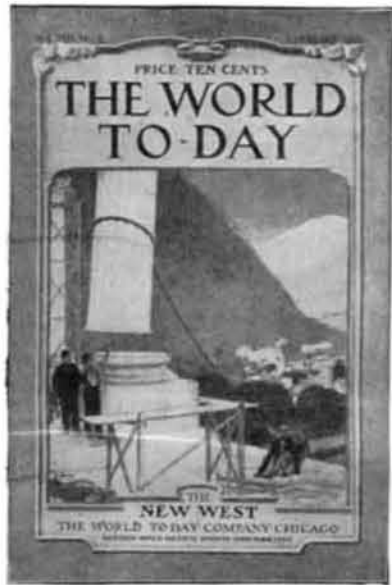


POWER FOR YOUR BOAT

SMALLEY marine engines are recognized as standard the world over. A wise man will not attempt to save a few dollars by purchasing questionable goods. Our machine is worth far more to you than we ask you to pay. You get absolute satisfaction and the benefit of the latest practical improvements—not fads. You get the benefit of our long experience in building marine gas engines exclusively. You have the satisfaction of knowing that you are dealing with responsible parties whose guarantee means something. Our 84 page handsomely illustrated 1905 catalogue will be sent on receipt of 10 cents in postage. See our exhibit at Motor Boat Show at Madison Square Garden, New York. Address Dept. W.

SMALLEY MOTOR CO., LTD., Bay City, Mich., U. S. A.
Member of the National Ass'n of Engine and Boat Mfrs.

The World To-Day



For February is Devoted Largely to the "New West"

It is not a "write-up," but gives an intelligent, sympathetic interpretation of the significance and spirit of the West—the West born since 1890. It emphasizes what is distinctive in the Western empire which has developed in such a wonderful manner during the last few years. Articles are by well-known writers and handsomely illustrated—many illustrations in colors. If interested in the "New West" read:

- "The Outposts of Empire"
- "In the Land of Sunshine"
- "The Capital of the New West"
- "Culture in the New West"
- "The Conquest of the Mountains"
- "The Westerner"
- "Where is the West?"

In the February issue is also

The Mormon Endowment Ceremony

The full text of the Secret Rites and Oaths of the Mormon Temple

The case of Senator Smoot gives importance to this remarkable exposé of the Initiation Ceremonies. It comes from a reliable source and should be read by everyone wishing to understand the true spirit of the Mormon Church.

Ten Cents a Copy. \$1.00 a Year.
At all dealers or send direct

THE WORLD TO-DAY,
67 Wabash Ave., Chicago

Enclosed find \$1.00 for which please send THE WORLD TO-DAY for one year, commencing with the _____ issue.

leakage to the earth, but this stray current ultimately finds its way to the dynamo with the rest. When an underground trolley is used, there is no return by the rails. Two conductors are placed in the conduits, and a double trolley is used. B's view is the accepted one. The suggestion has recently been made that the current is dissipated to the earth, and does not go back to the dynamo, the earth serving as a return in the same manner as in the telegraph, but this has received little attention. The electrolysis of pipes between the rails and the dynamo is against this view.

(9527) E. H. L. asks: 1. Who was the first man to run an electric motor from a dynamo? A. The discovery of the fact that a dynamo would by its current drive another similar machine as a motor is ascribed to Gramme, the inventor of the Gramme ring armature. It is said to have been an accidental discovery. Mr. Tesla invented the rotary magnetic field, by means of which the rotation of the polarity of the magnet poles drags after them the armature in the alternating current system. It was a most valuable discovery. 2. Having a line of shafting on a ground floor used to run agitators, which is the most economical—to run direct with belt from an engine, or to use motors and a dynamo? A. The most recent practice is to run each machine by its own motor, instead of driving from a line of shafting, belting to the separate machines. Its economy is due to the saving of the power required to drive a line of shafting, and the stopping of the power by shutting off the current from the motor the instant the work is done. There is little or no waste of power by this method of driving.

NEW BOOKS, ETC.

STEAM BOILERS. Their Theory and Design. By H. De B. Parsons, B.S., M.E. New York: Longmans, Green & Co., 1903. 8vo.; pp. 375; illustrated. Price, \$4.

Students in this branch of practical science will here find, brought together in one volume, much information indispensable to the designing of steam boilers. The author makes no claim of originality, save in the effort to cover those perplexing points constantly confronting the student in practical work. Mr. Parsons's position in the engineering world should be sufficient guarantee of the value of the book.

MODEL STEAM TURBINES. How to Design and Build Them. By H. H. Harrison. London: Percival Marshall & Co., N. D.; 16mo.; pp. 85. Price, 20 cents.

A small experimental turbine is a departure for the model maker, and offers him an admirable scope for his powers. The present volume is thoroughly practical, and will prove of very timely interest.

TYPES AND DETAILS OF BRIDGE CONSTRUCTION. By Frank W. Skinner. New York: McGraw Publishing Company, 1904. 8vo.; pp. 289. Price, \$3.

This book forms an epitome of modern American bridge construction. All types of arched bridges are thoroughly illustrated and described, the essential features of construction being clearly brought out in every case. Not only American, but also the best characteristic types of foreign bridges are described. Besides plans and specifications of the bridges as a whole and their details of construction, the book contains numerous half-tone illustrations, showing the completed bridges and the methods used in their construction.

THE ANATOMY OF THE AUTOMOBILE. By A. L. Dyke. St. Louis: A. L. Dyke Automobile Supply Company, 1904. 8vo.; pp. 727; numerous illustrations. Price, \$2.50.

This book gives instructions for the care and maintenance of most of the leading American automobiles and a number of foreign cars as well. In most instances detailed descriptions of the automobiles, illustrated by lettered and numbered diagrams, give the reader a good insight into their construction; while this knowledge is supplemented by useful hints concerning the care and operation of the machine. In the case of the foreign cars, the descriptions published have been taken largely from the Automobile Review and the SCIENTIFIC AMERICAN SUPPLEMENT. Besides the description of automobiles, several articles on storage batteries, automobile construction, and the like, add to the value of the book. Its up-to-date character will be realized from the fact that a considerable number of the airships and kites which competed at the St. Louis Exposition are illustrated in the last chapter of the book. On the whole, this book is one of the most complete instruction books that have thus far been published.

BIRDS ON LAND AND SEA. A Record of a Year's Work with Field Glass and Camera. By John Maclair Boraston. Illustrated by photographs taken direct from nature by the author. New York: John Lane, the Bodley Head, 1905. 12mo.; pp. 282. Price, \$2.

Mr. Boraston's book, besides giving evidence of careful observation on his part, has the

HAYNES

EVERY INCH— AN INCH OF HONEST CONSTRUCTION

The HAYNES is the car for pleasure—the car for value.

If paid double the price we couldn't buy better material than we use, nor employ more skilled labor—hence the Haynes Honesty is unquestioned, the Haynes Value unexcelled.

Quite important points in car buying because you don't buy a car every year; therefore when you buy, buy a good car—buy a HAYNES

PRICES

35-40 H. P. 4-cylinder (vertical in front), Roller Bearings throughout, almost noiseless engine, has a new and decidedly effective silent Roller Gear Shaft Drive, seats five passengers, double side entrance tonneau, . . . \$3,000
Victoria or Folding Extension Top, \$200 extra.

16-18 H. P. 2-cylinder (opposed), Four-Passenger Convertible Light, Double Side Entrance Tonneau Shaft driven direct on high speed. Runs as quietly as an electric, \$1,500

16-18 H. P. 2-cylinder (opposed) Two-Passenger Touring Car, with folding front seat equipped with folding top. Engine fitted with mechanically operated inlet valves and is almost noiseless, \$1,350

Regular Haynes Three Speeds Forward and Reverse Controlled by one Lever used in all models.

Our catalog describes the Haynes Handsome Line and is interesting, instructive and invaluable to prospective purchasers. You should write for it if you're seeking information worth having

THE HAYNES-APPERSON COMPANY
NEW YORK KOKOMO, INDIANA CHICAGO
Member Association Licensed Automobile Manufacturers

The Only Sure Auto Tire



We have proven this to thousands and can prove it to you.

It is solid rubber, will fit standard clincher rims, is built on lines so as to be as resilient as a well-inflated pneumatic.

Write for 1905 booklet which contains price list and testimonials.

The Swinehart Clincher Tire & Rubber Co.

AKRON, OHIO.

Branches
NEW YORK, 1773 Broadway. LOS ANGELES, CAL., 651 Sanpedro St. ST. LOUIS, MO., 830 S. 18th St.
OAKLAND, CAL., 315 8th St. PHILADELPHIA, PA., 514 N. Broad St. MINNEAPOLIS, MINN., 411 5th Av. So.

TIRE MAINTENANCE

DEFLATED

INFLATED

No "Creeping"
No "Rolling"
No "Blow-Outs"

Kokomo Mechanically Attached Tires are Like the "Rock of Gibraltar."

Side walls are as strong and substantial as the tread. These tires can be attached and detached with a small wrench. Write to-day for most interesting literature.

KOKOMO RUBBER CO., KOKOMO, IND.

The HOLSMAN Automobile

Four years of Success. Clears the center of the road by eighteen inches, and therefore has twice the advantage of the ordinary machine. Large wheels, solid rubber tires, air-cooled. Rides like a carriage. The Holsman exclusive patent marks an era in automobile building. Does away with differential gears, friction clutches, pipes, pumps, etc. Reverses without extra gears. No freezing; no punctures; no odor. Send for catalog D.

THE HOLSMAN AUTOMOBILE COMPANY
153 La. Salle Street Chicago, Ill.