INDEX OF INVENTIONS For which Letters Patent of the United States were Issued or the Week Ending October 9, 1906.
AND EACH BEARINGTHATDATE [See note at end of list about copies of these patents.] Abrasive apparatus, $\mathbf{O}$. C. Wysong.
Aerophore, L. De

 Cof of iron and stein, self-barde.ing,
churchward Amusement device, A:Mercer

Ankle corset, G. Krieger $\ldots \ldots . . . . . . . . . .$.
Ash shovel and
sifter, combination,






Binder frame cover hinge, $\dddot{\text { w. }}$. . Wat........


 Book stapling machine, A. E. Lind.......
Boot biack stand recording device,









Building biock, apparatus for making arti-


Calculating, machine, C. C. Hamann.

Car brake, J.
Car
brate
Crane

Car coupling,
Car courn
Coupling,
W. Metterhausen
Kelso

Car, randar, Bridges \& Hateber
Car, steel. Lindstrom \& Streib
car step holder
Car, steel, Lindstrom \& Strel
Car ste hoder, J. Edwards
Car ventilating
Car window, F. P. Harp, H. A. Gadsden.
Carbonating apparatus, linuid, w............. Harris
 aster, Juard. Jones ............... Cattle guard, H. H. Avent
Cement chimne top,
Certificate of deposit, E. Kice
Certificate of deposit, E. Kimber...........
Chocolate creams and the like, making,
Cibar lighter igniter, G. S. Andrews.
Cigarete filling machine, A. Gatz.
Cigarette filling machines, mold cleaner


Coke ing and handling, apparatus for dra


Concrete building store, machine for molding, R. E. Taylor,
 Converters, lining, H. L. Cbarles
Conveeter, C. Whalleg
Conveyer, chain. M H. Ballari.
 Corn sheller, JoJie. Glenn, Jr....
Cotton gin role, A. D. Thoma
Coupling shank, f. Whitrige
Crate for wheelbarrows, M. V. Garver....
Culinary chopper, Bl, Hawbi.........
Cultivator and plow, combined,


 Dental instugument, H. T. Gultman....

Engine and Foot Lathes
 SEBASTANMATHELP CO. 120 Culvert St., Cincin inati. 0 Foot and Power and furret jathe plame


RUBBER STAMP MAKING. - THIS

 sale by Munn \& OC. and all newsdealers. 10 cents.
Manufacturers should investigate the Manufacturers should investigate the
B. F. BARNES MACHINE TOOLS before placing orders. The Tool here
illustrated is our $20 . i n c h$ Drill, and we
have many other sizes to make a very complete line, including Multiole Sping
die Drills. If interested in the latest
Tools for reducin costs of protuctoon
let us tell you what we have. Ask for
F. BARNES CO. Rockford.

## To Book Buyers

We have just issued a new 112-page catalogue of recently published Scientific and Mechanical Books, which we will mail free to any address on application.
MUNN \& COMPANY Pblishers of Scientific Americh
361 Broadway, New York


A Home=Made $100=\overline{\text { Mile }}$ Wireless Telegraph Set



## DURYEA AUTOS



 one tor our" .xatel plan,"andsave money JAGER Marine 4-Cycle Engines

 ander most trying conditions CHAS. j. JAGER CO 281 Franklin, cor. Batterymarch St


Electrical Engineering and Experimental Work of Every Description
 $\underset{\text { Enginering Dey }}{ }$ C. F. SplutporF
"Economo" Emery Wheel Dresser



The Calculagraph But
Anyone Can Do Better
Figuring With
It Than He Can With Brains

The brightest of clerks or mathematicians make mistakes. Sometimes they're tired, sometimes they're sleepy, oftentimes they make errors, which are expensive.
This machine never tires, it can work night and day for years and never make a mistake. The record it gives you of time consumed on a job is a real record, not a guess or estimate.
For the sake of accuracy, write us for further details of this mechanical mathematician.

## CALCULAGRAPH COMPANY 1433 Jewelers' Building, New York, U. S. A.



## 1)

 I)1
1














Merntin. Sef Water elecyitor,

Exumitry tucke H. Climition


 1 1









## A WATCH LABORATORY <br> OR FOR ANY OTHER PUR- DU POSE WHERE AN ACCURBINED WITH A 1-5 SECOND RECORDER IS ESSENTIAL.

## this New York Standard Chronograph

IS THE ONLY ONE MADE IN AMERICA AND THE ONLY ONE FULLY GUARANTEED. FOR SALE BY ALL JEWELERS.

New York Standard Watch Co., 401 Communipaw Ave., Jersey City

## Water Supply Pumps $\begin{gathered}\text { Automatic } \\ \text { No } \\ \text { Repars. }\end{gathered}$





## BUSINESS OPPORTUNITIES.





 throued tonensi and otierwise, or would invest sebor thousand in good business.
THLLL purchase lare active interest in established Mroftabie manufacturint concern desiring toextend its Polatity ivicicator, VEST PoCKET SIZE every electrician; so cents by mail, For furtuer par






SUPERINTENDHNTS. - Men with teconical training,
experience and executive abinity who can hande ment MAN OR WOMAN WANTED by Mail Order Cata-






POSITION WANTED.



## PARTNERS WANTED.




## PATENTS FOR SALE.

 partly Wirked; poom ises fortune. A. Merceret, 47 W


## SITUATIONS AND PROFESSIONAL

OPENINGS.

- Hxport ADVERTISNG SoLICITOR WANTED



## Le

$$
\begin{aligned}
& \text { Metal bar, structural, C. Weber He. Wich of } \\
& \text { Metal beating machine leaf, Heinich or } \\
& \text { Metal plate bending machine, w. Wattie. }
\end{aligned}
$$

$$
\begin{aligned}
& \text { A. L. Ee Berget Din. } \\
& \text { Mixer. See brinder mixer. } \\
& \text { Mixer and bneader, G. L. }
\end{aligned}
$$





Reostat, F. R. Kunkel
Roll, Eynon \& \& Sherifien
Rope drive, T. Jamp


THESE FOUR
PICTURES
in Colors
FREE

T
every reader of this periodical who loves nature and animals and outdoor life, we will send with-
out charge four beautiful pictures, which sell at etail for 50 cents each. These pictures are wonderul examples of the art of color photography, being printed on heavy plate paper by the most improved process. Framed at moderate cost they will make
splendid decorations for den or cozy corner, or they can be used just as they are in any room of the house The subjects represented are such as will appeal to nature lovers generally. Exact size of pictures, $101 / 2 \times 71 / 2$ inches.

Why We Make This Offer This offer is to acquaint you with our new "Standard Library of
Natural History, Which has recently been published, after ears of labor
and at an enormows expense. It is the only work of its klind in existence and at an enormous expense. It is the only work of its klnd in existence
tillustrated from actual photographs, of which itcontains over 2.000, be.
sides many full-page plates showing birds and animals in their natural

 technical or dry, but teems with the most interesting and instruccive stories
of animal life, told by famous naturalists and explorers.
Cier $2,000,000$ of animal life, told by famous naturalists and explorers.
copies have already been sold in Germany and Eng land.

## No Obligation

Your application for the pictures imposes no obligation to purchase the Library. We will forward the pictures, together with a descrip tion of the books, by
mail postpaid. You will not te bothered by agents os canvassers; this Society traisacts all its business bf correspondence.
 correspondence
As an evidence of good faith, enclose 1 cents (stamps or silver) for postage and
wrapping This will be refunded if you request it after examining the pictures. Mail the accompanying coupon promptly, as the supply of pictures is limited.

The Univarsity Society, New York


The University Society
78 Fifth Avenue New York City
Nome.....

## Ready October 20, 1906 The New Agricullure <br> By T. BYARD COLLINS

8vo, Cloth, 376 Pages, 100 Illustrations, $\$ 2.00$ Postpaid

THIS new and valuable work sets forth the changes which have taken place in American agricultural methods which are transforming farm life, formerly so hard, into the most independent, peaceful, and agreeable existence. Farm life to-day offers more inducements than at any previous period in the world's history, and it is calling millions from the desk. The present work is one of the most practical treatises on the subject which has ever been issued. It contains 376 pages and roo illustrations. In brief the contents are as follows: A general statement of the advantages of farm life; the vast systems of irrigation which are trausforming the great West; the principles and importance of fertilization; the importance of canals and good roads; some new interests which promise a profit; some new human creations in the plant world; new varieties of grain, root and fruit and the possibilities which they indicate; improper methods in agricultural practice; new machinery by which the drudgery of life on the farm is being eliminated. The relation of a body of specialists to the American farmer who can have the most expert advice upon every phase of his work without any expense whatever to himself is shown in Chapter X.

## SEND FOR CIRCULAR

MUNN \& CO., "Sclentifichers American" 361 Broadway New York

FIRE PROTECTION

## HOMES. FACTORIES. ETC.

 THE INSTANT'ANEOUS FIRE EXTINGUISHER -adry powder in a tube-isalways kills any fire, even grease, oil gasoline or electric. Best fo
garages, autos, motor boats, etc Can't freeze, and
NEVER CAKES OR CORRODES IN TUBES. Not only the most efficient extin In use by N. Y. Central Lines. Long Island Ry., and hundred of others who want the best. Sen for literature and prices.
want a few high class agents. INSTANTANEOUS FIRE EXTINGUISHER CO No Leaking Valvesand temperature when you use
Ekert "Highest Resistance" Steam Materials

 EKERT HIGH RESISTANCE MA TERIALS CO.
Dayton, Ohio, U. S. A.
J.LLEWELLYN KING SHIPBUILDER ELIZABETHPORT, N. J.. U.S. A Builder of Stern Wheel, Paddle and Screw
Steanners. Torpedo Boats and Barges of all
kinds in Steel. $\boldsymbol{D}$ B A Specialty made of kinds in Steel. 00 OA Apocialty made or
South American and Alaskan River
Hoats, Launches, Dories. Canoes. Etc.

## Valuable Books

## Home Mechanics

for Amateurs


TWENTY-THIRD EDITION EXPERIMENTAL SCIENCE.



revised and entarged edition

## Cyclopedia:

15,000 Receipts. 734 Pages.


rished and erk has been re900 New Formulas



 the eyclopedia may obtain
the
1901 APPEN DIX. $\underset{\text { 1901 APPEN DIS. }}{\text { Price, bound incloth, } 8.100}$


## ?

Why Do We Eat Food was designed to supply the elements of which our bodies are composed, hence we eat to replace the exhausted and worn-out tissues and cells of our physical and mental
being. being.
Our
Our bodies are composed chiefly of four elements: $\quad$ Oxygen, Carbon, Hydrogen and
Nitrogen.
In a body weighing $\mathrm{I}_{4} 8$
lbs. there are 92 lbs. of Oxygen, 3 I lbs. of Carbon, I4 los. of Hydrogen and $4 \frac{12}{2}$ 1bs. of
Nittogen. The Oxygen is derived from air Nittogen. The Oxygen is derived from air must be obtained from food. Nitrogen builds tissue and muscle, Hydrogen and To keep in perfect health and strength all parts of the system must work in harmony. To do this each part must be sup plied with the materials necessary to keep it in perfect repair.
In eating care should be taken to select the food which contains the greatest percentage of the three mentioned elements. A heavy forcing it to take care of food which contains little or no nutriment. There is one food that contains all these elements in such perfect proportion that life and health can be is truly a food fromore than 100 years. It taste, appetizing, tissue-building and health creating. Nature has made it so perfect that man has been unable to equal it. To the invalid it is a perfect elixir. To the man in aged it gives back the elasticity of step and that beauty of complexion all are anxious to acquire. To humanity in general it is a
boon of immeasurable worth. It grows only in a few favored spots on this earth-localities where the vitalizing rays of the sun pene highesttermsinancient and Biblicalhistory. which this delicious fruit-meat could be safely transported to all parts of the world. sarely transported to all parts of the world.
It can now be delivered to your table as perfect as when it was picked from the tree.
It costs no more than inferior food. We want to tell you all about Idyvolas and for that purpose have prepared and illus trated a booklet which we will take pleasure
in sending to you free of cost if you send Dept. 4Io E, Rochester, N. Y., immediately RADIUM AND THE RADIO-ACTIVE




## New Catalogue of Scientific and Technical Books

A new il2-page Catalogue is now ready for distribution. Itis entirely new and lists 5,000 of the latest and best books of a scientific and technical nature. Copies are being mailed to all subscribers to our periodicals, but those who purchase our publications at news stands, or read them in libraries, should send at once for a copy of our Catalogue, which will be mailed free to any address in the world.

MUNV \& COMPANY, Publishers, 361 Broadway, New York City


Before You Invest
 either for a large or small amount. This book gives the
soundest adviea and mays save ou many dollars. Send
twocent stamp for acopo Do
Send your name and address and get the Investors'

3 MONTHS FREE
Tbis will keep you reliably posted onvarious kinds
or investmente. Address
Editor Investors' Review, 1382 Gaff Bidg., Chicago. III.
Weblationk wh



America's Greatest Railroad
Operating more than 12,000 miles of Railway east of Chicago, St. Louis \& Cincinnat comprising the
New York Central \& Hudson River Lake Shore \& Michigan Southern Big Four Route Michigan Central Boston \& Albany Pittsburg \& Lake Erie Lake Erie \& Western Chicago, Indiana \& Southern Lake Erie, Alliance \& Wheeling New York \& Ottawa and Rutland Railroads

For a copy of "America's Winter Re-
sorts," send a two-cent stamp to George
H. Daniels, Manager General Advertising Department, Grand Central Station, New
York.

Passenger Traffic Manager

$2)^{2}$ Trade Marks



## Scientific American.




