for use again in this manner, but the elastic properties of tubing ca not well be restored. Ber. Chem. Ges. 2. In order to prevent India rubber materials from hardening and cracking they are steeped in a bath of melted paraffin for a few seconds, or several minutes, in accordance with the size of the articles, and then dried in a room heated to about 212 deg. F.

(10503) C. N. asks how to bottle horseradish. A. Six tablespoonfuls scraped or grated horseradish, 1 tablespoonful white sugar 1 quart vinegar. Scald the vinegar; pour boiling hot over the horseradish. Steep a week, strain, and bottle. Exposure to the air will

#### NEW BOOKS, ETC.

POCKETBOOK OF AERONAUTICS. By Major Hermann W. L. Moedebeck, in collaboration with O. Chanute and others. Translated by W. Mansergh Varley, B.A., D.Sc., Ph.D. London: Whittaker & Co., 1907. 14mo.; pp. 426; 140 diagrams and illustrations. Price, \$3.25.

This book is a comprehensive résumé of the entire subject of aeronautics. It is written by a well-known German authority, and bas been brought up to date by the various collaborators. The book contains sixteen chapters dealing with such subjects as physics of the atmosphere; meteorological observations in balloon ascents and the computation of results; the technology of gases; the theory, practice, and technique of ballooning, and ballooning from a military standpoint; kites and parachutes; animal flight; artificial flight; airships; flying machines; motors and air screws. All of these subjects are treated in detail. The section of the book dealing with balloons and ballooning is very complete, and includes a brief history of military bal-looning in all the different countries. The question of firing projectiles at and from balloons and airships is also discussed, and there is an interesting chapter on balloon photography.

The section on artificial flight is divided into three parts. The first of these is historical and the other two, by Otto Lilienthal and Octave Chanute, respectively, treat of this subject from a practical standpoint, and describe the various machines of different inventors with which experiments have been made, besides giving the theories of the action of the air upon plane and curved surfaces. The book contains reproductions of a number of excellent photographs of Lilienthal and the Wright brothers in gliding flight. A letter of the Wright brothers, written November 17, 1905, in which they detail their final successful flights with a motor-driven aeroplane, is reproduced. Chapters XIII. and XIV. on flying machines and on motors (by Major Hermann Hoernes) treat very elaborately of the laws of air resistance found by various experimenters, the fundamental laws of aerodynamics, aerodynamical calculations, etc.; and of all kinds of metors such as electric, steam, and gasoline, that come useful to the aeronaut. The Major also has a chapter on air screws, which will be found valuable. The book also contains a list of the different international aeronautical societies, of which there are over a score throughout the world. An Appendix gives many valuable tables and formulæ.

TUNNEL SHIELDS AND THE USE OF COM-PRESSED AIR IN SUBAQUEOUS WORKS. By William Charles Copperthwaite, M.Inst. C.E. New York: D. Van Nos-trand Company, 1906. 4to.; pp. 390; 260 illustrations and diagrams. Price,

\$9. This is an elaborate treatise on the tunnel ing shield and its use in subaqueous work. The book has been compiled from papers printed in the Proceedings of the Institution of Civil Engineers, and from descriptions of tunneling work that have appeared in technical journals. The author is a man of considerable experience in this line of work. He discusses the shield from the date of its invention in 1818 up to the present time, and illustrates all of the various types that have been designed and put in operation. The book contains a chapter on the use of compressed air in engineering work, with some notes on calsson disease. Another chapter discusses the use of cast-iron lining in tunnels. The shield was the invention of Mr. Alfred E Beach, one of the original editors and proprietors of this journal, and with which he constructed a tunnel beneath Broadway in 1869 is illustrated and described. The Greathead shield, which was invented and used about the same time in England, is also discussed in Other chapters are devoted to Chapter IV. the use of the shield in water-bearing strata and the use of the shield in masonry tunnels. Chapter X describes the recent tunneling work carried out in England and in France by means of a shield, or with compressed air. The final chapter of the book is a practical one on the cost of construction and operating a shield. The book is completed by two Appendices give ing a chronological list of events connected with tunneling by means of a shield or compressed air, and also giving English patents relating to this manner of tunneling from 1818 to 1904 inclusive. This book is especially recommended to engineers or others wishing to become familiar with this fascinating subject.

#### INVENTIONS Wood-working INDEX OF

For which Letters Patent of the

United States were Issued

for the Week Ending

April 2, 1907.

AND EACH BEARING THAT DATE

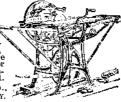
See note at end of list about copies of these patents.

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)	Dental swaging device. G. J. Weber. \$49,297 elsicating maetrial, W. Braun. \$48,960 Desk, flat top, W. Anderson. \$49,096 Detector device. S. W. Wardwell. \$49,296 Dies, P. Rieseck. \$48,296 Dies, P. Rieseck. \$48,623 Display faxture. L. M. & F. A. Beeler. \$48,623 Display rack, W. C. Hahn. \$49,066 Display rack, R. S. Hicks. \$49,066 Display stand. S. Brackstone. \$48,718 Distilling, H. Hirzel. \$48,500 Door, I. Kostelanitz. \$48,661 Door fastener, I. A. Fleming. \$48,817 Door fastening. V. W. Blanchard. \$49,322
ļ	Detector device, S. W. wardwell \$49,226 Dies, P. Rieseck 848.688 Display fixture L. M. & F. A. Beeler 848,623
ĺ	Display rack, W. C. Hahn       849.066         Display rack, R. S. Hicks       849.069
ļ	Display stand, S. Brackstone 848.718 Distilling, H. Hirzel 848.903
İ	Door, I. Kostelanitz         848 661           Door fastener, I. A. Fleming         848.817           Door fastening, V. W. Blanchard         849,322
į	Door lock, sliding, L. Cator
:	Door securer, H. D. Flegel
i	Door opening evice, U. M. Edwards
1	Prainer, G. W. Prince 848,683 Prier. See Rotary drier. Drill scraper, disk, E. R. Beeman. 849,187
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ļ	Electric circuit protective device, Lord & Erickson
ļ	Stevens
ļ	Prier. See Rotary drier. Drill scraper, disk, E. R. Beeman. \$49,187 Drip pan, A. C. Schneider \$49,165 Dust pan, J. P. Hill \$49,235 Duster, S. L. Pendergrass \$48,920 Ear muff attachments for hats, H. Borneman \$49,102 Ear phone, electric, L. F. Clarke \$49,353 Eaves trough hanger, E. T. Wildsmith \$48,795 Elastic wheel, M. Cosset \$48,795 Electric circuit protective device, Lord & Erickson \$49,148 Electric conductors, connector for G. E. Stevens \$49,028 Electric feeding mechanism, A. W. Sherwood \$48,928 Electric governor, E. Schattner \$48,928 Electric junction and outlet box, Hoffmann & Appleton \$48,994
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	ing, W. Stott Engines, fuel feed for hydrocarbon, E. T. Cable Engines, fuel feed for hydrocarbon, E. T. Cable Engineer's alarm, E. McClintock S49,048 Excavating bucket and cutter, J. Helm. S48,743 Excavating machine, J. Helm. S48,743 Excavating machine, C. G. Page. S49,082, 849,337 Excelsior cutting machine, W. D. Craig. S48,834 Excavating machine, C. G. Page. S49,082, 849,337 Excelsior cutting machine, W. D. Craig. S48,834 Excelsior cutting machine, W. D. Craig. S48,834 Excelsior cutting machine, W. D. Craig. S48,831 Excelsior cutting machine, M. J. Fisher. S48,932 Excelsior craig machine, M. J. Fisher. S48,917 Fabric dressing or stiffening apparatus, pile, Fabrics, stiffening pile, F. E. Kip. S48,908 Fabrics, stiffening pile, F. E. Kip. S48,908 Fare registers and tecorders, variable gear- ing for, D. B. Whistler S49,303 Fastener, separable, S. Hainsfurther. S49,303 Fastening device, W. Billingsley. S49,047 Feed water purifier, J. S. Clarke. S49,301 Feed water purifier, J. S. Clarke. S49,301 Feeder water regulator, L. Westcott. S49,301 Feeder water regulator, L. Westcott. S49,301 Fence post, W. Petersen. S48,847 Fence post, W. Petersen. S48,847 Fence post, W. Petersen. S48,943 Filer, bill, E. W. Kruse. S49,239 Filter, J. T. H. Paul. S49,047 Fire salarm apparatus, Clay & McKenney. S48,943 Fire shurter, R. R. Reed. S48,853 Firearm, W. H. Boust. S49,059 Filludia agitator, J. P. Perkins. S49,059 Fluidia agitator, J. P. Perkins. S49,069 Fluidia agitator, J. P. Perkins. S49,069 Fluidia agitator, J. P. Perkins. S49,069
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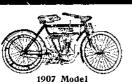
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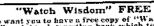
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 	Transmission mechanism, G. S. Comsteck. 848,67 Trans, Houtsinger & Stilson	35 ( 70   37 (	Cotton Dipece goods, waterproofed, William L. Barrell Co	61,765	
í į	Trolley track switch, overhead, F. Kramer 849,33	50 25 (			l
e	Trolley wheel, G. B. Nussbaum       849.20         Truck, E. C. Bruen       848.80         Truck, A. P. Sands       849.20         Truck, Schafer & Wanee       849.20         Truck, car, W. P. Bettendorf       849.10         Truck, Car, W. P. Bettendorf       849.11	22 70 I	Dannsk table cloths, napkins, and towels.  Neuss. Hesslein & Co. Dental alloys and instruments made therefrom. C. A. Fones.  Disinfectants, Johnson & Johnson	61,757   61, <u>647</u>	ı
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	pressing, F. A. Langen	42   I	Dust when sweeping, preparation to absorb, St. Louis Bust Settling Co	61,656 61,691	=
t t	Type in type galleys, clamping, R. W. Geeb 848,88 Typewriter carriage, E. B. Cram. 849,0 Typewriter operator, B. F. Hutches, Jr. 848,61 Typewriter ribben mechanism, A. Schnee- loch 849,3	96 83 I 55 I	Co	61,639 61,649	
t, '	Typewriter ribben mechanism, A. Schnee- loch	39   I 54   I	Electric lighting outfits, decerative, Jaeger Miniature Lamp Manufacturing Co	61.729 61,710 61,663	
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y -	Typewriting machine, H. S. McCormack. 848,77 Typewriting machine, F. X. Wagner 848,77 Typewriting machine, H. L. Wagner 848,78	64 87 F 88 ¦	Films, plates and photographic papers, Actien-Gesellschaft fur Anilin-Fabrika- tion Fire extinguishing compounds, Pluyius- Feuerloscher-Gesellschaft mit beschrank-	i	
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t d	Vault light, McGuigan & Priddle 849,26	30 F 34 38 F	Hair tonic, talcum possder, tooth powder, and skin food, S. P. Burbank 6 Hair tonics and dandruff cures, C. Hughel. 6	31,697 31,775	1
c ;.	Vehicle body spring support, L. N. Stewart. 848,86 Vehicle brake, Lukens & Diehl. 848,66 Vehicle storm front, H. D. Pursell. 849,16 Vehicle wheel, T. Jones 848,77 Vehicle wheel, C. A. Gauld 849,66 Vehicle wind shield, G. Huillier. 849,66 Vehicle wind shield, G. Huillier. 849,26 Vehicle wing sparstys J. C. Corporation of the state of the stat	19 H 139 H 147 I 12	Hair tonics and dandruff cures, C. Hughel. 6 Hammocks, D. W. Shoyer & Co. 6 Hose supporters. George Frost Co. 6 inks, printing and lithographing, E. F. Rychen	51,717 51,772 51,741	J
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-	oned. J. Eisman 848,77 Wall forming mold. W. D. Ham. 849,12 Walls and other surfaces, decorating, E. Switzer 848.86	32 N 26 N 37 N	dedical compounds, certain, Kaine Co of dedical preparations, certain. Walther Man- ufacturing Co	31,707 ) 31,793	
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t	& Thowless	76 N	& Brothers	31.734	í
! Ē	Water closets, lavatories, etc., flushing apparatus for, M. Mendoza	52   N	declicinal preparation for coughs. colds, and croup, T. W. Larwill fedicine, certain, M. J. Breienbach. 6 declicine, certain, Society of Chemical Industry in Basic.	31,756 31,767 31,791	b b I
	Datey et al.   S49.2		Medicines, certain, W. C. Burk	1,698 1,762	e e
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	Water heating apparatus, V. W. Blanchard, 849.31 Water motor, L. M. Shaw	26   N	Metal, store, silver, and glass polishes, Citizens' Wholesale Supply Co	61,642 61,670	T t b
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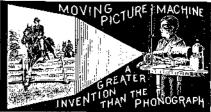
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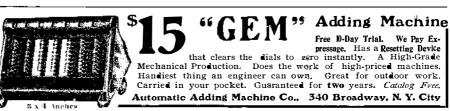
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