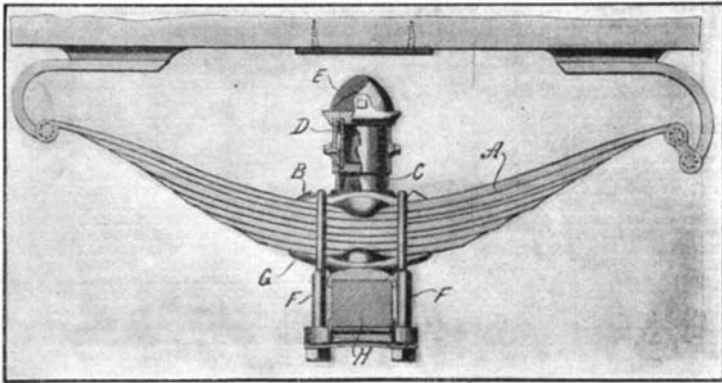




**VEHICLE SPRING BUFFER.**

With a view to relieving the springs of a vehicle from sudden jars under heavy loads, and thus preventing them from breaking, Mr. Peter McKay, of Day Dawn, Murchison, Western Australia, has invented the buffer which we illustrate in the accompanying engraving. The buffer, which is of simple design, may be readily clamped to any vehicle spring.

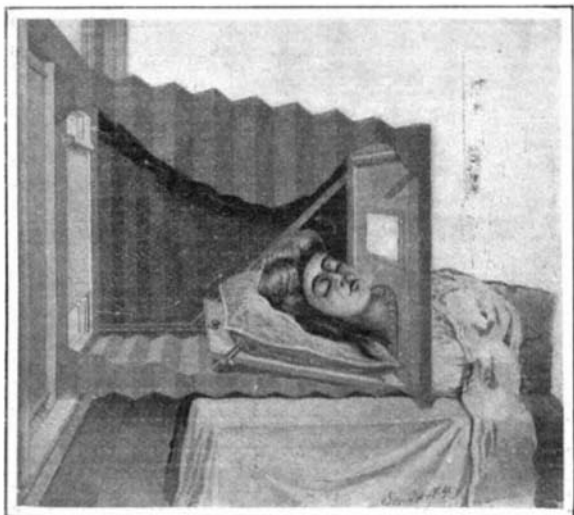


**VEHICLE SPRING BUFFER.**

shows at A a vehicle spring of common type. Mounted on this spring is a plate B, which is formed with an annular channel, and in this channel a tubular member C is seated and secured. The member C telescopes with an upper member D formed of two tubes, one within the other, and spaced apart to form an annular recess which the member C is adapted to enter. To limit the relative motion of members C and D, studs are threaded through the outer tube D, and project into slots formed in the tube C. The inner tube D carries a plunger head, which is adapted to engage a block of rubber, secured to the plate B within the tube C. Mounted on the upper end of tube D is a cap plate, which carries a hemispherical block of rubber, over which a cap E of softer rubber is secured. The buffer is held in place on the spring A by means of yoke pieces F, which engage the plate B and a plate G, fitted against the under side of the spring. These yoke pieces are formed with extensions, which are bolted to a plate that passes under the axle H. In operation, when the spring A is forced down excessively, a wear plate on the vehicle will engage the cap E of the buffer, forcing the plunger head carried by member D into engagement with the rubber block on the plate B, thus relieving the spring from undue pressure.

**FRESH-AIR CABINET.**

In the treatment of tuberculosis fresh air is most essential, and in order to obtain plenty of fresh air at night it is customary in many sanatoriums to have the patient sleep with his head within a cabinet which communicates with an open window. A cabinet of this general class, but possessing many valuable improvements, is illustrated in the accompanying engraving. Primarily, the cabinet is collapsible and when not in use may be folded into a small compass. In addition to this the invention provides a curtain at the outer or window end of the cabinet which may be raised or lowered to regulate the amount of air admitted, while the opposite end of the cabinet is equipped with a curtain arranged to fit snugly around the throat of the patient so as to protect the body from drafts and exposure. Our engraving shows the cabinet with one side removed so as to reveal the interior details. The main frame of the cabinet is extensible laterally, so as to closely fit any size of window frame. In its



**A FRESH-AIR CABINET.**

extended position it is secured by means of thumb screws. The bottom of the frame which rests on the window ledge, and the top of the frame on to which the window sash is lowered, are provided with weather strips of flexible material. The frame at the opposite end of the cabinet is adapted to rest on the couch or bed, and is connected with the main frame by means of brace rods which are slidable upon each other and adapted to be held in extended position by means of thumb nuts. The front and rear frames are also connected by means of a hood in the shape of a camera bellows. The curtain at the front end of the cabinet is mounted on a spring roller which is spaced a short distance from the upper end of the frame to provide an air passage. The curtain may be lowered to any degree desired and is held in place by means of spring-pressed rods bearing against the side of the frame. A similar curtain is mounted at the inner end of the cabinet on a roller which is placed at the top of the frame. The lower portion of this curtain is provided with an arched opening braced by a wire rod and provided with a flexible flap which rests against the throat of the patient. In this curtain there is a small window covered with transparent celluloid. Within the cabinet is a pillow rest which consists of a board hinged at one end to the rear frame, and suspended at its outer end by means of hangers from the upper end of this frame. The hangers are slotted to receive threaded studs projecting from the pillow rests and, by means of thumb nuts on these studs, the rest may be secured at any desired position. Our engraving shows the cabinet in use and the course of the air through it is indicated by means of arrows. The inventor of this improved cabinet is Mr. J. H. Williams, of Columbia, S. C.

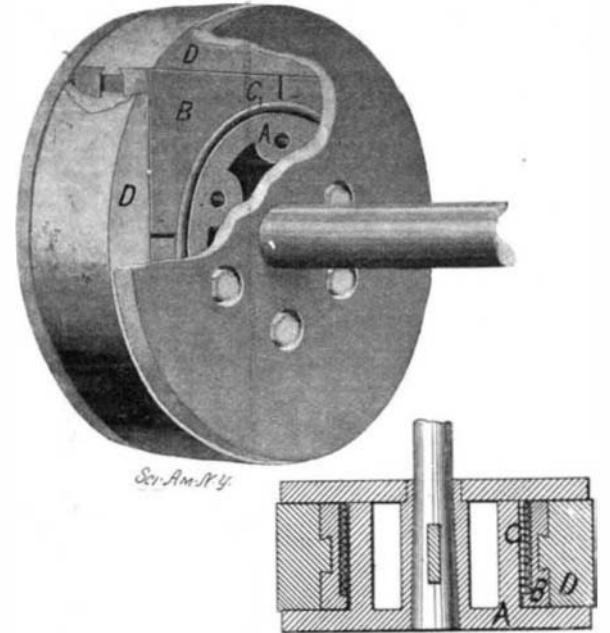
**The Current Supplement.**

The current SUPPLEMENT, No. 1624, opens with an article on "The Passing of American Square-Rigged Vessels," by James G. McCurdy. Mr. F. C. Fish thoroughly discusses the ethics of trade secrets, and likewise presents much legal information that must be of interest to inventors. Mr. A. Frederick Collins writes on the making and use of a wireless telegraph tuning device. This article is naturally to be read in connection with the previous articles by Mr. Collins on "The Design and Construction of a 100-Mile Wireless Telegraph Set" (published in SCIENTIFIC AMERICAN SUPPLEMENT 1605); "The Location and Erection of a 100-Mile Wireless Telegraph Set" (published in SCIENTIFIC AMERICAN SUPPLEMENT 1622); and "The Installation and Adjustment of a 100-Mile Wireless Telegraph Set" (published in SCIENTIFIC AMERICAN SUPPLEMENT 1623). One of the difficulties which every wireless telegrapher experiences is that of bringing the receiving circuits of the receptor into sharp resonance with the oscillation circuits of the transmitter. How this is accomplished Mr. Collins explains by the help of diagrams in the present article. Mr. Elihu Thomson writes authoritatively on alcohol engines as a future power. The Hon. Sir Lewis Michel, well known as one of the late Cecil Rhodes's associates in South Africa, contributes an excellent article on the Cape to Cairo Railway. Dr. H. W. Wiley, who is responsible for the pure food law, states how the whiskies of Great Britain and Ireland are made. Among the minor articles of interest may be mentioned those on "Varnish," "The Valuation of Bread," "Treatment of Concrete Surfaces," "Selecting the Proportions for Concrete," "Vibrations of Passenger Cars," "Development of the Frame of Freight Locomotives," "Some Requirements of Carbureter Design."

**METALLIC PISTON PACKING.**

The accompanying engraving illustrates an improved metallic piston packing composed of comparatively few parts, and arranged to prevent leakage of steam in the cylinder from one side of the piston to the other. In addition to this, the device is so designed as to compensate for all wear of the interior contacting surfaces of the engine cylinder and the packing, thus requiring no reboring of the cylinder. As pictured in the engraving, the improved packing is arranged between two heads keyed to the piston rod. The head A is formed with a spider, which serves to space the heads apart and provide an outer annular recess between them. In this recess the blocks B are fitted, and between them and the spider are a series of springs C. There are four of these blocks B, and their inner edges are curved to fit against the springs. The outer edges of the blocks are angular, and are formed with dovetailed grooves adapted to receive dovetailed tongues on the segments D. It will be observed that the aligned edges of two adjacent angular blocks are engaged by one segment D, and in order to insure a complete fitting of the segments on the blocks, two opposite segments are formed, with longer dovetailed tongues than the inter-

mediate segments. The segments D, it may be observed, are formed with curved outer faces adapted to engage the inner surface of the cylinder. In practice the springs C, pressing against the blocks B, hold the segments D in firm contact with the cylinder, and consequently all wear between the contacting surfaces

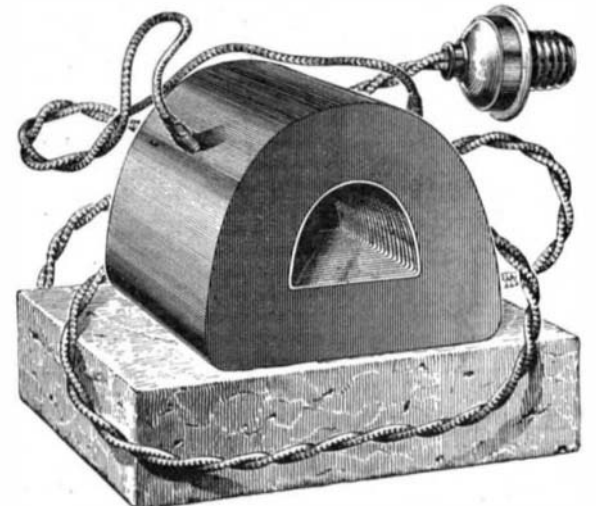


**METALLIC PISTON PACKING.**

is compensated for, and leakage of steam from one side of the piston to the other is completely prevented. It will be seen that by providing dovetailed connection between the blocks and the segments, they are held together, but allow sliding movement of the segments on the blocks without danger of their becoming disconnected. While this packing is applicable on any engine it has been designed particularly for use on locomotives. The inventor of this improved piston packing is Mr. N. Pfaum, 77 Schmidt Building, Pittsburg, Pa.

**A NEW ELECTRIC FURNACE.**

At the recent meeting of the American Association for the Advancement of Science, an electric furnace of novel type was exhibited by Prof. William H. Bristol, of Stevens Institute of Technology. This furnace is of the form used by dentists and in laboratories to heat small articles, pieces of metal and the like, to a high degree of temperature. As ordinarily constructed, furnaces of this character consist of a receptacle formed of clay in which a coil of fine wire is embedded. As this wire is heated it expands more rapidly than the clay, and tends to crack the receptacle, unless the heat is applied very slowly. Ordinarily, it requires from ten to fifteen minutes to bring the furnace safely to maximum heat. Prof. Bristol's furnace consists of a receptacle of fused quartz wound with the wire of the heating coil, each turn being insulated from the adjacent one by a cord or thread of asbestos. The heating chamber thus formed is then incased in a refractory non-conducting material, such as asbestos. The coefficient of expansion of quartz is extremely low, and as a consequence, it may be suddenly heated or cooled over extreme ranges without cracking. Hence, the full current may be applied at once to the quartz-lined furnace, and the maximum heat will be attained within less than a minute. The heating coil is made of platinum or platinum alloy wire when temperatures as high as 2,300 deg. F. are desired for hardening high-speed steel. For the treatment of carbon steel, at temperatures up to 1,600 deg. F. it is expected that nickel wire may be used for the heating coil. A number of these furnaces are now being employed in a manufacturing plant for hardening small, round pieces of carbon steel.



**A NEW ELECTRIC FURNACE.**