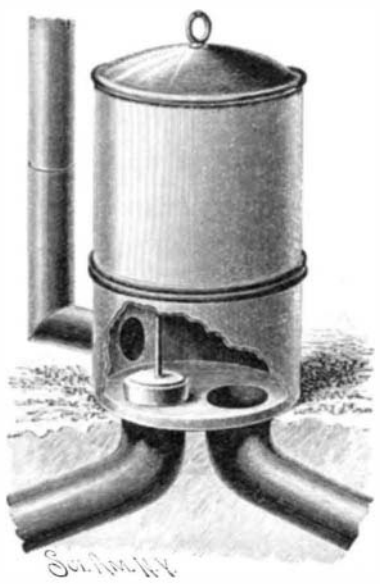
AN IMPROVED RAIN WATER CUT-OFF.

By means of the cut-off spout shown in the illustration a portion of the water from the roof may be discharged into the sewer, and, after the first water has been run off, carrying away the accumulated dust, etc., the stream may be readily diverted into the cistern or other reservoir. The improvement has been patented by Mr. Edward A. King, of St. Joseph, Mo. The roof spout leads into a receiving chamber, preferably made in two sections, and provided with a lid or cover, this



KING'S CUT-OFF SPOUT.

chamber having two outlets in its bottom for the discharge of water to the cistern or the sewer, while the receiving inlet is low down in one side. All these openings are surrounded by nipples to facilitate the connection of the pipes with the chamber. A plug or stopper is provided for the closing of either of the bottom outlets, the stem of the plug extending up within convenient reach when the cover is removed. The first water from the roof is directed into the sewer by placing the plug in the cistern pipe, and after the roof has been well washed, the plug is changed to the other opening, closing the sewer pipe and leaving the cistern pipe open, so that the clean water will pass into the cistern. The several parts are preferably made of terra cotta or other earthenware, to secure cheapness and durability of construction, and by making the receiving chamber in two parts it can be more cheaply made and transported.

Tests of Life-line Rockets.

One of the most important tests lately held for firing life-line rockets by life-saving crews to disabled vessels was made at Craney Island, Va., under the supervision of Lieut.-Commander W. T. Burwell. The test was made in a twenty-mile wind. Four rockets were tested. Each weighed 150 pounds and was fired with the following results: First, 1,200 feet; second, 1,552; third, 1,750; fourth, 2,218. The time of flight of the first two was seven seconds each; third, eight seconds; fourth, ten seconds.

Sulphonal.

In a lecture delivered at the Congress of German Neurologists in Baden, June, 1891, Dr. Gilbert, of Baden Baden, describes four cases which were treated in the sanatorium there. Two of the patients were under treatment for the sulphonal habit, as it had become a perfect mania, so much so that the absence of it caused symptoms similar to those experienced when overcoming the morphia habit. This was not the case with the other two, but serious symptoms were evident. Besides the well known injurious effects produced by the use of sulphonal, all the four patients were unable to write straightly and distinctly. The characters were unsteady, and in an ascending line from left to right. Attention is called to the fact that although the effects of sulphonal are well known, still it is used as freely as ever. In Germany it can even be obtained at chemists' shops without medical prescription. In conclusion, when the use of this drug seems unavoidable, it is recommended that it should be prepared as follows: Boiling water is poured on the dose of sulphonal, and the mixture is cooled by constant stirring until it is just palatable. By this means precipitation is nearly avoided, and the drug enters the stomach in a dissolved form. Thus sleep is said to be generally produced in from fifteen to twenty minutes, and the troublesome feeling of weariness, enervation, etc., usually experienced by the patient on the day following the use of sulphonal does not appear.—*Lancet.*

FIFTY cents per pound is now the price for aluminum in large quantities.

Alloy for Bearings.

The formula used on the Pennsylvania Railroad in making the standard bearings patterned after alloy "B" is as follows:

	Pounds.
Copper	105
Phosphor bronze, new or scrap	60
Tin	9¾
Lead	25¼

By using ordinary care in the foundry, keeping the metal fairly well covered with charcoal during the melting, it is entirely possible to get perfectly successful castings in car bearings on the above formula. The copper and the phosphor bronze can be put in the pot all at once before putting in the melting hole. The tin and lead should be added after the pot is taken from the fire.

It is, of course, a fair question whether the introduction of a little zinc, or possibly some other combinations of the six or eight metals commonly used for alloys, will not give a bearing metal much better than the alloy "B." All that I can say on this point is that alloy "B" represents the best knowledge that we have on the subject at present, and the whole thing may be summed up by saying that at present the best bearing metal that we know of is a copper-tin-lead alloy, containing a small amount of phosphorus, in which the proportions of the constituents are approximately those shown above.

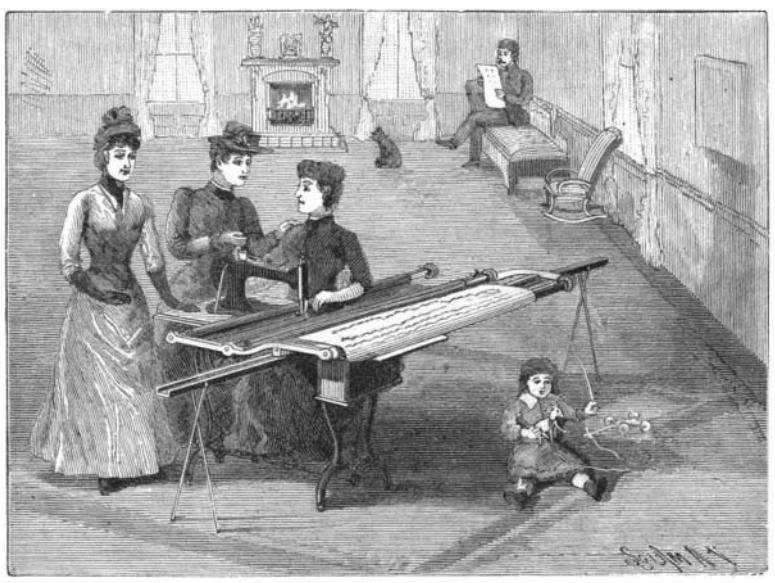
A satisfactory bearing metal should be of such a nature that it will sustain the load without crushing; that it will work well in the foundry; that it will not heat readily; that it will make the friction between the rubbing surfaces as low as possible, and that it will give the highest possible mileage with the smallest possible loss of metal by wear. It is believed that the metal described fulfills all these requisites as well as any alloy now known.—*Dr. C. B. Dudley.*

What the Census Determines.

One of our exchanges concludes, after studying the census, that probably no one who has not obtained information on the subject could make a reasonable guess at the number of places in the United States containing one thousand or more inhabitants. The guesses by the uninformed are usually from 10,000 to 15,000, but the United States census discloses only 3,715. Moreover, there are only 2,552 that have a population exceeding 1,500. At the other end of the line the returns are no less remarkable, for there are only seven cities with a population exceeding 400,000. There is abundant room for growth in these cities and towns, but the places with 1,000 or more population already contain 41 per cent of the total population of the United States. The larger cities, it appears from the returns, are growing more rapidly than the country at large. Thus in 1880 there were 286 places having 8,000 inhabitants or more, the combined population of such places being 22 per cent of the whole. In 1890 there were 448 such places, containing 29 per cent of the whole population.

AN IMPROVED QUILTING MACHINE.

The accompanying cut represents a new and valuable attachment for all family sewing machines, as by its use one lady can quilt comforts, quilts, coat linings, dress skirts, and any other article which it is desired to have filled with cotton or wool. The construction is simple, and any one who can run a sewing machine can operate one provided with this attachment. The top of the work to be quilted is rolled up on the inside roller, and the lining of the goods is rolled up on the outside roller, the cotton or wool is laid on the lining,

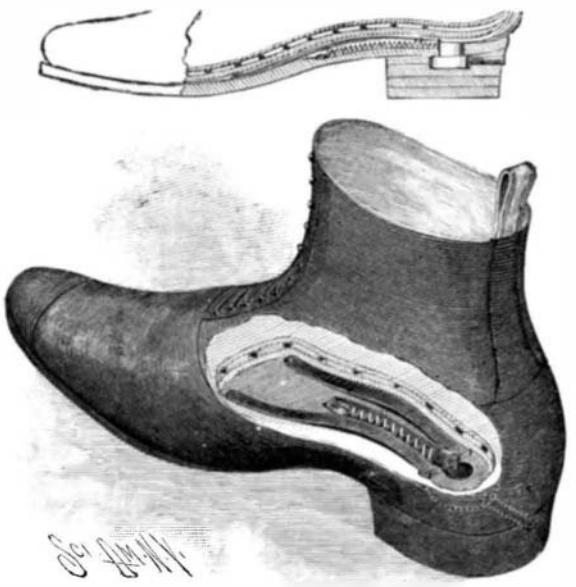


DAVIS' NEW FAMILY QUILTING MACHINE.

one layer at a time, and as the goods are quilted the quilted parts are rolled up on the inside roller. These operations are repeated until the goods are all quilted. This machine is manufactured by the inventor, Henry T. Davis, 18 to 30 W. Randolph St., Chicago, Ill., U. S. A.

SANITARY, VENTILATED BOOTS AND SHOES.

Wool, hair, fur, and feathers—consisting essentially of the same constituents—are the natural covering of animals in every clime and at all seasons. Many attempts have been made to popularize wool-lined shoes, especially for winter wear; but in none of them has effectual provision been made for ventilation, where it is more especially needed. Consequently the perspiration was arrested, or retarded, or retained in the shoes, to obviate which the ventilated shoe was



GREEN'S VENTILATED BOOT OR SHOE.

invented, and improved, as shown in the accompanying illustrations. The cuts are nearly self-explanatory.

The sectional views represent the lower part of the shoe, showing the ventilating device in detail. The shoe is lined with the so-called "Jaeger sanatory all-wool fabric." Immediately beneath the foot is an exceedingly porous felt insole lining. Under this lies the insole, made of tough wool felt, also porous and freely perforated, thus facilitating the passage of air to and from the foot, by way of the air duct opening externally at the heel, and communicating with the air well in the heel. Between the insole and the usual leather outsole, another layer of porous wool felt is used as a filling. As these three layers of wool, and one thickness of leather, are not held in position by any adhesive substance, but by stitches at the edges only, there is nothing to interfere with the free passage of air, in and out, throughout their entire length, with each step of the foot. The circulation of the air is promoted by the action of the steel shank springs, which facilitate the pumping action at each movement of the foot; and the spiral spring tube lying between the springs keeps the passage open to the air well in the heel. This ventilated shoe has been patented by Mr. John Green, and further information respecting the above described invention may be obtained by addressing the Dr. Jaeger's Sanitary Woolen System Co., 827 and 829 Broadway, New York.

The Wear on Heels.

Charles Schuette, the shoemaker, said: "Very few men are knock-kneed, a fact that is proved by not one pair of shoes in a hundred coming in to be repaired with the heels worn down on the inside. The percentage of soles worn this way is a little larger, but that is often caused by the toes being turned in instead of out. About one man in ten will wear his heels down at the extreme rear, but for every one of these there are at least half a dozen who will wear the outside right to the welt before the center shows any signs whatever of giving out. Physicians say that this bow-legged tendency is the result of children being encouraged to walk before their legs are strong enough to bear the weight of their bodies, and if this is so, the error must be very general. In making shoes to order it is usual to run two or three extra rows of nails or brads where the tread is heaviest, and some customers ask to have iron protectors driven in. The best device of this kind is a steel wedge driven into the leather, which thus cannot wear down any faster than the steel, but the objection to this is that when a man walks on a granitoid sidewalk, he makes almost as much noise as if he was wearing military spurs."—*St. Louis Globe-Democrat.*

WHITE lead is poisonous to most people; but there are examples of individuals who are unaffected by it. John Jarvis worked for over 50 years in the well known white lead establishment of Wetherill & Brother, Philadelphia, and always enjoyed good health. He lately died of old age. Thomas McCann was another example. He worked over 55 years in the same concern.