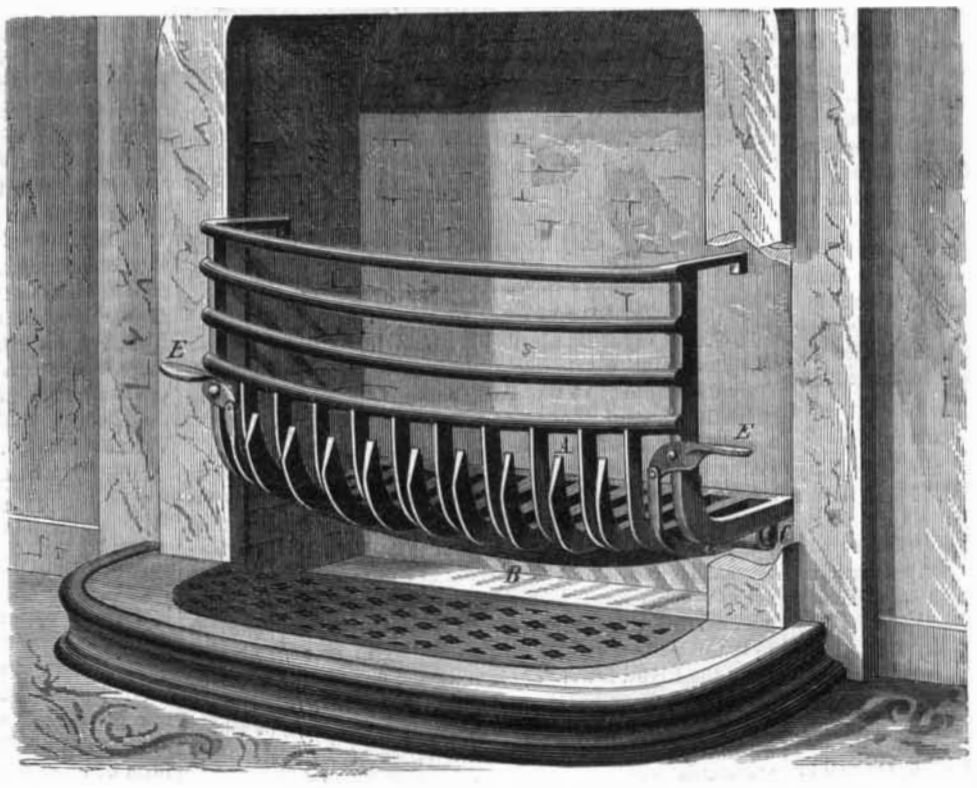
IMPROVED GRATE CLEARING ATTACHMENT.

We illustrate herewith a quite simple device, designed to be attached to the ordinary form of fireplace grate, and to supply a ready means for raking or poking the fire. It may also be adapted for stoves to serve as a drop table, and can be constructed with rods and handles, so as to be operated by hand if so desired.

In Fig. 1 the invention is shown in perspective, and Fig. 2 is a sectional diagram. A are a number of fingers which enter between the interstices of the lower bars of the grate. These fingers are all cast upon or attached to a curved bar, B, the journals of which pivot in projections on the grate at C. Pivoted to lugs on the bar, B, are links, D, one on each side, which connect with short levers or treadles, E. The latter are readily moved by the foot, thus raising the fingers (which ordinarily fall in the position shown in the engraving) and causing them to enter among and and agitate the coals.

The apparatus obviates the necessity of the poker, and serves to rake the entire fire at once, thus accomplishing its object expeditiously and in a thorough and efficient manner.

For further particulars address Mr. A. Tiensch, Memphis, Tenn.



TIENSCH'S IMPROVED GRATE CLEARING ATTACHMENT.

Intermitting Lameness.

The *Doctor* remarks: "A very curious thing has been described by Dr. Sabourin, namely, that lameness may ensue from obliteration of arteries. Horse lameness is often so obscure that any light proves desirable. It is not, however, confined to the horse, but extends also to man. The cause, as observed, is owing to obliteration of the aorta and iliac arteries. Commonly, in previous good health, the subject begins to limp, in one or two limbs to tremble, and finally to fall. Rest is commonly productive of relief. MM. Bouley and Goubaux long ago pointed out the nature of the affection in horses, while M. Charcot first pointed out its occurrence, comparatively rare, in man. Arteritis has been supposed to be the occasion in horses, owing to the violent efforts they have to make, and embolism in men. In any case the occurrence affords a favorable illustration of the advantages of the study of comparative pathology."

THE SHAKER SASH BALANCE.

Our illustration represents a very simple and ingenious device, which does away with the use of the usual cords and pulleys on windows, by making one sash balance the other. It is cheap, readily applied, and will afford all the means for ventilation that side weights do.

Fig. 1

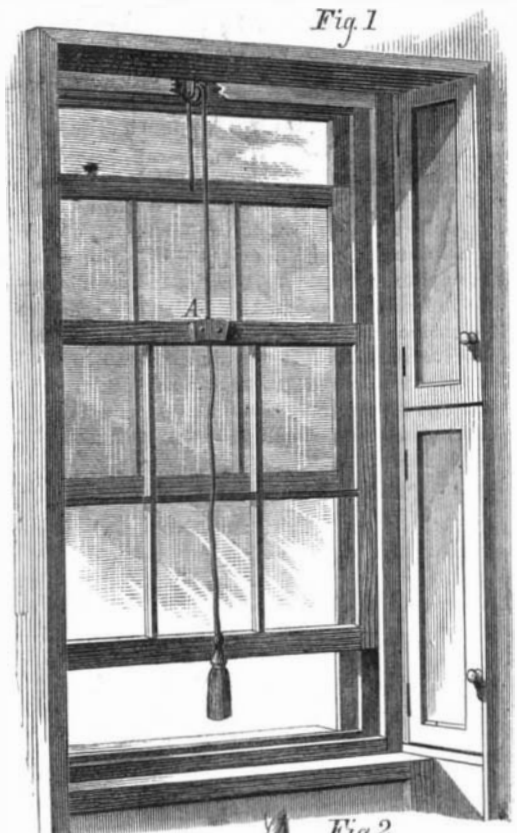
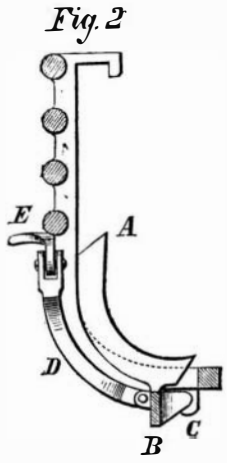


Fig. 2

A cord, Fig. 1, is attached to the center of the upper sash, by passing it, from beneath, upwards through a hole bored to fit, and making it fast by a wedge driven in from on top, and then over a pulley adjusted as represented in the upper part of the window frame. The end extends down through the apparatus, A, which, shown in detail in Fig. 2, forms the essential portion of the device. It consists simply in two eccentrics, B, secured in a suitably ornamented metal case, and fastened to the upper part of the lower sash. It needs no explanation to show that one sash counterpoises the other, so that by a mere touch of the finger each may be raised or lowered to any given distance. If, however, it be desired to move but one, and that the top sash, the operation is readily accomplished by drawing the cord to the right or left, which relieves the grip of the eccentrics. On straightening the line, the latter immediately resume their clasp and hold the sash in any position. To raise the lower sash, it is only necessary to hold the cord firmly and lift the sash with the hand, when it will remain as placed.

Fig. 2



The inventor claims it to be specially adapted to churches, halls, theaters, etc., in order to secure ventilation.

Patented by I. J. Russell, of South Union, Ky. For further particulars regarding sale of rights, etc., address the general agent, Mr. W. J. McGown, as above.

The St. Gothard Tunnel.

The length of this immense work will be 14,900 meters, or 9 miles 715 yards. The altitude of the northern entrance, at Goeschenen, will be 3,703 feet above the level of the sea, and that of the southern entrance, 3,850 feet. The highest point in the interior of the tunnel will be 3,873 feet above the sea level, which will be reached by a rise from the Goeschenen end of 7 per 1,000; from this point there will be a descent towards Airolo of 1 per 1,000. The rock to be traversed is for the most part mica gneiss and mica schist. Great improvements are stated to have been introduced into the perforating machinery employed, but thus far the progress of the works can scarcely be said to have been very rapid. The length of tunnel actually pierced is, however, a little more than 2,330 feet on each side, and an advance of 10 feet is daily made in each gallery at Goeschenen; the rock is perfectly solid, requiring neither planking nor arching; but at Airolo it is necessary to line the gallery and arch the roof with masonry.

Scientific Men Scientifically Studied.

Mr. Francis Galton, well known for his researches in regard to hereditary mental powers, has been pursuing these studies. He made personal inquiries of one hundred and eighty leading scientific men of the day, and on their replies based his conclusions. Most important was the almost persistent combination of remarkable energy of body with remarkable energy of mind. Size of head was considered and, as a general rule, was larger than of ordinary gentlemen. Still, remarkably many scientific men had small heads, and the small heads were remarkable for activity. Health was a marked feature. Independence of spirit and tenacity of purpose were also most marked characteristics of men of science, and notably a large proportion were men of business, as principals of large commercial or mercantile concerns. The great incentive to science seemed, to the author, to be innate taste, and in character he regarded the scientific mind as antifeminine. As to hereditary qualities, that of health seemed most essentially due to parentage; and on the parental side the influence of qualities was apparently on the father's side, in the proportion of 128 to 45 on the mother's side. A combination of all essential qualities seemed necessary to the production of a man of mark, and that the laws of chances and alternatives came in to give actuality to results. In regard to education, the general condition seemed to be that they were not tied down in their studies to particular subjects, but were given to the investigation of many.—*Medical and Surgical Reporter.*

MUNSON'S IMPROVED LIGHTNING ROD.

Electricity, as is well known, can be best dissipated by conductors which present a large number of sharp edges; and if such angles extend throughout the length of the conductor, the current is received at any point, as readily as at the pointed apex. It is with this principle in view that the improved form of lightning rod herewith illustrated has been invented; and in addition to the advantages thus secured, it presents a variety of others, rendering it, it is claimed, a thorough and efficient protection to any edifice upon which it may be placed.

Our engravings represent two of the modes of construction out of the several which the inventor has adopted and successfully used. As shown in Fig. 1, the rod is composed of eight copper wires, A, and two large galvanized iron wires, B, laid up into a single rope. Fig. 3 is a section of the same. In Figs. 2 and 4, the cable is formed of eighteen copper wires, A, and one large core of galvanized iron, B, twisted together as before. The copper wires, it will be noticed, are square in section, and are drawn perfectly straight, so that when they are twisted up in the rod an innumerable number of sharp edges is presented. The iron wire is galvanized, not only to prevent corrosion but to increase its conducting power. The presence of two dissimilar metals in the rod also results in constant magnetic action, whereby its effectiveness and durability is enhanced, while its electric condition is preserved.

There are no joints in the invention to become disconnected and thus offer points of escape for the current. The rod is perfectly flexible, and can be bent to any angle or curve, while it cannot be broken from its fastening by the effect of wind or jars. Its continuity, therefore, is a point of considerable importance, which, taken in connection with the conducting capacity of the metals used, the spiral form, and the other advantages already alluded to, combines to render the device theoretically one of much value. As regards its practical workings, the inventor submits a number of testimonials from insurance companies, architects, and several eminent scientific gentlemen, all of whom speak very favorably of the merits of the rod.

The rod is covered by four patents. For further particulars address Mr. David Munson, sole manufacturer and patentee, 220 East Washington street, Indianapolis, Ind.

Fig. 1. Fig. 2.

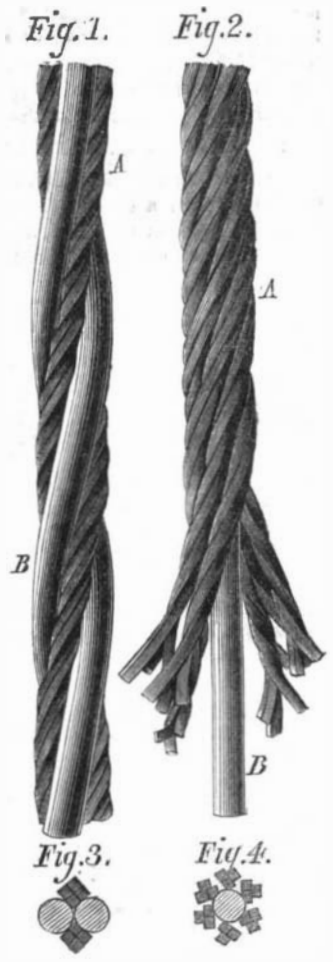
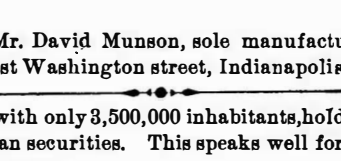


Fig. 3. Fig. 4.



HOLLAND, with only 3,500,000 inhabitants, holds $160,000,000 of American securities. This speaks well for Dutch prudence and economy.

IN our description of the water clock on the Pincian Hill at Rome, instead of "every second minute," read "every second."