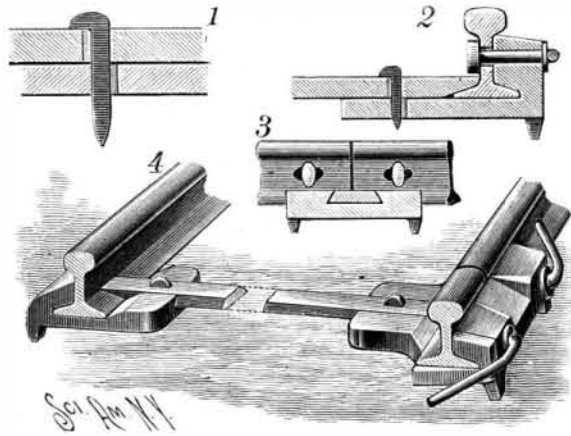


**NEW METALLIC RAILWAY TIE.**

A new railroad tie which is especially constructed for tracks which are frequently laid and removed, as in the case of mines, excavations, etc., is shown in the annexed engraving.

In the cut, Fig. 1 is a sectional view, showing the manner of drawing the parts together by means of a spike, Fig. 2 is a transverse section of the chair and tie as used at the rail joint, Fig. 3 is a side elevation of the rail ends, showing the relation of the chair, the tie, and the rails, and Fig. 4 is a perspective view showing the application of the improvement to a joint and to the middle portion of an improved tie.

The chair which supports the rail is undercut to receive one-half of the rail flange, and in the inner end of



**DAINTY'S IMPROVED RAILWAY TIE.**

the chair is formed a dovetail slot for receiving the iron bar which connects the chairs to opposite sides of the track. The end of the tie adjoining the rail is beveled so as to conform to the shape of the rail flange, and the chair and the tie are apertured in such a manner as to cause a spike, when driven through the bolt, to draw them together upon the foot of the rail, and thus clamp it securely.

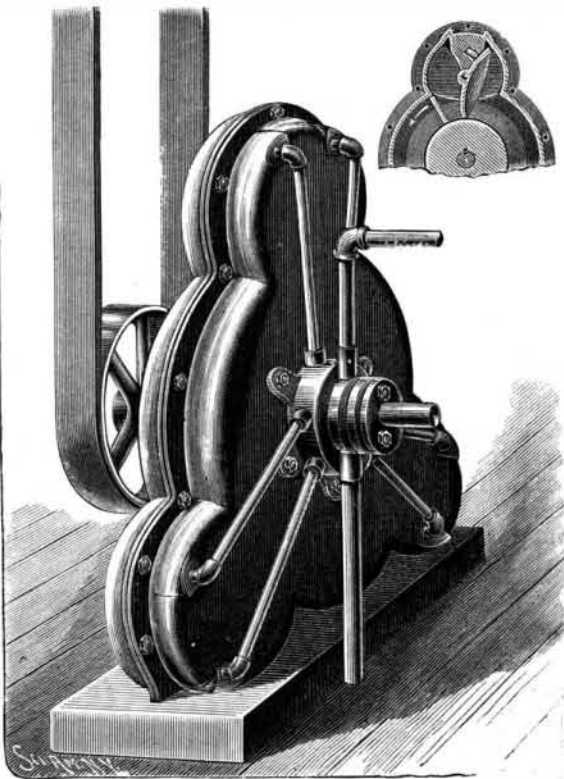
Where the improvement is applied to the rail ends, as shown at the right in the engraving, the chair is somewhat modified to receive two bent bolts having elliptical T-heads adapted to pass through holes of corresponding form in the web of the rail. After insertion in the holes of the rail, the bent ends of the bolts are turned down so as to bring the bolt heads into the position shown in Fig. 3, the heads being arranged at right angles to the elliptical apertures in the rail web. To facilitate turning the bolts, they are provided with washers which bear upon the outer surface of the chair.

With a railroad tie of this construction, the track may be readily laid and as easily taken up. Skilled labor is not required in the construction of a track where these improved ties are employed, as the rails are properly spaced and securely held in the position of use.

This invention has been patented by Mr. Elijah Dainty, of Coal Bluff, Pa.

**AN IMPROVED STEAM MOTOR.**

The illustration represents a rotary engine in which direct steam is applied to two or more parts of the



**FEDELER'S ROTARY ENGINE.**

periphery of the piston at the same time, whereby its expansive force is designed to be more fully utilized, and make an economical engine. It has been patented by Mr. John H. Fedeler, of No. 485 West Twenty-second Street, New York City. Inclosed within the

casing is the body of the motor, which consists of a piston having two wings, and keyed to the shaft, which extends through, and has a bearing in a box screwed into the side of the steam chest. The wings of the piston are on its opposite sides, and fit steam tight in the casing, so that the whole force of the steam will be directed against them. At the top and on each side of the casing, and arranged at equal distances around it, are six chambers, arranged in three pairs, a live steam pipe extending to one chamber of a pair and an exhaust pipe to the other, these pipes radiating from the steam chest on the outside of the casing. Between each pair of chambers is a movable abutment, pivoted to a projection on the inside of the casing, as shown in the sectional view, and adapted to direct the steam against the wings of the piston. The abutments are backed by a spiral spring to prevent them from sticking, and the abutments and the spaces between are respectively one-sixth of the circumference of the cylinder. Keyed to the shaft within the steam chest is a rotary valve, with grooves and openings connecting with the radiating pipes, the direct steam pipes never carrying exhaust steam, but the exhaust pipes alternately carrying direct steam to operate the abutments. The arrangement is such that the live steam, on entering, forces down the abutment behind it, and exerts its full pressure upon a wing of the piston, but before the latter reaches the next abutment this abutment has been closed by live steam admitted through the exhaust, so that the live steam will continue to expand to force the wing of the piston further, the abutments alternately opening and closing as the wings of the piston travel around. In practice the steam enters two steam pipes at the same time, exerting its force simultaneously on both wings of the piston.

**FIRE EXTINGUISHING APPARATUS.**

The annexed engraving represents a compact arrangement of fire hose and fire extinguishing apparatus, which may be placed in any hall or apartment and is always ready for instant use.

The casing is provided with a glass cover which protects the contents, while allowing them to always remain prominently in view. A water pipe leads into the casing, and a short section of pipe is connected with the main water pipe by a swivel joint, which also forms a valve. With this short pipe is connected the hose, which is folded compactly in the case and which carries at its free end a fire nozzle of the usual description. The case is provided with an ax, and it may contain other tools useful in case of fire. In the present case the inventor has provided the casing with a number of hooks for hats and clothing, but this is not an essential part of the invention; it simply serves to partly disguise the real nature of the apparatus. The hose nozzle may also be made to hold fire extinguishing chemicals.

In case of a fire, the door is opened, and the nozzle is grasped and carried to the vicinity of the fire. The act of stretching the hose turns the short swiveled pipe, thus opening the valve and allowing the water to flow. This automatic action of the apparatus is an important feature, as the device may be set in operation by one person.

This useful invention has been patented by Mr. John H. Scholding, of No. 9 Archer Street, Yonkers, N. Y.

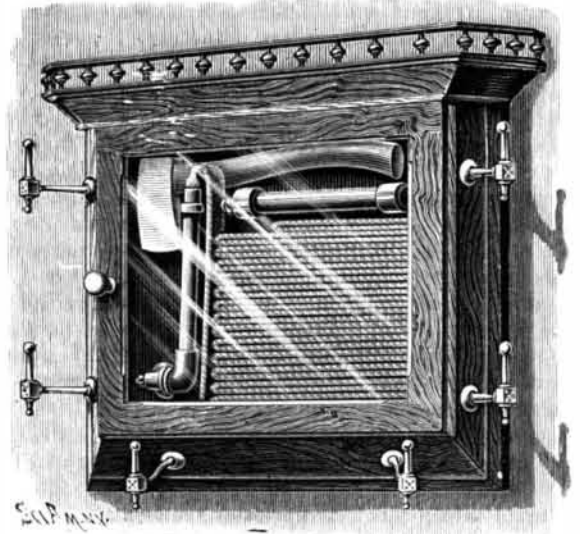
**Photographs in Natural Colors.**

At a recent meeting of the Berlin Physical Society, Professor Vogel spoke on photography in natural colors as attempted at first by Seebeck, then in succession by Becquerel, Niepce, St. Victor, Poitevin, Zenker, and most recently by a Hungarian named Verres. He exhibited a series of photographs in colors obtained by Verres, which, however, showed conclusively that he has not solved the problem, since, although the reds appear as red in the photographs, so also do the yellows and greens appear as red, and the blues as an undeterminate color. These photographs, on the other hand, mark a distinct advance in color photography, since they are fixed, while those of Zenker, although more strikingly colored, were not fixed. The speaker criticized Zenker's views on the mode of formation of a colored photograph, and expressed his disbelief in the possibility of any one substance being so changed by rays of different wave length as to emit, from various parts of itself, rays of exactly corresponding wave length.

**AN IMPROVED SAFETY DEVICE FOR ELEVATORS.**

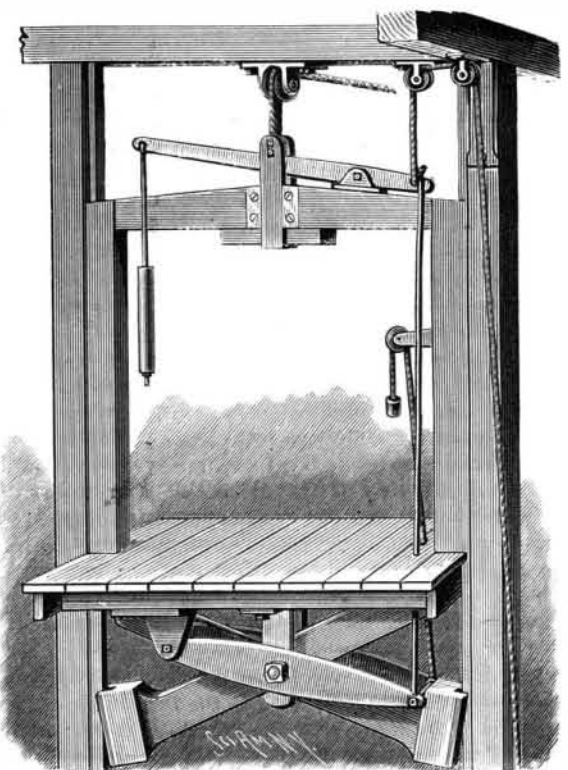
This is a device to automatically lock the elevator cage instantly if the hoisting rope or chain breaks, and also furnish means for controlling the ascent or descent of the cage from within or without. It has been patented by Mr. Philipp Schmidt, of No. 414 South Ninth Street, La Crosse, Wis. Projecting tongues on the upright timbers of the well hole frames retain the platform or cage in sliding contact therewith. Upon the transverse beam at the top of the cage a heavy weight is suspended by vertical opposite limbs connected to the block at their lower ends, the limbs loosely embracing the sides of the beam, and

their upper ends being connected by parallel cross bolts. To the top bolt a wire rope is attached which extends over a pulley and thence downward to an elevator drum or other similar device actuated by hand or power. Beneath the center of the platform is a strong bracket frame having two spaced limbs, to receive the lapped bodies of locking arms and permit them to vibrate freely. The hole for the bolt on which the locking arms are journaled is elongated, that the bolt may have a small vertical motion, and the arms have a



**SCHOLDING'S FIRE EXTINGUISHING APPARATUS.**

short bend near their lower ends, which are grooved to loosely embrace the tongues of the frame timbers, the arms when in locked position being designed to abut squarely against the main faces of these timbers. To afford means for automatically spreading the arms, and thus locking the platform, two parallel bars are pivoted by one end to depending hangers secured to the platform timbers. At their longitudinal center these bars have oblong holes through which passes the bolt on which the locking arms are journaled. On one side of the beam at the top of the cage is a low bracket stand upon which is pivoted a tripping lever, to the short arm of which is loosely jointed the upper end of a connecting rod, the lower end of which is connected to a transverse spacing bolt uniting the outer ends of the parallel bars below the platform, there being also attached to this bolt a short lanyard. The upper portion of the lanyard passes through a bracketed pulley, and has a weighted handle block on its end. A weight is suspended from the long arm of the tripping lever at the top, and from its short arm a cord extends upwardly over pulleys and thence downwardly through the building. Normally the lower ends of the locking bars drop sufficiently by their weight to remove their bearing faces from contact with the side timbers, but if the main rope is suddenly broken, the dropping of the block suspended from the top cross bar of the cage operates the tripping lever and the parallel bars to spread the crossed locking bars and bring them in firm contact with the side timbers. In ordinary use the platform can be stopped at any point by pulling on the weight handle suspended



**SCHMIDT'S SAFETY DEVICE FOR ELEVATORS.**

from the tripping lever, or the handle block on the lanyard, either of which will raise the free ends of the parallel bars and spread the locking arms. This brake is designed to be readily attached to any elevator.