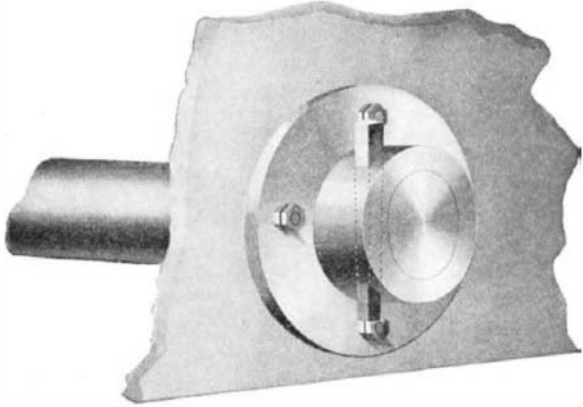


**SHAFT FASTENING.**

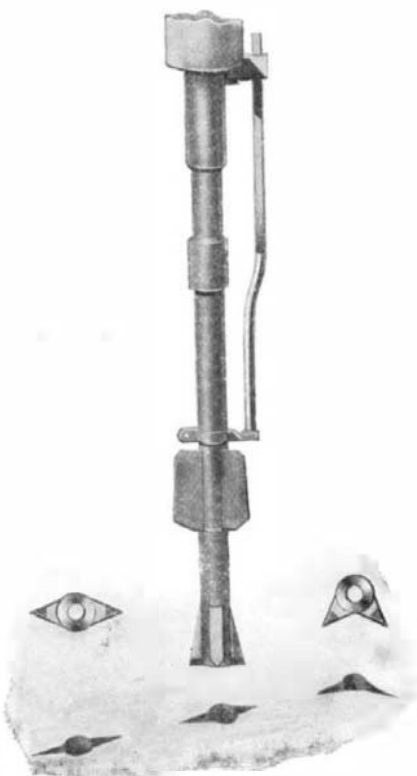
In very heavy machinery, such as stone crushers and the like, where the parts are subjected to excessive strain or jarring, it is important to provide a simple,

**SHAFT FASTENING FOR HEAVY MACHINERY.**

yet substantial means by which a shaft may be secured solidly and immovably in position within the frame of the machine. Mr. William A. Jones, of Branch, Pa., has invented a device of this character. It consists of a flanged sleeve which fits on to the shaft and is secured to the frame by bolts passing through the flange. The sleeve is formed with an inner hub, not shown in our illustration, which is conical and fits into a tapered opening in the frame of the machine, so that by tightening the bolts this hub will be wedged snugly and securely in place. The shaft is held to the bushing by a taper key which is driven into coincident slots formed in the bushing and shaft. The key should be located on the opposite side of the shaft from that on which the strain or pressure is to be exerted. This arrangement will be found advantageous because the shaft will not be weakened by the key slot on the side which bears the greatest pressure. In practice two of these fasteners will be employed on each shaft, one at each end, and as an added security against lateral displacement, the shaft may be turned to a smaller diameter at one end, thus forming a shoulder against which the conical hub at that end may abut.

ROCK DRILL ATTACHMENT.

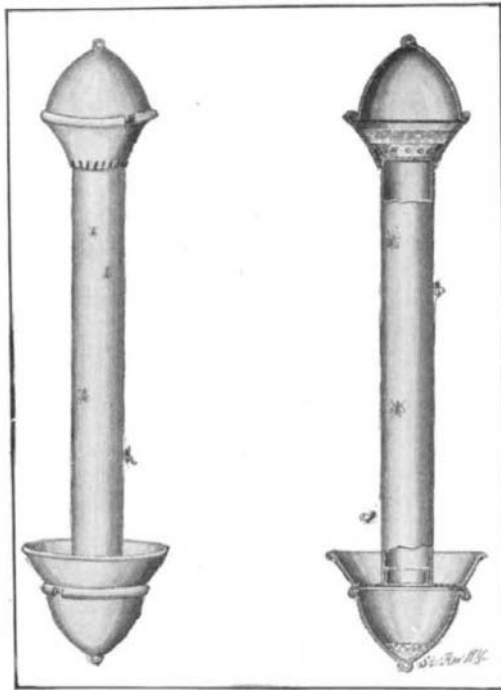
In process of drilling rocks in quarries to form slabs or blocks, it is customary to produce holes in the shape of an ellipse, the holes being disposed in a row along the line of fracture, and the line coinciding with the long axes of the ellipses. We illustrate herewith an improved rock drill attachment, invented by Mr. David Awst Owen, of Granville, New York, which is designed to drill a hole with V-shaped grooves in its wall extending in the direction of the straight or angular line of fracture. The usual drill has the shank turned down to form a reduced portion, on which a cutter is mounted to turn. The cutter comprises a hub with wings extending lengthwise of the hub, either diametrically in alignment, or at angles one to the other, as clearly indicated in our illustration. In operation when the

**ROCK DRILL ATTACHMENT.**

rock drill is set in motion to drill the holes in the usual manner, the cutter moves up and down with the drill, but does not turn with it. After the hole has reached a depth sufficient for the lower ends of the wings on the cutter to strike the rock, the V-shaped grooves will begin to be formed in the side walls of the drill hole. When a corner is reached in the line of cleavage, that cutter is used which has its wings extended at right angles one with the other. When the drill holes are completed and charged with explosives, and the latter ignited, then the rock will split along the line of cleavage much more evenly than with elliptical holes, particularly at the corners. When it is desired to sharpen the drill or the cutter, the several parts can be readily disconnected to allow sharpening. The device is very simple and durable in construction, not liable to easily get out of order, and can be readily applied to rock drills now used, it being only necessary to change the shank of the drill to accommodate the cutter.

A NOVEL FLY-CATCHER.

A new form of fly-catcher has been invented by Mr. Johann Zierl, care of Mr. W. J. Miller, Ballinger, Texas, which consists of a standard or post covered with a tacky substance which will attract the flies and hold them fast. This device is arranged to be suspended in any convenient place, and, as shown in our illustration, is made up of a metal tube, in the upper end of which a flared attachment is fitted, thus constituting a holder or reservoir for the tacky substance employed. To the lower end of the tube, a bowl is attached, which serves as a holder for the flies,

**A NOVEL FLY-CATCHER.**

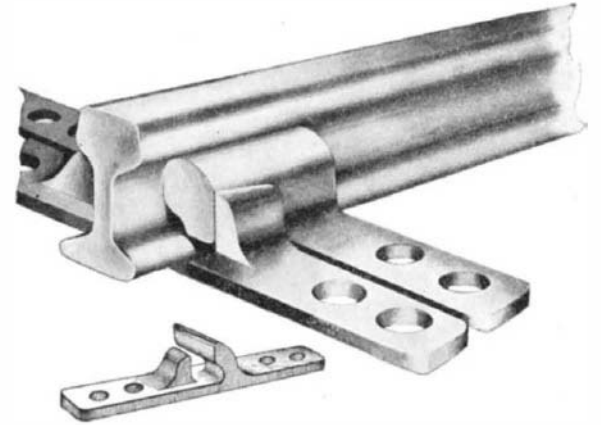
and each end of the device is covered by a cap of conical form. The lower end of the flared reservoir is provided with openings, which register with perforations in the tube, and through these the tacky substance flows from the reservoir, down over the tube, smearing its entire surface. The adhesive substance is sweetened or otherwise made attractive to flies, which, when they alight on the tube, are held fast and slowly carried downward to the bowl by the flow of the sticky fluid. A sieve forms the bottom of the bowl and serves to retain the flies, while the fluid passes on into the cap below. When the reservoir is nearly emptied of the tacky fluid, the caps are interchanged, thus supplying a fresh quantity for the reservoir, and permitting the flow to continue without interruption. The caps are held in place by a form of bayonet joint, that is, each cap is provided with a lug adapted to engage the flanged edge of either the reservoir or bowl, both of which are provided with notches through which this engagement may be effected.

A fly-screen built on the principle of a roller shade has been invented and patented by Melchior Zuger Mayer, of East Rutherford, N. J. The screen is contained in a small casing which is secured to the window casing and which is hardly noticeable. A connection is provided, so that the screen will follow the movement of the sash. This connection can be easily broken, when the sash will work independently. With one of the screens on the upper and lower

portions of the window, the entrance of insects of any character will be effectually prevented.

IMPROVED RAILWAY CHAIR.

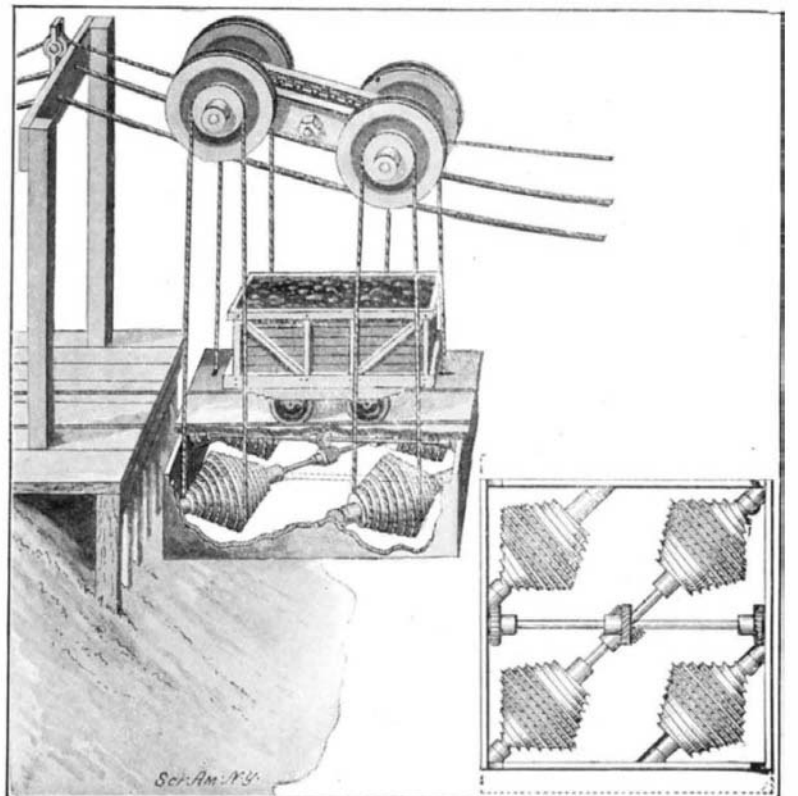
The greatest strain on a railway track comes at the joints, and it is rather an unfortunate circumstance that the parts which are subjected to the greatest strain must be weakened by bolt-holes necessary for securing the fish-plates. A recent invention, however, provides a very efficient means of securing rails to each other and to the roadbed at the joints, and at

**IMPROVED RAILWAY CHAIR.**

other places as well, without the use of any bolts. Our engraving illustrates this invention, which is to be accredited to Rev. Francis W. Pool, of Havre, Mont. This improved railway chair comprises two identical members of the form shown in our detail view. Each member is formed of a metal plate with two upwardly projecting jaws thereon. The larger one of these jaws is provided with a lateral projection which is tapered along its outer face to lie parallel with the beveled or tapered inner face of the smaller jaw. In use the two members are placed under the rail, parallel to each other, but at right angles to the rail, so that the large jaw of one member will lie against one side of the rail, and the large jaw of the other member will lie against the other side of the rail. Now, on moving these members together, it will be observed that the taper face of the smaller jaw on each member engages the tapered projection of the larger jaw on the other member and serves as a wedge to tighten its grip on the rail flange and web. When the members have been tightly driven into engagement with each other, and the rail, they are held in place by spikes driven into the ties.

COMPENSATING DEVICE FOR ROPE TRAMWAYS.

By means of a very ingenious arrangement of compensating drums, Mr. William Y. Cruikshank, of Free-land, Pa., has produced an overhead traveling carriage for use on suspension cables stretched across rivers and the like, which will travel in horizontal position throughout its course, and which will furthermore act as a brake on the down grade, and as a power to assist the propulsion on the up grade of the cableway. The greater the load carried, the greater will be the down-grade friction and the up-grade power developed. As shown in our engraving, the carriage consists of a platform supported on a frame, in which the compensating drums are journaled, and from the latter, endless

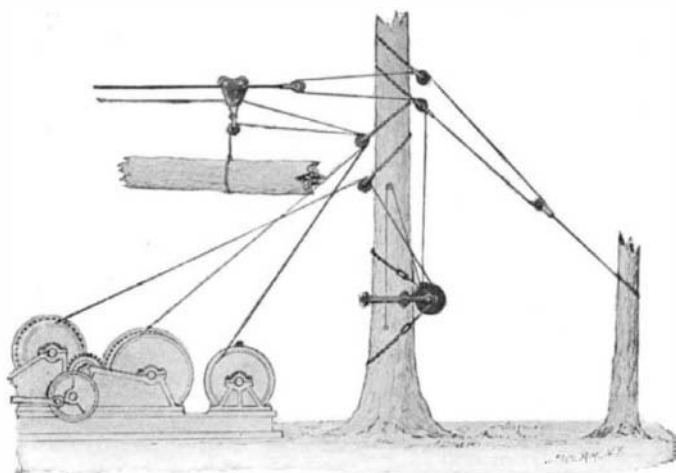
**COMPENSATING DEVICE FOR ROPE TRAMWAYS.**

ropes pass upward over pulleys formed on the wheels which travel on the cables. The compensating drums are of a double cone shape, and are spirally grooved to receive the coils of the ropes, the number of coils on each drum being equal to one-half the number of turns of the spiral groove. The compensating pulleys are disposed at an angle with the axes of the cable wheels, for the purpose of holding the ropes at all times in alinement with the pulleys. When the carriage is in motion, the pulleys rotating with the cable wheels cause the ropes to unwind from one-half of each compensating drum and onto the other half. On the ascent, each rope unwinds one strand toward the drum's greatest diameter, when the other strand winds onto the drum's smallest diameter. As the carriage ascends, the grade is constantly increasing, and the purchasing power is in the same ratio increasing in favor of the strand that is unwinding toward the greatest diameter of the drum. This power is transmitted to the pulleys, and assists in revolving the cable wheels, thereby assisting in propelling the carriage up grade. The reverse holds true on the down grade. That is, the carriage is raised toward the cable wheels on the down grade at a gradual rate and then lowered on the up grade at an accelerated rate. By varying the positions of the rope coils on the forward and rear drums, it is evident that the forward end of the platform may be made to rise more slowly than the rear end on the descent, and *vice versa* on the ascent, thus keeping the platform in horizontal plane.

As the ropes wind on and unwind from the drums there will be a lateral movement of the carriage, and in order to keep the center of gravity of the load at the same point, a compensating movement is provided as follows: A rack formed on each end of the platform is engaged by a pair of spur gears secured to a shaft, which is rotated by worm gear connection with a pair of the compensating drums, as shown in our detail view.

A TENSION REGULATOR FOR OVERHEAD CABLES.

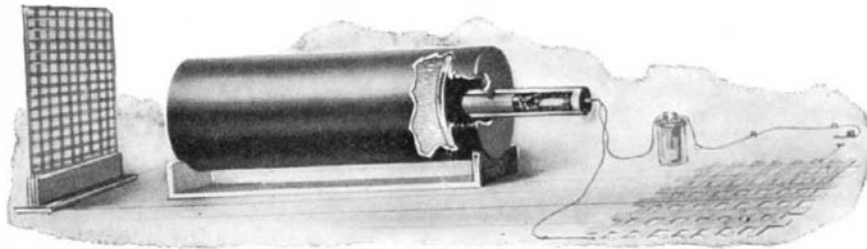
The accompanying illustration shows a new tension regulator invented by Messrs. John F. McKay and David J. McKay, of Bowie, La., which is adapted particularly for regulating the tension of overhead cables used in lumber camps for transporting logs through the forest from place of felling to the railroad. The improved apparatus is capable of safely manipulating cables of the largest size and greatest length, and will permit of rapid change when it is desired to shift the position of the cable lines. It will also relieve the strain on the hoisting drum after the cable has been placed under a desired tension. It will be observed from our illustration that the main cable is secured to the strap of a running block which may be adjusted toward or away from the supporting tree by means of a tension cable which, through suitable tackle leverage, is connected to a tightening drum. The tension cable is fastened at one end to the strap of a standing block secured to the supporting post or tree, and thence passes in succession over a tail block secured to an anchor post or stump, a second guide block secured to the tree, the block on the main cable, and back to the first standing block, over which it passes to the tightening drum. The latter is supported in a U-shaped frame, provided with two arms which extend on either side of the supporting tree, and which may



A TENSION REGULATOR FOR OVERHEAD CABLES.

be firmly secured thereto by means of a chain and a locking hook. The device is further strongly braced by guy chains, as shown. The tightening drum is formed with two barrels, the smaller one to receive the tension cable, and the larger one for a second cable, wound in the opposite direction, which passes to the winding drum of the skidding engine. When the latter cable is wound up on the winding drum, it rotates

a tightening drum and thereby places a tension on the main cable. A dog engaging a ratchet on the tightening drum takes the strain of the tightening cable when the drums are at rest. A most important feature of the invention resides in the manner of securing the blocks and cables to the tree, whereby the probability of an accident due to the falling of any portion of the overhead structure is almost entirely avoided, thus eliminating to a large extent the danger

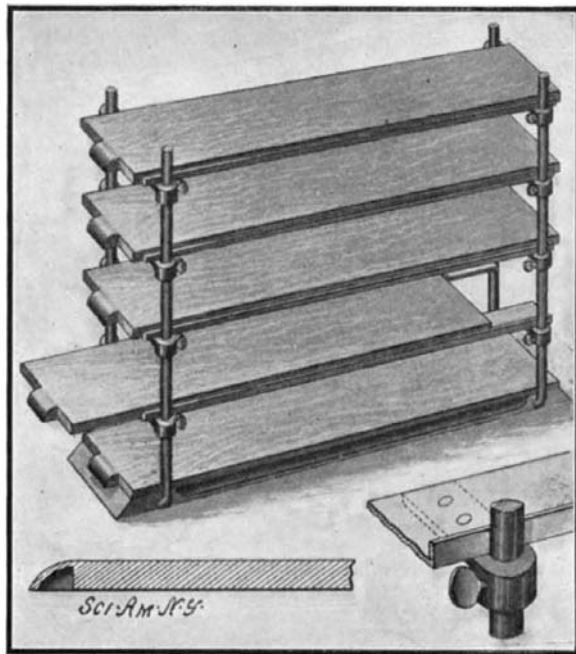


DEVICE FOR DISTRIBUTING NOXIOUS FUMES.

heretofore incident to work in the vicinity of overhead structures.

A CLOTHING RACK.

In clothing stores considerable confusion is apt to arise from the promiscuous piling of clothing of all sizes on the same counter or table. This confusion is usually the result of a lack of suitable storing facilities. In order to ameliorate such conditions, Mr. John A. Hockersmith, of Norfolk, Nebraska, has invented an improved clothing rack of simple construction,



TROUSERS RACK FOR CLOTHING STORES.

in which trousers of different waist and inseam measurement may be placed and separated as to sizes, thus making it convenient to quickly find a garment of any desired size. As shown in our illustration, the trousers rack consists of two U-shaped rods, which form the uprights on which the shelves are supported. The horizontal portions of the uprights fit into grooves in the bottom of the baseboard, and are secured thereto by screws. Brackets are adjustably mounted at desired intervals on the uprights, to which they are secured by the tightening of thumb screws. Rigidly connected to opposite brackets of a side are flanged plates, on which the shelves are mounted to slide. Each shelf is formed with a handle at one end, and on these handles different sizes of waist and inseam measurements may be placed. An important feature of this improved rack is the fact that the space between the shelves may be varied at will, according to the quantity of clothing which is to be carried by the shelves.

William F. Oesterle, who recently graduated from the Indiana University, and O. W. Brown, an assistant of chemistry at the same institution, have invented a process of smelting ore by electrical means which is said by them to represent great economy over the present method of doing this work. Instead of the cumbersome clay retorts now in vogue around smelting works, these gentlemen make use of a furnace of their own design, and the metal runs out in streams while the ore is being treated. The roasting of the ore, now a source of considerable expense, will be entirely done away with, and an enormous saving of labor will result. Mr. Oesterle says that with his furnace four men will produce as much ore in a given time as one hundred men now do. Mr. Oesterle is thoroughly familiar with the subject, as his father has a large zinc plant at

Marion, Ind. This invention was begun while the junior Oesterle was attending the high school, and he took a special course at the Indiana University in electro-chemistry for the purpose of completing the details of the process. Here he confided his plans to Mr. Brown, and since they have worked together.

DEVICE FOR DISTRIBUTING NOXIOUS FUMES.

The usual type of burglar alarm is arranged to sound an electric gong and arouse the occupants of a room or building on entrance of a burglar, but such an alarm obviously affords little, if any, protection for isolated buildings such as country stores, or the like, which are unoccupied during the night. For such buildings, what is needed is a device which will cope with the intruder himself, and not merely sound an alarm. We show herewith the method of dealing with such a case invented by Mr. Lyman M. Beckes, of 609 Main Street, Vincennes, Ind. It consists in a means for distributing noxious fumes in a room or building on entrance of the burglar, so as to overcome the man and prevent him from carrying out his unlawful designs. The noxious material, which preferably consists of formaldehyde, is held in a light steel cylinder, closed by a cork at one end and by a wall at the other. A small tube closed at its outer end is threaded into this wall, and serves as a holder for a charge of gunpowder. A plunger in the cylinder is formed with a shank which fits into this tube against the powder. A fine heating wire inserted into this charge is connected in series with an electric battery circuit. The circuit, however, is normally open, but is so arranged that by stepping on a door mat or in some similar way, the burglar will complete the circuit, igniting and exploding the charge, which will force the plunger and cork out, and discharge the formaldehyde. By arranging a screen before the muzzle of the cylinder the material on striking the meshes will be considerably diffused, and the rising fumes will make it impossible for the burglar to remain in the room and retain consciousness.

AN IMPROVED PORTABLE TENT.

We illustrate herewith an improved portable tent which is light and roomy, very strong and durable, and capable of erection very quickly in a storm-proof and reliable manner, either on rocky, sandy, or loam soil. The use of ridge poles, upright and inclined posts, and the numerous belaying pegs usually employed is entirely dispensed with, and in their place a pair of detachable frame arches and several anchors are used. Each frame, as shown, is made up of two straight and two curved wooden sections, and is braced by a rod formed at the ends with pins, which fit into sockets in the ends of the frame. The frame sections are held together by metal socket pieces or couplings. In erecting the tent, the two frame arches are spaced apart at a suitable interval, and the tent cover is drawn over them. This covering is made with strapped seams, and is approximately semi-cylindrical in shape, with tapered ends, as illustrated. The latter are secured by pegs driven into the ground, and guy ropes extend from the top of the frame arches to a suitable anchorage on each side of the tent. If the tent is erected on rocky ground, a hook may be used to anchor the guy ropes, but in sandy ground the anchor is formed of a metal plate, from the periphery of which



IMPROVED PORTABLE TENT.

several wire strands extend to a common ring, to which the guy rope is secured. The tent covering is formed along its edge with an outwardly-extending flange, and the door of the tent opens into one or both of the tapered ends. Curtains separate the main body of the tent from these tapered ends. The inventor of this improved tent construction is Mr. Frank H. Gotsche, 416 Hoffmann Avenue, San Francisco, Cal.