Patent Department

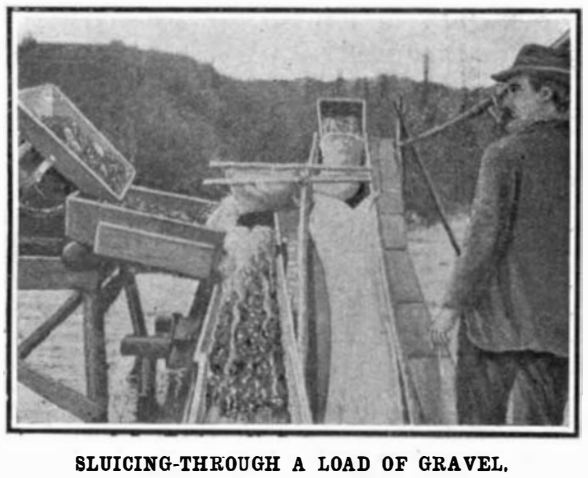
MODERN USE OF AN ANCIENT INVENTION.

People living in sparsely-settled or frontier regions, and who are denied many of the luxuries of modern civilization, would profit by studying the simple but ingenious expedients which went to make up the civilization of the ancients. One of the readers of the SCIENTIFIC AMERICAN, in the gold regions of Alaska, has thus profited by his acquaintance with ancient hydraulics. Mr. J. M. Weldon is a placer miner, and in his work requires some means of raising water for washing the gold-bearing gravel. At the Forty-Mile River, where Mr. Weldon is conducting his operations, it is entirely impractical to convey the water by ditch from some higher level, because the river bottom lands are underlaid with glacier ice. Several attempts were at first made to thus convey the water, but no sooner was the water turned into the ditch than it melted a hole in the bottom and ran out. Hole after hole was flumed across, but still the water found its way through the ice bottom. It was then that Mr. Weldon bethought himself of a primitive pump which he had seen pictured in one of his early school books. The pump consisted of a gutter or trough mounted to rock like a seesaw in a stream or other body of water, so that the ends would alternately be submerged, and on rising would deliver the water they scooped up to a trough leading from the fulcrum of the pump. This apparatus offered a promising solution of the difficulties at Forty-Mile River, for with it the necessary water for sluicing could be raised directly from the river wherever desired.

RAISING WATER WITH A SEESAW PUMP.

The pump was built on a point which jutted out into the water. As shown in the engravings, a framework is erected at the end of this point. Mounted to rock on the framework is a beam 22 feet long, provided with a large scoop at each end. The scoops consist of open boxes provided with valved bottoms, which permit them to fill as soon as they touch the water. The boxes are tilted inward, or toward the center of the beam. The inner end of each box opens into a 10-inch canvas hose, which conducts the water to the sluice box. To rock the beam the operator walks back and forth upon it, applying his weight first to one and then to the other side of the fulcrum, as shown in the illustration. To facilitate this operation the beam is floored with boards, and a hand rail is provided which is supported by a pair of tripods erected in the river. The scoops take up about 20 gallons of water at each lift, and raise it about 4½ feet higher than the head of the sluice box. A hopper is provided at the head of the sluice box, and leading to this is a gang plank for the wheelbarrows in which the gold-bearing gravel is conveyed.

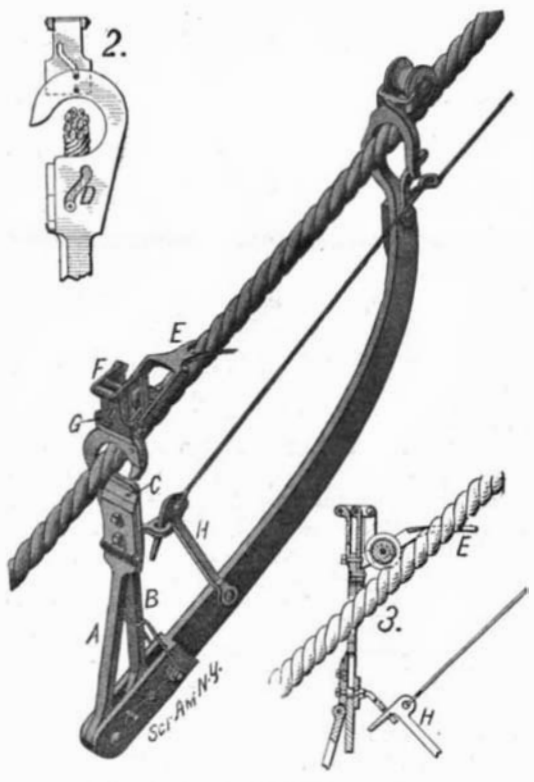
Mr. Weldon operates the apparatus alone, first loading the hopper with four wheelbarrow loads of gravel, and then rocking the beam until the entire charge is sluiced through, the tailings being washed out into the river. Several times he has had to dismantle the apparatus and draw it up on high ground, owing to high water, but the task of rebuilding it was not a very serious one. With this primitive pump, Mr. Weldon claims that one man can sluice through as much as two men can dig and shovel into the hopper.



SLUICING-THROUGH A LOAD OF GRAVEL.

IMPROVED CABLE-CUTTING DEVICE.

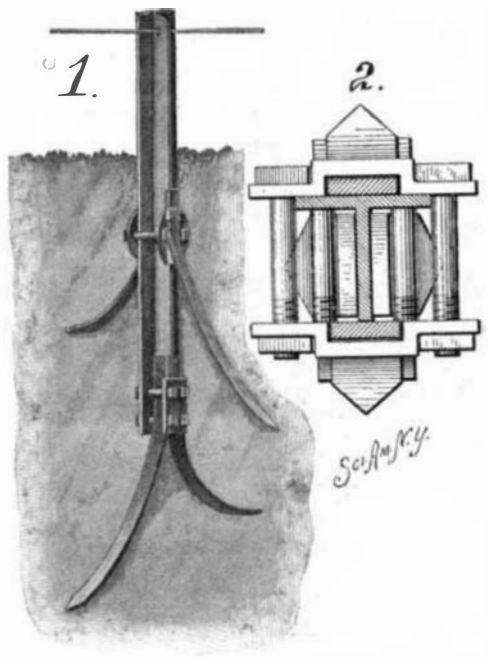
Pictured in the accompanying engraving is an improved device adapted for cutting ship's cables at any point along their length. It consists of a frame mounted on rollers, which are hooked over the cable. The frame is adapted to travel down the cable to any desired point, whereupon, by the pulling of a cord, a pair of knives are operated to sever the cable. As shown in Fig. 1, the forward end of the frame carries two levers, *A* and *B*, whose fulcrums are separated by a short space. Hinged to the upper end of lever *A* is a plate, which carries a knife blade *C*. This plate is connected to lever *B* by means of a bolt, which passes through a slot *D* therein. The upper end of lever *B* is formed with a hook, which passes over the cable. Connected with this hook is a fork or a dog *E*, which rests against the cable. Now, if the frame be drawn back up the cable by means of a cord, the dog *E* will engage the cable, arresting the upper end of lever *B*. The levers *A* and *B* will then be swung on their fulcrums, forcing the knife blade *C* to cut through the cable. To assist in this cutting action the slot *D* is curved, as shown in Fig. 2, so as to give a shearing motion to the knife blade. In addition to the blade *C* an upper blade *G* is provided, which is connected by links *F* with the dog *E*, in such manner that when the frame is drawn upward, the knife will move down to assist in severing the cable. This knife is also given a shearing motion, by means of a curved slot therein, which is engaged by a fixed bolt. To prevent the knives from operating under normal conditions, a spring bears against the lever *B*, holding it in inactive position. In addition to this a hook *H* engages an eye on this lever. The cord by which the knives are set in action is attached to this hook, so that when it is pulled taut the hook will be disengaged from the lever, permitting the parts to operate. The inventor of this device is Mr. Charles Petrie, Office of the Government Engineer, St. Johns, Newfoundland.



IMPROVED CABLE-CUTTING DEVICE.

ANCHORING DEVICE FOR POSTS.

The anchoring device which is herewith illustrated is particularly adapted for use on metal fence posts. Briefly stated, it comprises a series of prongs so mounted that when they are driven down they curve outward and are imbedded into the ground on all sides of the post, thus holding the post firmly in upright position, even when subjected to severe lateral strain. Each post is supplied with an upper and lower set of anchoring prongs, the two sets being at right angles to each other. The fence post is T-shaped in cross-section, consisting of a head with a central web or flange. A plate is secured to the lower end of the post against the outer edge of the flange by means of two upper and two lower bolts, which pass through the head of the post. Resting against opposite faces of the flange, between the head and this plate, are two anchoring prongs, which consist of narrow plates of metal pointed at the lower ends. The prongs pass under the upper bolts, but their points curve out over the lower bolts, so that when they are driven downward they will spread outward, as shown in the engraving. At a convenient point above the lower prongs a pair of straps are bolted to the post. These are bent to form sockets, in which the upper pair of prongs are seated, as best shown in the section view. The straps are framed with offsets, which cause the points of the prongs to curve outward. As stated above,



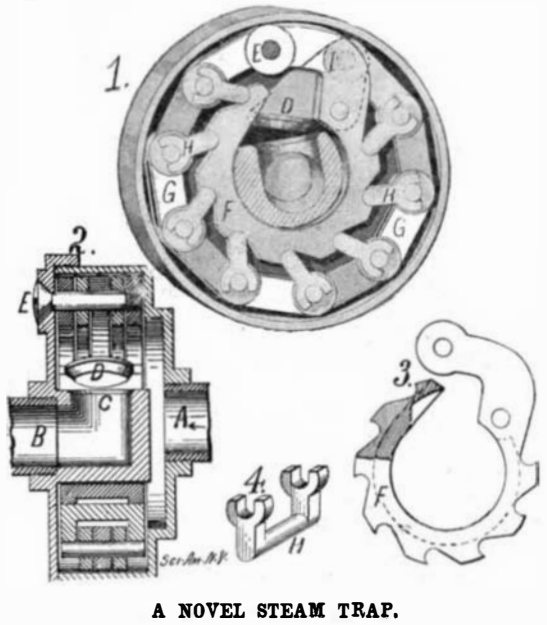
ANCHORING DEVICE FOR POSTS.

these prongs are set to spread at right angles to the lower prongs. In practice the post is driven or sunk into the ground, and then, with a suitable instrument, the prongs are driven down, when they will assume the positions shown in the engraving. The inventor of this improved anchoring device is Mr. Percy T. Bailey, Melville Station, Newport, R. I.

A NOVEL STEAM TRAP.

The purpose of a steam trap, as is well known, is to permit the flow of water while arresting the escape of steam. Usually this is accomplished automatically by means of thermostatic devices, which operate to close a valve when the temperature rises with the presence of steam in the trap. The trap which is herewith illustrated belongs to this same general class, but the method of applying the thermostatic principle is decidedly unique.

As shown in the cross section, Fig. 2, the trap is fitted with inlet and outlet pipes, *A* and *B* respectively. Communicating with the outlet *B* is a valve seat *C*, in which the valve *D* is adapted to be seated. The valve *D* is carried by a lever that is fulcrumed to an expansion collar *F*. This collar, as best shown in Fig. 3, is split and is formed at the sides with notched flanges. One end of the collar is formed with an arm, which is fastened to the casing of the trap by means of an eccentric pin *E*. This pin also serves to hold one end of an expansion chain *G*, the opposite end of which is attached at *I* to the lever that carries the valve *D*. Seated loosely in the notches of the expansion collar *F* are a series of U-shaped rockers *H* (Fig. 4) whose forked ends engage the pins that join the links of the expansion chain. Fig. 1 shows the normal position of the parts, when the water is free to flow from inlet *A* through valve seat *C* to outlet valve *B*. After the water has escaped and steam begins to flow into the trap, the collar *F* and chain *G* will expand with the increase of temperature; and as they are both secured to the casing at *E*, the expansion will take place in opposite directions. The rockers will then swing inward, or toward the expansion collar, permitting such elongation of the chain as will seat the valve *D*. The relative positions of the various parts

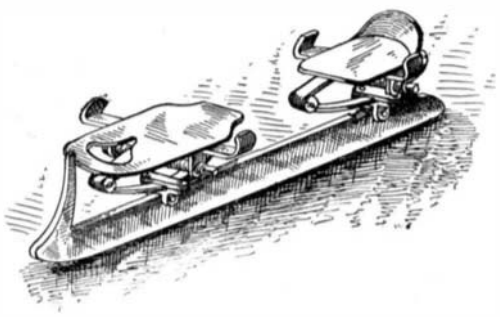


A NOVEL STEAM TRAP.

may be adjusted by turning the eccentric pin 20. The inventor of this novel steam trap is Mr. John Langridge, 108 High Street, Ramsgate, England.

ODDITIES IN INVENTION.

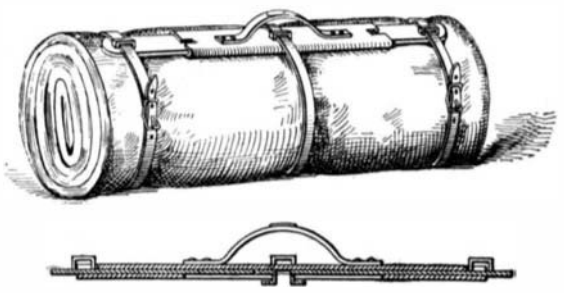
Spring Skate.—A novel improvement in skates has recently been invented by a resident of Troy, N. Y. In place of rigidly securing the skate blade to the foot-plate, the plates which support the heel and ball of the foot are separately mounted on springs. The forward spring is rigidly secured to the skate, but the rear spring is adjustable to several positions, in order to accommodate it to different sizes of shoes. Ordinarily



SPRING SKATE.

springs are used to cushion shocks and jars, but no such reason is argued for equipping skates with springs. Instead the springs serve to provide a certain flexibility that is impossible with the present rigid form. With such skates the skater can glide through various figures with much greater ease and freedom, and he will find the recreation less tiring, because he can move his foot at will, shifting his weight from the heel to the ball of the foot.

Extensible Shawl Strap Bar.—One of the objections to a shawl strap as heretofore made is the fact that it is not adaptable to all sizes of bundles; the shawl strap bar being of fixed length serves as a limit to the length of the bundle upon which it may be used. To overcome this objection an Australian inventor has recently devised an extensible shawl strap bar which may be adjusted to any desired length. The



AN EXTENSIBLE SHAWL STRAP BAR.

method of accomplishing this result is clearly illustrated in the accompanying engraving, and will be understood at a glance.

Some Novel Types of Matches.—Pictured in the accompanying engraving are several novel types of matches. A flexible type of these is represented in Fig. 1, which shows a strip wound up into a roll. The strip is lapped, and provided with igniting means at regular intervals. When it is desired to utilize a match the roll is grasped, the strip is pressed just above a lap, and the projecting end of the strip is pulled. A separate edge view is given of this lap or fold, which consists of a lapped-over portion adhering to the main part. The fold under its right end is supplied with a rubbing surface. The left end of the adjacent surface is provided with an igniting compound, which when brought into contact with the rubbing surface is ignited by friction. This does not claim to be a safety match. Fig. 2 shows an excellent device in the form of a match box. On inverting it one of the combustible pellets in the box readily passes into the neck and enters the cap. The latter is cut away so as to expose the top side of the pellet to contact with a rough surface for purposes of ignition. The pellet enters on moving a slide valve inward against spring tension. This valve on its return to normal position supports the pellet within the cap. The pellet can be ignited by drawing it across any roughened coating, and the highly-inflammable center of the combustible compound will burn for some time. The draft perforators in the cap assist the combustion.

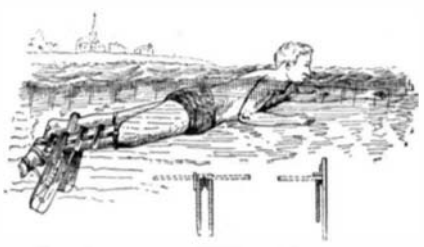
In Fig. 3 we have a match strip folded in zigzag or accordion pleat before being finally compacted, as shown. It is fastened with a rubber band, which keeps the match sticks in compact position. A detonating substance on one stick comes over a plain surface of the next, and just below on the adjacent stick the igniting material is placed, as shown in the smaller sketch. On pulling the match stick, the detonating compound passes over and rubs against the igniting substance of the adjacent stick. Ignition occurs under the frictional contact produced by the band, and when the match stick is rapidly pulled from the pack it is ready for use. The detonator and igniter are never in contact when within the accordion folds.

The possibility of lighting a match or fusee with one hand while the other is engaged is made easy by the simple mechanism illustrated in Fig. 4. The small section view shows a match in its inside position. The inner surface of one end of the open tube is coated with a surface of sand, glue, or other rubbing compound to ignite the match. The head end and most of the match is inclosed in the casing. Pressing or pushing the protruding end through the tube causes the head to come in contact with the frictional surface of the other end of the tube, where it is ignited and on passing out burns, as shown in the larger engraving. The invention is usable in rainy, windy, or stormy weather, and may be safely carried loosely in a pocket, pouch, or like receptacle.

Another safety match is presented in Fig. 5. It is practically the same as the preceding type. The end occupied by the head of the splint or stick is closed, and the flat extension affords a means for holding the sleeve or casing in the fingers. By closing the outer end fire is retained if the splint is not properly withdrawn. By pulling the splint suddenly from the sleeve an igniting compound of the former is brought into contact with the rubbing compound of the latter, and ignition takes place immediately. Two hands are required in the use of this invention.

A safety match has been invented having an incision nearly at its middle part. The stick will break on a line extending from the inner end of this incision across the match. The surface of the notch is covered with an igniting compound, and is shown in the bottom illustration of Fig. 6. The upper illustration of this figure presents the scratching of the match head on the igniting surface. In this improvement there is neither danger of accidental lighting nor chance of wear to the compound.

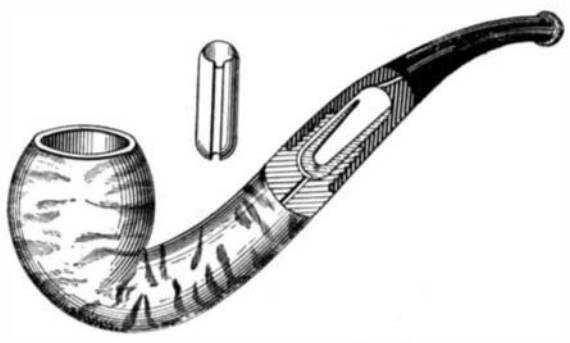
Swimming Appliance.—The accompanying engraving



AN ODD SWIMMING APPLIANCE.

illustrates an attachment which may be secured to the legs of a swimmer to assist him in propelling himself through the water with greater speed than can be accomplished by the use of the natural members of the body. The attachment consists of a pair of wings or blades secured by means of straps to the ankles and feet. The blades are so hinged as to fold when the leg is moved forward, but will straighten out when kicked backward and thus offer a large area of resistance, causing the swimmer to move forward rapidly. Aside from these main blades a series of smaller hinged blades are provided which are attached to straps secured to the legs. These blades are also arranged to open when the legs are moved backward, but fold back when the legs are drawn forward.

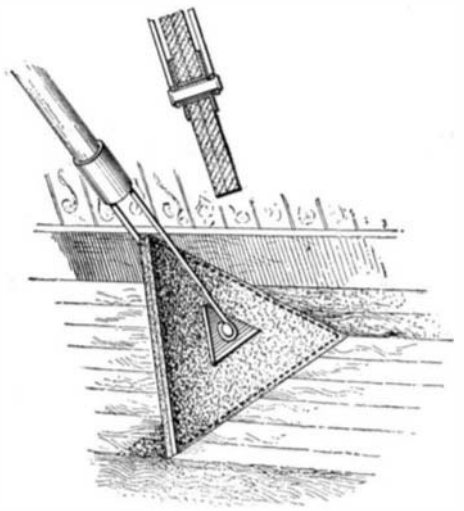
Tobacco Pipe.—Many inventions have been made with a view to preventing saliva from flowing down the



AN IMPROVED TOBACCO PIPE.

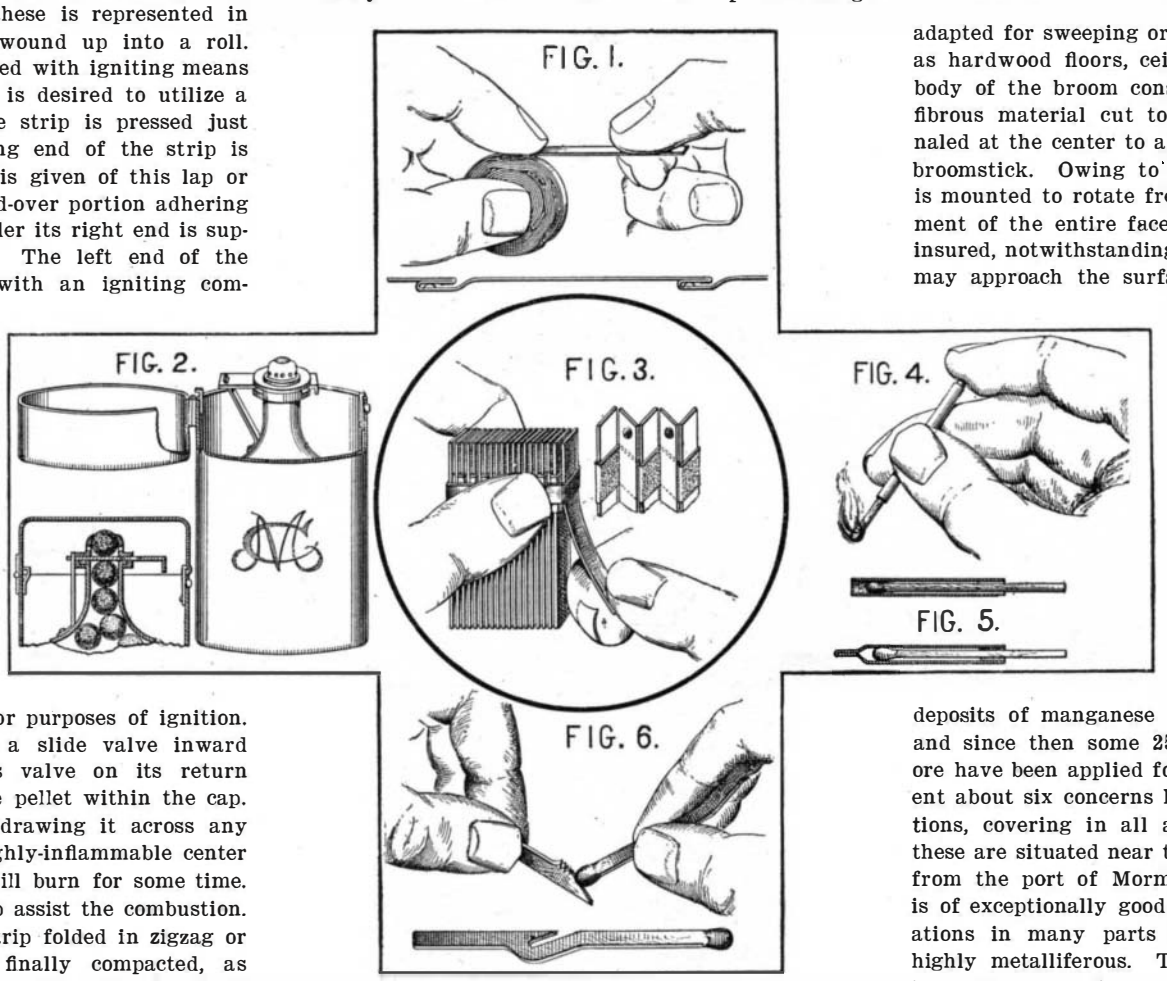
stem of a tobacco pipe and reaching the pipe bowl, and also to prevent the passage of nicotine up the stem to the mouth of the smoker. One of the latest of these inventions is illustrated herewith. The pipe is formed with a detachable mouthpiece, and between the two members an opening is formed in which a receptacle is adapted to closely fit. This receptacle is formed with a groove at its upper side, along which the smoke from the bowl may pass to the mouthpiece. The upper end of the receptacle is open and serves as a trap for the nicotine and saliva. Whenever desired, the mouthpiece may be quickly unscrewed from the bowl section and the receptacle removed and cleaned.

Broom for Cleaning Smooth Surfaces.—A novel broom has recently been invented which is particularly



BROOM FOR CLEANING SMOOTH SURFACES.

adapted for sweeping or cleaning smooth surfaces, such as hardwood floors, ceilings, walls or the like. The body of the broom consists of a number of layers of fibrous material cut to a triangular form, and journaled at the center to a yoke secured to the end of the broomstick. Owing to the fact that the broom body is mounted to rotate freely on its bearing, the engagement of the entire face of one side margin is always insured, notwithstanding the manner in which the body may approach the surface to be cleaned; for if upon bringing the broom against the surface one corner should strike first, the broom body would swing on its axis until the entire margin was brought squarely upon the surface. Owing to the fact that there are a number of sweeping faces to the body the life of the broom is greatly increased.



SOME NOVEL TYPES OF MATCHES.

The British consul at Goa, Portugal, reports that deposits of manganese were discovered early in 1906, and since then some 250 concessions for mining this ore have been applied for to the government. At present about six concerns have commenced mining operations, covering in all about twenty mines. Some of these are situated near tidal water and not many miles from the port of Mormugao. The ore in some cases is of exceptionally good quality. The geological formations in many parts of the country appear to be highly metalliferous. The restrictions regarding mining and prospecting are not onerous, and the taxes on mines and their output are at present light.