

A Remarkable Drainage Enterprise.

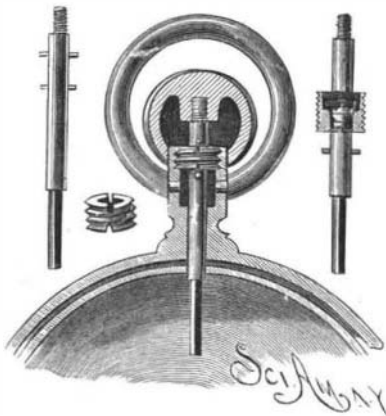
The Russian Government is engaged in one of the most extensive drainage enterprises ever undertaken in any portion of the world. The location is what is known as the Pinsk Marshes, in the southwest of Russia, near the borders of Galicia. This region is so extensive as to secure special designation in the ordinary map of Europe, and, in point of area, is very much larger than Ireland. The marshes have become famous in Russian history as a refuge of all manner of romantic characters, and have remained an irreclaimable wilderness up to within the last two or three years.

In 1870 the Russian Government first took in hand seriously the abolition of this wild expanse, owing to its being perpetually more or less submerged and covered with a jungle growth of forest, preventing not only communication between the Russian districts on either side, but also between Russia and Austro-Germany. A large staff of engineering officers and several thousand troops were draughted into the region, and these have been engaged upon the undertaking since. Up to the present time, about 4,000,000 acres have been reclaimed by means of the construction of several thousand miles of ditches and canals, so broad as to be navigable for barges of several hundred tons burden. Just now the engineers are drawing up the programme for next year, which comprises the drainage of 350,000 acres by means of the construction of 120 miles more of ditches and canals.

Of the 4,000,000 acres already reclaimed, 600,000 acres consisted of sheer bog, which has been converted into good meadow land; 900,000 acres of "forest tangle," which have been prepared for timber purposes by cutting down the underwood and thinning the trees; 600,000 acres of good forest land—forest oases in the middle of marshes—hitherto inaccessible, but which have been connected more or less by navigable canals, and thereby with the distant markets; and finally, 2,000,000 acres have been thrown open to cultivation, 120,000 acres of which have already been actually occupied. Besides making the canals and ditches, the engineers have built 179 bridges, bored 577 wells from 20 ft. to 80 ft. deep, and have made a survey of 20,000 square miles of country hitherto unmapped. When the task is finished, Russia will have effaced from the map of Europe one of the oldest and toughest bits of savage nature on the Continent. From an engineering, geological, and scientific point of view generally, the work is one of special interest.

PENDANT STEM FOR WATCHES.

The stems of self-winding and hunting-case watches are usually held in place in the pendant by a screw entering a circumferential groove in the stem, or a grooved collar placed on the stem. Both the screw and collar are apt to become worn, and the screw being small is weak and liable to be broken. In the construction shown by the three left-hand views of the annexed engraving, the pendant is internally threaded to receive a collar, into which fits the stem, which passes through the pendant to the winding and setting mechanism. The collar is provided with notches in its outer and inner surface, to receive pins passing through and projecting from the stem. The stem may be freely turned to wind or set the watch, as the pins are normally out of contact with the collar. The collar is carried to its place by bringing the upper pin into engagement with its notch, and may be removed by bringing the lower pin into contact with its own notch. In both cases the

**SCHIMMEL'S PENDANT STEM FOR WATCHES.**

stem and collar will turn together to screw or unscrew the collar.

In the construction shown in the right-hand view, the stem is formed with an enlarged part, beveled upon each side, and encircling which is a split steel ring which enters a recess formed in the threaded collar. Normally, the enlarged part of the stem is below the ring, so that the stem may be used for winding the watch. When the enlarged part has been pulled through the ring and rests above it, the device is arranged for setting the watch. It will be seen that this construction, while being strong and durable, prevents the entrance of dust or moisture to the interior of the watch.

This invention has been patented by Mr. F. W. Schimmel, of Murray, Idaho.

FLEXIBLE SCRAPER.

To the end of the handle is secured a concave board, having its opposite edges curved. To the back of the board are secured metallic sockets for receiving braces, which are held in sockets secured to the handle. This construction insures both strength and lightness. To the concave face of the board is attached an oblong sheet of rubber, whose edges project beyond the edges of the board, so that when the scraper is used only the rubber will be presented to the floor or surface being cleaned. By applying the scraper to the floor at the proper angle, the entire edge of the rubber sheet will be brought in contact with the floor, and as the scraper is moved forward its concave form will cause it to re-

**KAE LIN'S FLEXIBLE SCRAPER.**

tain most of the water it gathers up, and to carry it forward.

This invention has been patented by Mr. Albert J. Kaelin, whose address is Germania House, Houston, Texas.

A New Submarine Boat.

The question of submarine warfare would appear to be advanced an important stage by a new submarine torpedo boat which was lately tried in the West India Docks, London. The great problem for solution in this class of boat is a simple and ready means of effecting submersion quickly and of again rising to the surface as frequently as may be desired. Many attempts have been made to compass this object by means of screws, inclined planes, water compartments alternately filled and emptied, and other contrivances. The present invention, however, involves none of these principles. The principle upon which the immersion and emersion of the new boat depend is simply that of displacement.

While lying on the surface, the boat has a given amount of displacement. To effect immersion, this displacement is reduced; and when it is desired to raise her to the surface again, the displacement is increased. A fair analogy is that of a telescope dropped into the water when extended for use, in which condition it will float for a given time. If dropped into the water closed up, it will straightway sink to the bottom. The idea of utilizing this principle originated with Mr. Andrew Campbell, and was worked out in practice by him in conjunction with Mr. Edward Wolesley and Mr. C. E. Lyon, and the vessel in which the joint ideas of these gentlemen have been embodied has been built by Messrs. Fletcher, Son & Fearnall, of Limehouse.

This boat is cigar-shaped, and pointed at both ends, being 60 ft. long and 5 ft. in diameter amidships, exclusive of a slightly raised central deck. Her displacement when fully immersed is about 50 tons. She is built of $\frac{3}{4}$ in. Siemens-Martin steel and is driven by twin screws, the motive power being electricity, which is supplied from a storage battery to motors of 45 horse power. Electricity also supplies light, when submerged, by means of glow lamps. Air under pressure is stored on board, and there is accommodation for a three days' supply; the electrical batteries also have a similar storage capacity. The electrical machinery has been designed by Mr. Graydon Poore, and supplied by Messrs. Lewis Orlick & Co.

When lying on the surface of the water, a depth of only about ten inches of the central upper portion of the boat is visible above water line, and this is surmounted by a steel conning tower about 12 in. high and 15 in. diameter and pierced with four sight-holes. Entrance and exit are obtained by means of a manhole on the deck, which is secured with a watertight joint, and there is room for six persons in the central portion of the boat. Displacement is increased or reduced by means of cylindrical chambers which are projected or withdrawn telescopically from the sides of the vessel, and by this simple means she can be made to rise or fall in the water, slowly or quickly, at the will of those in command.

This was amply demonstrated recently, when Lord

Charles Beresford, with others, went down in her, Lord Charles expressing himself very strongly as to the value of this new vertical maneuvering power. The boat was many times submerged to the bottom of the dock, about 17 ft., and brought to the surface again on a perfectly even keel. She was also propelled a short distance, connection being made with the batteries by hand, but as the motors were coupled up with the current, nothing further was attempted. The area for a run, moreover, was too circumscribed, there being a number of vessels lying in the docks, which would have impeded progress.

The main application of the system would appear to lie in the direction of submarine warfare, although it is not intended that it shall subserve this purpose exclusively, as the inventors have designed arrangements for applying it to all classes of submarine operations in lieu of the diving bell. It is also to be observed that, although only applied to a 60 ft. boat, this size in no way indicates a limitation of the principle, which can be applied to any sized vessel. The present dimensions were only adopted because they correspond to those of a second-class torpedo boat. The invention appears to be one of much merit, and well worth the attention of the government, which it will doubtless receive.—*London Times.*

A Pocket Camera.

An English paper says Councilor W. J. Lancaster, of Colmore Row, London, has a very remarkable photographic apparatus, to be used for detective purposes or ordinary portrait photography. The apparatus is inclosed in a watch case, which opens in the ordinary manner by means of a spring. As the case opens, a miniature camera shoots out for a moment, shuts up again, and the thing is done. The sensitive plates to be used for the camera are miniature dry plates, and a store of these is to be carried by the operator in a specially prepared locket to hang on the watch chain. We understand that the miniature apparatus has been very eagerly welcomed by the detective police, and that the authorities at Scotland Yard have decided to make extensive use of it. A detective who wishes to secure the portrait of a suspected character will only have to get close to his subject, and pretend to pull out his watch and look at the time, and the features will be registered. We may mention that for the sake of experiment, accurate and "speaking" likenesses were taken of a large number of the persons who mixed in the crowd at the recent Socialists' meeting.

IMPROVED CULTIVATOR.

When grain is planted by the so-called "combined lister and drill," the listing forms a ditch or furrow several inches deep, in which the seed is deposited. The drawback to this listing is due to the fact that close to the edges of the furrow on each side, a row of weeds springs up, which, with ordinary cultivators, it is impossible to exterminate, and at the same time cultivate the soil at the bottom of the furrow. The object of the invention here shown, which has been patented by Mr. Daniel M. Bourne, of Cool, Kansas, is to provide a shovel that will cultivate the bottom of the furrow, and at the same time trim the edges of the furrow. The cultivator plow point, or shovel, is provided with a cutter extending obliquely upward and standing above the plow proper, so that while

**BOURNE'S IMPROVED CULTIVATOR.**

the point enters the furrow, the cutter trims the side of the furrow above the point. The point may be rounded or beveled to bring it to a sharp point, and the plow may be made with a shank or be bolted to a separate shank. The wing or cutter extends upward obliquely from the main shovel point, and is slightly twisted to clear itself of trash. Its upper end stands slightly in rear of the body of the shovel, so that the contact of the cutter with the side of the furrow will cause a slight draught and make the shovel penetrate the soil, and tend to steady the cultivator. The shovel can be attached to either a riding or walking cultivator, and has nothing to do with any outside shovels, as the operator can use any kind he desires or can take them entirely off.