were European masons and other skilled men. Mr. Wilfred Stokes, chief engineer and managing director of Messrs. Ransomes & Rapier, was responsible for the detailed designing and manufacture of the sluices and lock gates; 140 of the sluices are 23 feet high by 6 feet 6 inches wide, and 40 of them half that height; 130 of the sluices are on the "Stoney" principle with rollers, and the remainder move on sliding surfaces. The larger of the Stoney sluices weigh 14 tons, and are capable of being moved by hand under a head of water producing a pressure of 450 tons against the sluice.

There are five lock gates, 32 feet wide, and varying in height up to 60 feet. They are of an entirely different type from ordinary folding lock gates, being hung from the top on rollers, and moving like a sliding coach house door. This arrangement was adopted for safety, as 1,000,000,000 tons of water are stored up above the lock gates, and each of the two upper gates is made strong enough to hold up the water, assuming the four other gates were destroyed.

When the river is rising the sluices will all be open, and the red water will pass freely through, without depositing the fertilizing silt. After the flood when the water has become clear, and the discharge of the Nile has fallen to about 2,000 tons per second, the gates without rollers will be closed, and then some of those with rollers; so that, between December and March the reservoir will be gradually filled. The reopening of the sluices will take place between May and July, according to the state of the Nile and the requirements of the crops.

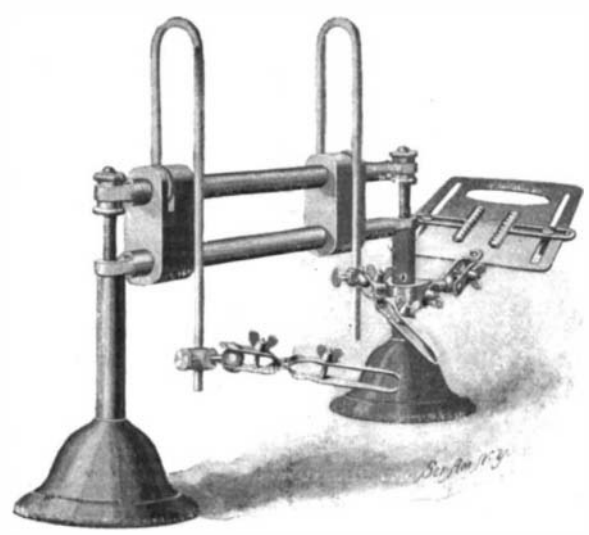
Between December and May, when the reservoir is full, the island of Philæ will in places be slightly flooded. As the temples are founded party on loose silt and sand, the saturation of the hitherto dry soil would cause settlements and no doubt injury to the ruins. To obviate this risk, all the important parts, including the well-known Kiosk, or "Pharaoh's bed," have been either carried on steel girders or underpinned down to rock; or, failing that, to the present saturation level. It need hardly be said that, having regard to the shattered condition of the columns and entablatures, the friability of the stone, and the running sand foundation, the process of underpinning was an exceptionally difficult and anxious task.

At present it is impossible to estimate the far-reaching beneficial influence these irrigation works will bestow upon Egypt, but the reclamation of so many thousands of acres of desert for agricultural development cannot fail to improve the agricultural possibilities of the land and assist Egypt to regain the prosperity it enjoyed in the era of the Pharaohs.

UNIVERSAL WORKHOLDER.

The intricate and delicate work of the jeweler's art may be greatly simplified by the employment of the universal workholder, such as the one herewith illustrated. This device, which is the invention of Messrs. Everett G. Couch and Nelson D. Wells, of Southern Pines, N. C., permits of the finest adjustments and will securely hold the material to be operated on in any desired position.

In the construction of the device two standards are employed, having their upper ends reduced and threaded. Supported on these threaded ends are two parallel bars, on the upper one of which a screw-thread is cut. Movable on these rods are two carrier blocks, each provided with a nut which engages the thread on the upper rod and by means of which the blocks may be given a lateral adjustment. Slight vertical adjustment may be had by operating the nuts on the standards, and thereby raising or lowering the threaded rod. A U-shaped wire arm secured to each block forms a support on which the joint block of the tweezers is mounted to slide. The tweezers have a ball-and-socket connection with the joint block, so that they may be secured at any desired angle by the manipulation of a thumb-nut, and they may also be secured at any height on the wire arm by tightening a thumb-screw in the joint block; thus an unlimited variety of angles may be obtained.



UNIVERSAL WORKHOLDER.

The value of the device will be readily appreciated by the jeweler. The delicate horizontal adjustment permits a joint when made to be opened for the insertion of solder and closed again without the slightest variation. If desired, the tweezers may be moved apart sufficiently to be swung in line with each other, so that a successful butt-end joint of the smallest gold wire can be made. Additional tweezers may be easily mounted where required.

Adjustable on one of the standards is a clamping block to which a plate is secured by a ball-and-socket joint. Near its outer end this plate is provided with an opening in which a small receptacle may be placed for heating water, a lamp being situated underneath the same. Since the plate is attached to the standard by a universal joint, it will be found useful for holding charcoal, against which the work held by the tweezers may be placed while soldering. The charcoal is held between toothed jaws having slotted shanks which permit adjustment for the varying widths of charcoal, while the same may be secured at any desired position along the slots at each side of the plate The entire device is characterized by its simplicity of construction which, nevertheless, does not detract from its efficiency for the most varied requirements.

AN IMPROVED KNIFE.

A patent has recently been granted to Mr. Newton E. Putney, of Southbridge, Mass., for an improvement in tools, such as knives, awls and the like having slidable blades or sheaths. The invention provides a tool of this type which can be readily manipulated with one hand to bring the blade into active cutting position or to conceal the same against possible injury to persons coming into contact with it.

IMPROVED KNIFE.

Our illustration shows a knife having this improved construction. The handle of the knife contains a longitudinally-extending recess in which a metal lining, *C*, is fitted. This lining, which is tubular in shape, is contracted at the inner end so as to be engaged by a transverse pin, *G*, secured in the handle. This pin also engages the inner end of the shank, *A*, of the knife blade. The knife blade is normally concealed within a sheath, *E*, having a tubular extension mounted to slide within the lining, *C*. A shoulder is formed on the inner end of this extension against which one end of the coil spring, *D*, presses, the other end resting against the bottom of the lining. The spring serves to move the sheath to its outermost position, concealing the knife blade. When, however, it is desired to use the knife the sheath is moved back and held in this position by a spring catch, *B*, riveted at one end to the knife blade and at the other end engaging the sheath through an opening in the same. A finger piece is provided on the sheath to enable one more easily to uncover the blade; while the spring-catch is so arranged that by slight pressure of the finger it will be disengaged and the sheath will be moved out under spring tension to conceal the blade. The knife will be found very serviceable for use in stores to cut twine, or for use by carpenters and other mechanics; for it may be safely carried in the pocket without danger of cutting the same, and yet may be readily and quickly brought into cutting position.

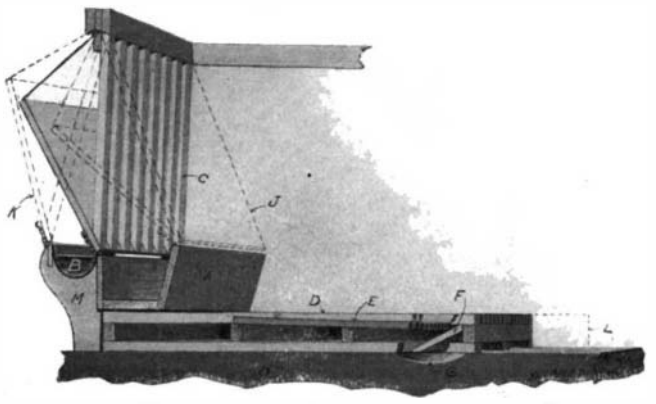
A STALL FOR HORSES OR CATTLE.

In the accompanying illustration we show a new form of stall for horses and cattle which embodies a number of important features. The stall is provided with a movable floor whereby it may be adjusted for animals of different sizes; it is further provided with an adjustable feed-rack mounted to swing over a water-trough and feed-trough so as to cut out one or both of the troughs and permit an attendant to fill them without entering the stall.

The construction of the stall is as follows: The feed-trough, *A*, and water-trough, *B*, are both supported by brackets, *M*. The feed-rack, *C*, which is adapted to hold hay or like food, is swung on pivots in the side walls of the stall and is arranged to just clear the top edges of the troughs. A bolt at the bottom of the rack serves to lock the same in its different positions. The normal position, which is shown in full lines in the engraving, affords the animal free access to the feed-trough, but cuts out the water-trough. When it is desired to fill the feed-trough the rack, *C*, is moved into position, *J*, indicated by dotted line. In order to water the animals the rack, *C*, is moved back into position, *K*.

Resting on the stable floor, *H*, are the floor sections, *B*, which may be moved back into position, *L*, when necessary to accommodate larger animals. These floor sections are provided with channels into which are fitted the strips, *E*, for directing the drainage against the deflector boards, *F*, and thence into a conduit, *G*, formed in the stable floor, *H*. The deflector boards are required more particularly when the floor sections are drawn outward to position, *L*. When it is desired to clean the stable floor the stall floor sections may be wholly removed and thorough cleansing will thus be permitted.

A patent for this construction has recently been granted to Mr. Richard Smith, of Fort William, Ontario, Canada.



ADJUSTABLE STALL FOR HORSES OR CATTLE.

A NEW TYPE OF WATER COOLER.

In these days of sanitary precautions there is an increasing demand for pure drinking water. Physicians have succeeded in teaching the general public the evils of the ordinary ice water cooler, and, as a consequence, a number of improved coolers have been put on the market. Among these is one invented by Mr. Charles F. Conover, of 406-420 East 53d Street, New York city. This cooler is more particularly designed for cooling distilled aerated mineral waters and other liquids contained in large glass bottles. The construction permits of conveniently drawing off the liquid and cooling the same without bringing it into direct contact with the cooling medium. The cooler is provided with a bracket, *F*, extending upward, on which the water bottle or demijohn is supported. The stopper of this bottle is provided with an air-vent pipe, *A*, and a siphon pipe, *B*, the latter being connected by a flexible tube with the outer end of the coil, *C*, resting on the bottom of the cooler. The inner end of this coil leads to a faucet, *G*, through which the water may be drawn off into a tumbler, supported on the drip-pan, *D*. Ice is placed on the coil, *C*, to cool off the water circulating therein. The cooler is provided with a bottom pan, into which the drainage from the ice and from the drip-pan, *D*, flows. The faucet, *E*, connects with this pan and affords the means through which the waste water may be drained off. The flexible connection on tube, *B*, is preferably provided with a device by which it may be closed whenever it is disconnected from the siphon-pipe at the time an empty bottle is being replaced by a filled one. As soon as proper connection with the coil has been made, the siphon action begins; for the level of the liquid in the bottle is above the highest point of the siphon pipe.

This form of water cooler embodies many excellent advantages. Primarily, of course, the water is cooled without being contaminated by contact with the ice. Again, only a small amount of water is cooled at a time, so that when a fresh bottle has been connected up, one does not need to wait until its entire contents have been cooled before obtaining a glassful of cold water. Mr. Conover's cooler will further be found very economical in its consumption of ice. Aside from these, other advantages which our limited space prevents us from enumerating, will readily suggest themselves to our readers.

A NEW FORM OF WATER COOLER.