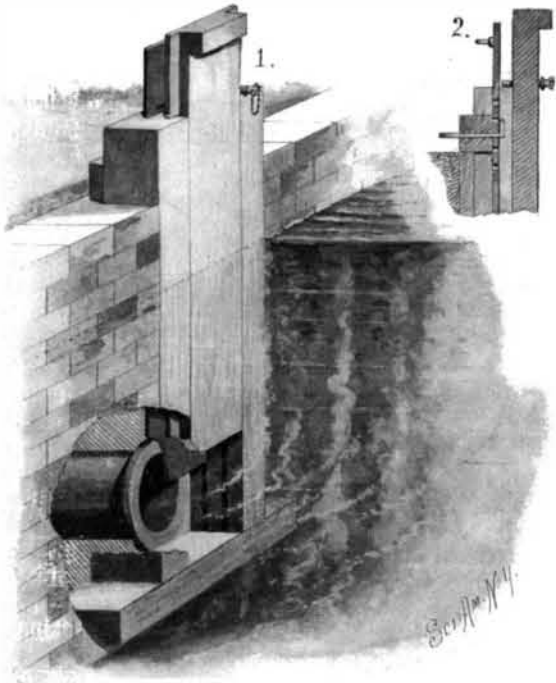


A HEAD GATE FOR IRRIGATING CANALS, ETC.

In sections of the country where the water from extensively constructed ditches or canals is sold for irrigating purposes, etc., it is of great importance that the seller shall be at all times able to limit the quantity supplied to each individual consumer, in order that all purchasers may receive their due supply; but as such supply is sometimes greater than is needed, it is also important to afford the purchaser means for cutting off the flow of water to his lands as desired. To attain these ends the head gate shown in the accompanying illustration has been invented and patented by Ignatius D. O'Donnell, of Billings, Montana. The back of the head gate is closed, as indicated by the broken away portion of the engraving, a pipe leading to it from the irrigating ditch, and in the sides of the gate frame are slideways in which the main gate, preferably of metal, moves vertically, resting upon the bottom sill to form a watertight closure, when the water

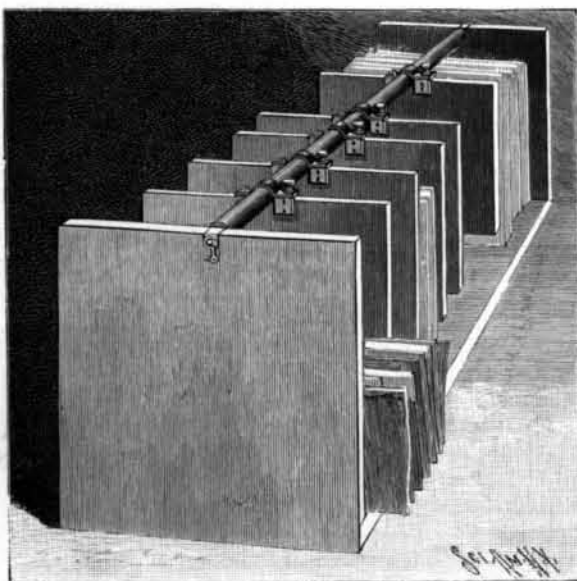


O'DONNELL'S HEAD GATE.

is to be cut off. In the upper portion of the gate are openings, by passing a latch through one of which the gate may be held at different distances from the bottom, to regulate the supply of water, the latch being adapted to be locked, and so arranged that it cannot be withdrawn from the outside or back portion of the frame, as indicated in the small sectional view. In addition to this gate an individual gate is provided, to be used only by the consumer, the latter gate sliding to closed position by its gravity, and being held at the desired elevation by passing a pin through one of a series of openings in the gate and into the frame. The arrangement is such that access cannot be gained to the locked latch bar of the main gate while the individual gate is in the frame, nor can the latch bar be removed, the main or company gate being set and locked after the amount of water to be sold and supplied has been measured and agreed upon, although the customer may at any time cut off as much of the flow as he may wish.

A CONVENIENT DOCUMENT FILE.

To facilitate holding in order, compactly placed and readily accessible, letters, bills, general office docu-



DERBY'S DOCUMENT FILE.

ments, etc., the simple and comparatively inexpensive device represented in the accompanying illustration has been patented by Richard C. Derby, 138 Bellevue Avenue, Newport, R. I. Supported on the end uprights is a removable rod, whose ends are angular to prevent its turning in the correspondingly shaped

notches of the supports, to which the rod is held by a hook at each end. Suspended from and slidable along the rod are a number of movable partition pieces, in the upper ends of each of which is a semicircular portion to engage the lower side of the rod, while a clamp plate pivotally connected to the partition piece has a semicircular portion to engage the upper side of the rod. One end of the clamp plate has an opening through which extends a lug from a plate secured to the partition piece at one side of the rod, a pin being passed through an opening in the lug, while the opposite end of the plate is secured in position by a thumb screw. The thumb screw engages a tapped hole in a plate secured to the partition piece at the other side of the rod, and on loosening the thumb nut the partition piece may be readily moved along the rod, to be tightened and held rigid, by means of the thumb nut, against letters and documents placed in the file, the partitions being moved closely against the documents, etc., to hold the latter in compact order.

Varieties of Cardamom.

At the annual session of German naturalists, which has just been held, Dr. Niederstadt, of Hamburg, spoke on this theme and stated that two varieties of cardamom are known to occur in commerce, namely, the small or Malabar cardamom and the long or Ceylon cardamom, both derived from *Elettaria cardamomum*. The wild cardamom which comes from Borneo is without importance. Besides, various other varieties are put on the market—the Siam cardamom, from *Amomum verum* and *rotundum*, and the wild or bastard cardamom, resembling the Malabar cardamom, which is said to be derived from *Amomum xanthioides*. This variety has met with a decided refusal in European markets, but is not without importance, as it is sometimes employed as a substitute for good varieties or for adulterating them. An admixture of such bastard cardamom is betrayed by the inferior odor and taste. It is, however, not without value to compare the following figures of analysis.

Genuine shelled cardamoms contained:

Water.....	15.25 per cent.
Extract soluble in ether.....	5.10 "
Ashes, including dirt.....	6.55 "
Starch and sugar.....	28.84 "
Wood fiber, nitrogenous matter, extractive matter.....	44.26 "

Distilled with water, the volatile oil passed over, which has to be agitated with ether. According to Koenig it amounts to about 3.8 per cent; but Niederstadt has come across crushed cardamoms in commerce which contained only 0.28 per cent of essential oil.

Bastard cardamoms contained:

Water.....	15.50 per cent.
Extract soluble in ether.....	4.04 "
Ashes, including dirt.....	7.50 "
Starch and sugar (sugar 0.42 per cent).....	24.00 "
Wood fiber, substances containing or free from nitrogen.....	48.96 "

Hence, outside of the smaller percentage of fat oil and essential oil, the two do not show any marked difference. The bastard cardamom, however, has a much more intense, camphorlike odor and taste, and leaves a sense of scratching and biting in the throat and on the tongue. Besides, the bastard cardamom is dirty gray, while genuine cardamom is yellowish-white. This lighter color, however, is not a natural one, but is produced by a bleaching process with sulphurous acid. This explains why sulphuric acid is frequently found present in the officinal cardamoms.

During the discussion Prof. Schaer also stated the great difficulty in examining cardamoms, as there exists no really reliable identity reagent, and called attention to the little value of microscopic investigation, when the seeds are in powder form. A useful estimation of genuine cardamoms may be founded, according to Schaer, on the fact that they always contain slight quantities of manganese. If manganese is easily detected in the ashes, the presence of genuine cardamom may be inferred.—*Drogen und Farb. Haendler* (Drug and Dyestuff Dealer).

A Paris Automobile Test.

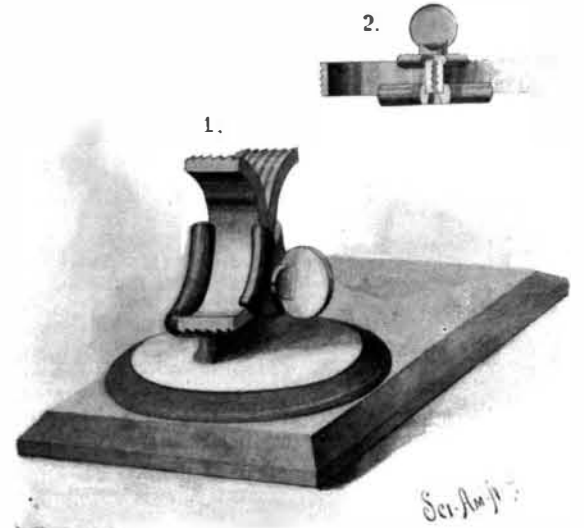
For some time there has been little or no news concerning automobile vehicles either in this country or abroad, but on February 14 there was a test between automobile vehicles which corresponds to the hill climbing contests of bicycles. This was the race up Suresnes Hill, at Paris, which corresponds very closely to the run from Fort Lee Ferry to the Hudson County Boulevard. The automobile vehicles were driven by M. René de Knyff and Baron de Zuylen, President of the Automobile Club de France. Though the recent rains played great havoc with the road, the contestants went up the long hill full tilt at the rate of fifteen miles an hour. Baron de Zuylen beat M. de Knyff by seventeen seconds.

A New Movement of the Heart.

A cablegram from Paris dated February 12 states M. Bouchard has discovered a new movement of the heart by means of the Roentgen rays. It is a rhythmic dilatation during respiration and is not connected with the ordinary movements of the heart. "It appears to arise," says The Sun, "from a diminution of pressure in the interior of the thoracic cage during inspiration."

AN IMPROVED KNIFE SHARPENER.

The illustration represents a simple and efficient device by means of which a knife may be quickly sharpened by simply drawing it between opposing sharpening jaws, the latter being so arranged that when one portion of the jaws becomes dull their position may be shifted to bring new sharpening faces in position to



NIELSEN AND THOMSEN'S KNIFE SHARPENER.

engage the knife. The invention has been patented by Michael Nielsen and Thomas S. Thomsen, of No. 133 North Main Street, Port Chester, N. Y. Fig. 1 shows the device in perspective, Fig. 2 representing a top plan view showing the cutting edges of the teeth. To a suitable base plate is secured a head whose upper face has oppositely curved track surfaces, there being grooved flanges at one side of the tracks and an adjustable flanged cap plate, the head and cap plate being provided with opposing recesses at their upper central portions, and segmental jaws are held to slide upon the curved tracks between the flanged surfaces of the cap plate and head. The inner opposing surfaces of the jaws are toothed, the teeth being transversely inclined, and having straight shoulders facing the direction from which the knife is to be drawn. The construction is such that the parts may be separated quickly and as readily assembled, the adjustment of the sharpening edges or jaws being accomplished by means of the set screw, without detaching any of the parts.

A RING SET HOLDING CLAMP.

To hold rings and other articles of jewelry set with precious stones, so that the setting will not be affected by the heat while the operator is working upon them,



THOMAS' JEWELER'S CLAMP.

the special form of clamp shown in the illustration has been invented and patented by Fred J. Thomas, of No. 225 Eighth Street, Cairo, Ill. Fig. 1 shows the device in position for work, Fig. 2 being a separate view of the clamp proper. On a suitable support, which also carries the charcoal pan, is a head and horizontally projecting stem, on which are pivoted two arms, adapted to swing to the open position shown in Fig. 2 or to the closed position to engage a ring or other article, as indicated in Fig. 1, the arms being held in closed position by a sliding collar, which is also adapted to slide over the head. On the free end of each arm is a quadrispherical bowl section, the sections registering where the arms are closed to form a hemispherical bowl, in the bottom of which are registering openings designed to receive the body of the article of jewelry as it is held by the clamp over the charcoal pan. These openings may be of any desired form to receive and hold different articles of jewelry in such manner that the bowl will protect the settings from the heat while the work is being carried on.