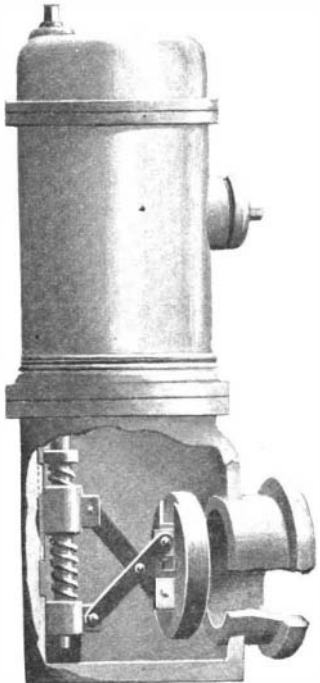


in shore, and the torpedo boats "Furor" and "Pluton" practically destroyed. The American fleet is shown in the foreground with the "Brooklyn" in the lead, followed by the "Oregon" and "Texas," while in the distance are seen the "Iowa," "Indiana" and the auxiliary yacht "Gloucester." The engagement at this time and in this position was probably the most exciting and picturesque of any during the battle, and its portrayal by the artist is very realistic and inspiring.

THREE RECENTLY PATENTED NOVELTIES.

In certain forms of fire-hydrants, the face of the valve is moved across the seat, whereby not only the valve, but also the seat, is injured. To overcome this objection Robert Hughes, of Waterford, N. Y., employs a novel arrangement of levers by means of which the valve is made to move parallel to a desired plane.

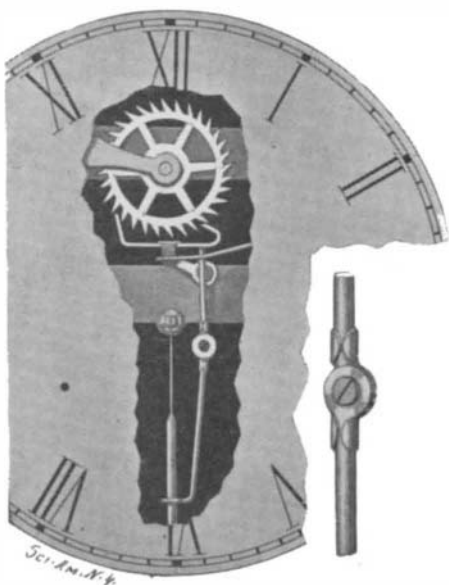


A SIMPLE VALVE MECHANISM FOR FIRE-HYDRANTS.

The valve is provided with two blocks, one fixed and the other capable of sliding in a slot. To each block one end of a lever is pivoted, the other end of one lever being pivoted to a support loosely receiving the end of a screw stem, and the other end of the second lever being pivoted to a nut threaded on the stem. The levers are pivoted together. When the screw-stem is turned in one direction the nut is carried up and the valve drawn from its seat. The sliding block as it works in its seat reduces the downward travel of the valve to a minimum. When the levers are pivoted together at their middle points there is no downward travel of the valve.

A self-marking try-square is an invention patented by Isaac W. Stephens, of Sardis, Tenn., which is distinctly novel in form and operation. The handle of the try-square is hollowed to receive a spring-actuated push-pin joined by a pin and slot connection with one end of a lever fulcrumed near its middle. The other end of the lever is loosely received by a recess in a scoring-plate having reciprocating movement in the channeled blade of the try-square. The edge of the scoring-plate is provided with elastic spring tongues formed with prongs bent in opposite directions. By pressing upon the push-pin the scoring-plate is moved in one direction. When the push-pin is released the spring moves the scoring-plate in the other direction.

A very simple and ingenious pendulum adjuster has



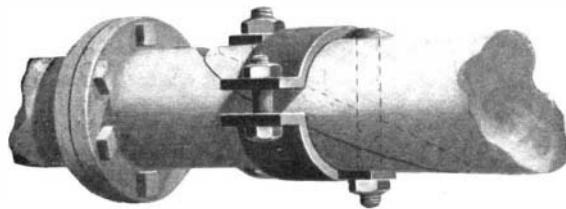
THE DIVIDED PALLET-ROD FOR ADJUSTING THE BEAT OF A PENDULUM.

been devised by Simon B. Parker, of Springfield, Mass. The novel feature of the invention consists in employing a divided pallet-rod, the two sections of which are connected by means of separable metal disks held together by a clamping-screw. Proper friction can be given to the disks by the adjustment of the clamping screw. By simply starting the pendulum to bank the pallet on the escape-wheel, the pendulum swings within its normal arc by reason of the adjustment of the disks. The arrangement can easily be applied to old clocks by cutting the pallet-rod in two and securing the disks in place.

REPAIRING A BROKEN SHAFT AT SEA.

On the 12th of December last, at three o'clock in the afternoon, the Danish steamer "Louisiana" was in the Gulf of Mexico, about sixty miles from the mouth of the Mississippi River, loaded with a full cargo for Aarhus, Denmark, when suddenly the first intermediate shaft broke completely through and the engines commenced to race violently. On stopping the engines it was found that the accident had happened within the shaft tunnel, a diagonal fracture 28 inches in length having occurred in the first intermediate shaft. The gland-bush in the watertight partition, and the foremost bearing, were found to have been demolished, as well as the head of the second bearing. On examining the shaft, which measured 11 1/4 inches in diameter, it was found that only one-quarter of its length was intact.

Repairs were started at four o'clock, one hour after the accident, the first work to be done consisting in boring two 1 1/2-inch holes through the fracture, one near each end, the engine-room force being also set to work at the same time forging the special tools required for the repairs. To hold the broken ends together two band-rings were taken from the hoisting gear and clamped around the shaft, and in order to get rid of the vibration from the propeller the tail-end shaft was disconnected. It took 39 hours altogether to complete the boring of the two 1 1/2-inch holes. During the boring a band was taken from the foremast of the steamer and forged into a collar 1 1/2 inches thick by 6 inches in width, and of the diameter of the shaft. As soon as the holes had been bored to 1 1/2 inches, work was started on enlarging them to a diameter of 2 1/4 inches, and two bolts were taken from the main bearing, cut down to length and bolted through the shafts, as shown in the drawing. The forged collar was then fitted on and Babbitt-metal was poured into the joint. The first bearing box was replaced by a wooden one, and the tail-end shaft and the repaired intermediate shaft were then connected up. The repairs were completed at one P. M. on the 17th, the chief engineer and his assistants having worked continuously day and night for nearly five days. At three



THE SHAFT REPAIRED.

P. M. the vessel started at slow speed and reached the lightship at the South Pass of the Mississippi six hours later, where she anchored until she was picked up by a tug and taken into the river. The greatest credit is due to Capt. Jensen and the engineer staff for the pluck and resourcefulness shown in the carrying out of such a repair job at sea.

The Charleston Exposition.

The new Exposition at Charleston will open December, 1901, and will remain open until June, 1902. It is intended to advertise to the world the progress of South Carolina and the neighboring Southern cities, and the advantage Charleston enjoys as a natural seaport for the trade between the West Indies and the United States. There will be a large number of exhibits from the West Indies, and from Florida, and the whole exposition will be characteristic of the tropics. The grounds cover about 250 acres of land, and are situated on the Ashley River, 4 1/2 miles above Charleston. As the river is navigable for large ships up to that point two or more naval vessels will be stationed there. An artificial lake will be constructed near the middle of the grounds extending over an area of 30 acres. In the middle of the lake will be an electrical island. Two old colonial houses situated on the exposition grounds will be retained. The plaza will be 1,200 by 900, and there will be an auditorium capable of holding 6,000 persons. On it will also be situated the Cotton Palace and the buildings of Commerce and Agriculture. The style of architecture will be Spanish-Renaissance. The materials used will be pine and staff.

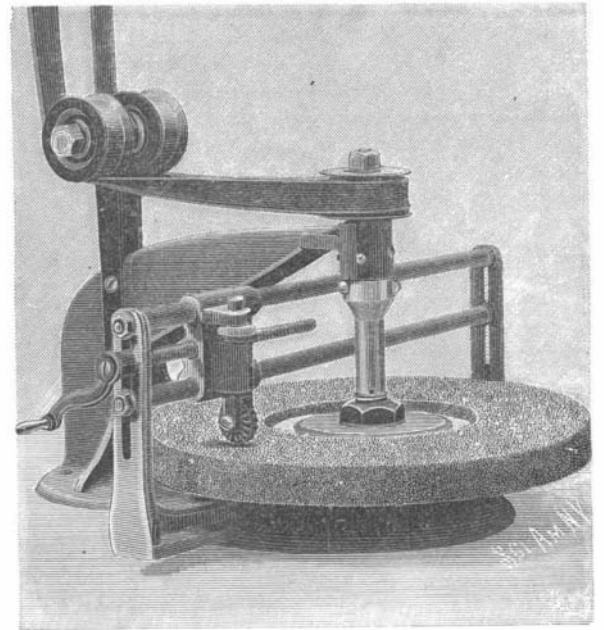
Harvesting Extraordinary.

The bulk of the flax grown in Kittson County, Minn., was harvested under very remarkable conditions. The fall was unusually wet, and it was found impossible to get on the fields. Freezing weather came almost immediately thereafter, and an extremely heavy fall of snow. The old methods had to be abandoned, and mowers brought into use. The sickle bar was entirely under the snow, and after the flax was cut it still stood as erect as ever, but the hay-rake following had no trouble in gathering it, as it was so thick and so entwined that the rake caught it all.

A SIMPLE AND EFFICIENT CLIPPER GRINDER AND SURFACE GRINDER.

The subject of the accompanying illustration is a novel grinding device for sharpening the blades of clippers. The inventor of the machine is William Taber, and its manufacturer J. Van Benschoten, 14 to 20 Catherine Street, Poughkeepsie, N. Y.

As our illustration shows, the machine comprises essentially a frame having a horizontal arm and a base. Between the horizontal arm and the base a vertical shaft, carrying a 14-inch emery wheel, turns on a cone bearing. Power is transmitted by belt and pulley. In its upper face the stone is provided with a circular depression four inches in diameter.



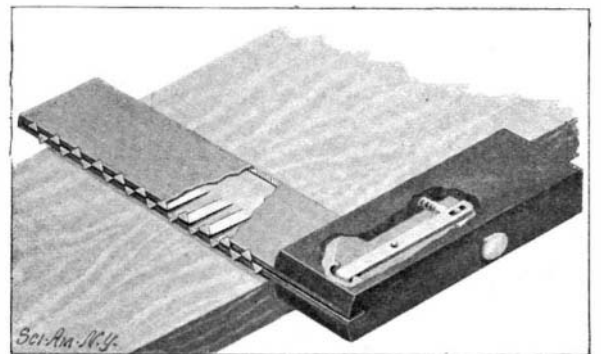
THE VAN BENSCHOTEN CLIPPER GRINDER.

On the five inches of flat grinding surface thus furnished clippers are held parallel and moved laterally over the two edges, whereby the surface of the stone is maintained both flat and true. In order that the stone can be trued without removing the vertical shaft from its bearing, a special truing attachment has been devised consisting of two half-inch rods, fitted in proper supports on which a star-wheel emery-dresser is moved gradually across the surface by means of a small crank and a screw. The dresser is also adjustable, so that any cut desired can be made. Thus not only can the stone be trued absolutely, but all glaze is removed as well.

Owing to the accuracy with which the surface of the stone can be ground, this device can be used on any light surface, such as the blades of sausage cutters, meat choppers, dies, cutter knives, and the like.

The Current Supplement.

The current SUPPLEMENT, No. 1312, has many interesting articles. "The Ancient History of Water Engineering" is by James Mansergh. "Observations on Crookes Tubes" is by H. Westbury. "The Optics of Tri-Chromatic Photography" is by F. E. Ives. "Mammals and Reptiles; or, What Was the Ice Age?" by



TRY-SQUARE WITH SELF-ADJUSTING SCORING DEVICE.

Joshua Rutland, is a most interesting paper. "The Mosquito as Transmitter of Micro Organisms" is by Dr. R. Menger. "The Galileo Museum at Florence" is the subject of an interesting engraving. The usual Consular matter and Trade Notes and Receipts are given.

Contents.

(Illustrated articles are marked with an asterisk.)

Automobile, De Dietrich*.....	120	Planets, communication with.....	118
Books, new.....	123	Rhone, hydraulic power of.....	118
Build, are you about to?.....	115	Science notes.....	115
Buoys, petroleum illuminated*.....	117	Shaft, repairing broken*.....	122
Dredge dipper*.....	116	Silk manufacture*.....	113, 118
Exposition, Charleston.....	122	Smokeless powder and gun erosion.....	114
Gramme, Z. T.....	115	Steamers, high-speed.....	114
Grinder*.....	122	Sugar manufacture, Russian.....	116
Harvesting, extraordinary.....	122	Telegraphy, wireless, Tesla's.....	114
Inventions, prizes for.....	114	Trolley car, funeral.....	118
Light, therapeutic action of.....	117	Try-square.....	122
Naval battle, Santiago*.....	121	Tunnel, Rapid Transit.....	114
Novelties recently patented*.....	122	Whales, running down*.....	121
Orchestra-man*.....	117	Yacht, royal.....	114
Our business and personal want column.....	115	Zodiacal light.....	115