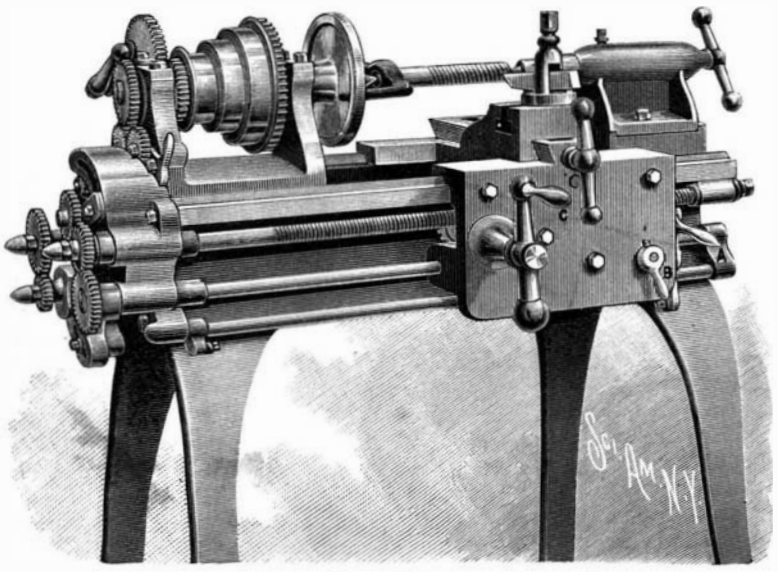
AN IMPROVED SCREW-CUTTING LATHE.

This lathe permits the operator to easily and quickly bring the cutting tool back to the exact position on the beginning of the cut, so that a perfect and uniform thread is quickly made and no time is lost in finding the beginning of the cut, as is the case with screw-cutting lathes of the ordinary construction. The improvement has been patented by Mr. James H. Paterson, Box 436, Ingersoll, Ontario, Canada. The lathe has the usual bed supporting on one end the head stock with spindle engaging the work, held



PATERSON'S SCREW-CUTTING LATHE.

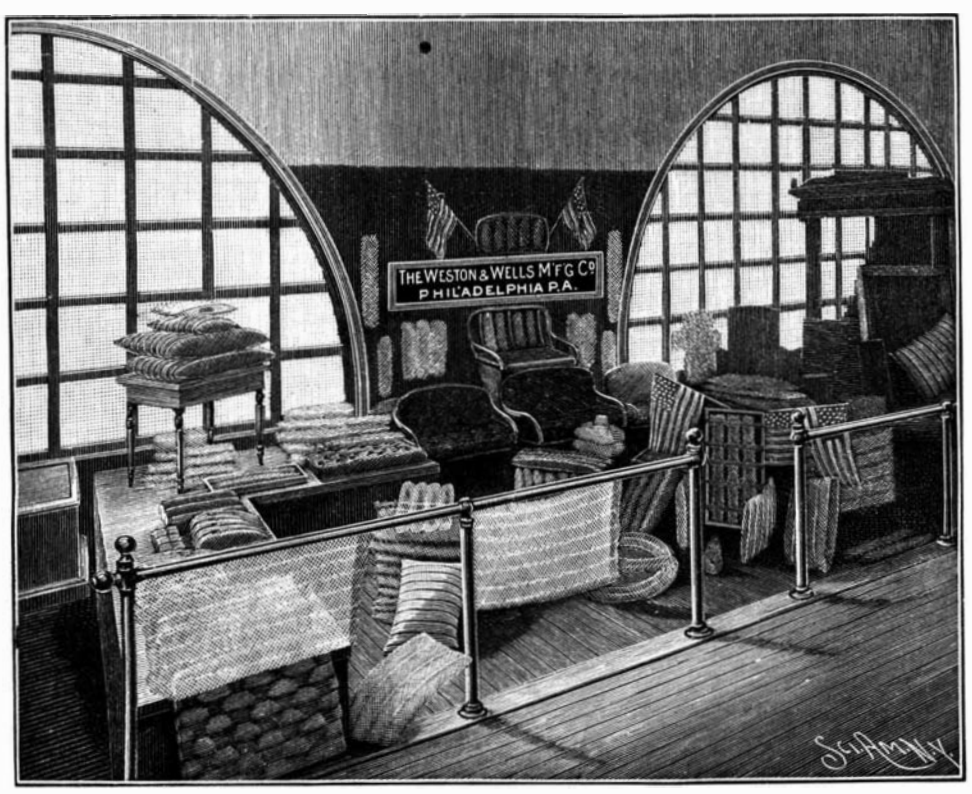
at its other end in the mandrel of the tail stock, the cutting tool being mounted in the usual tool holder, transversely adjustable on the carriage sliding in bearings on the bed. Through the front of the carriage passes the feed shaft, journaled in bearings at the ends of the bed, and this shaft is engaged by a half nut sliding in bearings on the inside of the carriage by moving the handle, A, to a vertical position, the carriage being disengaged from the feed shaft when this handle is in a horizontal position. When the half nut is out of engagement with the feed shaft the carriage may be moved backward or forward by turning the handle, C, on a transverse shaft carrying a pinion meshing with a gear wheel on a short shaft turning in bearings in the carriage. The latter shaft has a gear wheel meshing with a rack on the bed, and is also adapted to be connected with a longitudinal auxiliary shaft journaled below the feed shaft. and forming the principal part of an intermediate mechanism for controlling the speed of the feed shaft, to permit of cutting any desired number of threads to the inch on the work, the number not necessarily being a multiple of the number of threads per inch of the feed shaft. This auxiliary shaft is thrown into and out of connection with the carriage by means of a bevel gear and pinion connection actuated by the handle, B. Connecting the auxiliary shaft with the feed shaft is an adjustable gear and clutch mechanism, and the arrangement is such that no backing belt or other means are necessary to catch the thread on the work, whether the thread to be cut is or is not a multiple of the number of threads per inch on the feed shaft.

Vanillin from Cloves.

Professor Jorissen and E. Hairs, noting the similarity in composition between vanillin and eugenol, have examined cloves and the essential oil obtained from them to ascertain whether vanillin was one of their constituents. An ethereal tincture of cloves was prepared and treated with solution of sodium acid sulphite. This solution, being separated, was then treated with a mineral acid and the sulphurous acid thus liberated removed, after which the mixture was agitated with ether. This, on being separated and evaporated, left a residue which gave off a strong odor of vanilla. A similar, crystalline residue was obtained on subjecting oil of cloves to the same treatment. The crystals were soluble in water, especially when warm, also in alcohol and ether. They were colored by ferric chloride, began to melt at 79°, and sublimed readily. The yield was very small, so that an extended examination was not possible, but the investigators consider that the physical and chemical characters of the product, so far as they have been ascertained, indicate its identity with vanillin.—*Bull. de Pharm.*

TORSION BRAIDED WIRE MATTRESSES, PILLOWS, CUSHIONS, ETC., SHOWN AT THE EXPOSITION.

The articles shown in this exhibit presented a degree of novelty and utility that caused them to attract much attention, and to receive the highest award. They are the product of a comparatively new manufacture, originating in the invention, in 1882, by Dr. Henry Weston, of Philadelphia, of the cylindrical braided wire pillow. The successful application of the principle was not attained without further costly experiment, and the invention, by Mr. Joseph L. Wells, of the braided wire torsion spring, by which perfect resiliency is obtained, and whereby pressure on any part and to any degree causes the wire to twist instead of bending or breaking. Mattresses, pillows, cushions, etc., made according to this improvement, afford a gentle, softly yielding support, but they do not become heated, as is the case when they are filled with feathers, hair, moss, or other material, for each slight movement changes the air beneath, and they do not absorb odors, become musty, or retain perspiration or disease germs. The mattresses and pillows are covered with a light covering of fine curled hair or other material, which may be removed for cleaning when necessary; but there is little to attract bugs, moths, or other insects. The wire is heavily tinned to resist rust, and the articles are all well made of so excellent a quality of steel wire as to be practically indestructible. The best known doctors and surgeons in the country have written very strong testimonials as to the superiority of these goods for hospital service, and for general use their adaptation is equally obvious. In warm weather, especially, they constitute a positive luxury. These goods are made only by the Weston & Wells Manufacturing Company, 1110-1116 Noble Street, Philadelphia, Pa.

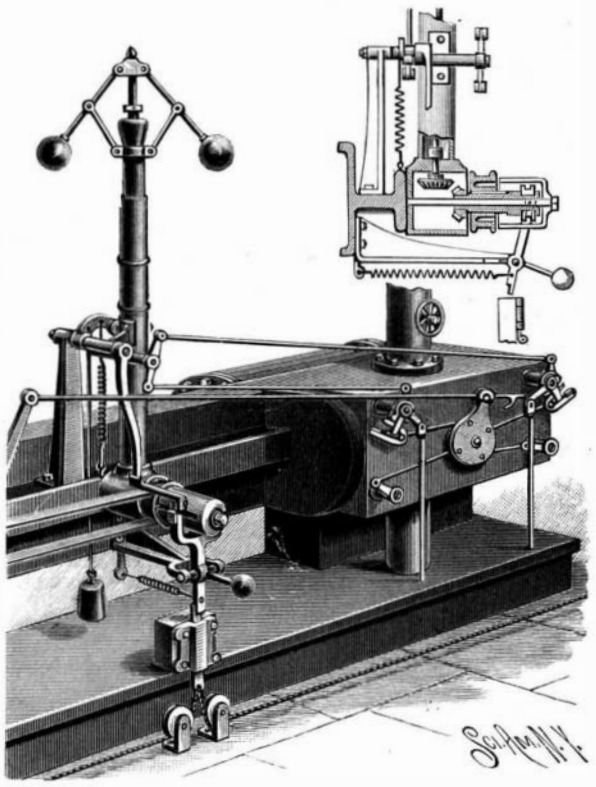


THE WORLD'S COLUMBIAN EXPOSITION—EXHIBIT OF THE WESTON & WELLS MANUFACTURING COMPANY, OF PHILADELPHIA PA.

ASPHALT pavements were first laid in Paris in 1854.

AN AUXILIARY CUT-OFF FOR ENGINES.

This is an improvement capable of attachment to any engine, whereby the engine may be stopped in a moment from any point in the building. It has been patented by Mr. John H. Tennyson, of No. 54 Charlton Street, New York City. The small figure represents a longitudinal section through the governor driving gear, illustrating a shifting form of gear, and the gear, practically in two sections, in its shifted position. A beveled gear at the lower end of the governor stem constitutes one section, and another beveled gear on a hub sliding on a guide rod in a casing forms the other section, there being on the hub a clutch sleeve with trunnions passing through blocks sliding in the arms of a fork, whose shank, at its lower end, is adapted to engage with a bolt. When the stem of the fork is in engagement with the bolt the governor gears will be in mesh, which is their normal position. A spiral spring tends to draw the shank of the fork out of engagement with the bolt, and, to accelerate the movement of the fork when released from the bolt, a weight is also attached to the front portion of the shank near its lower end. At the rear of the governor casing is a standard in which is journaled a rock shaft with a rigidly attached curved trip arm, from which are suspended weights capable of drawing the arm downward and rocking the shaft. The arm has at one side a friction roller adapted to contact with the governor crank, carrying the shifting rod connected with the governor sleeve to draw downward the governor pawls. The governor crank also carries the usual rocking bar, to the opposite ends of which the ordinary cut-off rods are pivotally connected. The cut-off valve has stops, and when



TENNYSON'S AUXILIARY CUT-OFF.

the cut-off rods are shifted by the trip mechanism one of the stops will engage with a crab to prevent the pick from touching the valve fingers, insuring a positive and permanent cut-off. To make the forward movement of the trip arm as rapid as possible, such movement is aided by one or more springs. A lock arm extending downward from the rock shaft has at its lower end a friction roller resting on a lock bar secured to the upper end of one member of the fork connected with the shifting governor gear, normally holding the rock shaft in such position as to prevent the trip arm from engaging with the governor crank. The bolt which engages the shank of the fork is connected by chains or cables with any desired part of the building, and by withdrawing the bolt the two sections of the driving governor gear are separated, thus silencing the governor. At the same instant the lock bar is withdrawn from under the lock arm and the weights and springs draw downward the trip arm, engaging the governor crank and causing the governor balls to be closed, the crank also shifting the rocking bar of the cut-off rods to cause the valves to cut off. The device may be applied to any cut-off engine or any ball governor.

Curious Origin of a Fire.

The other day a heavy delivery wagon backed up in front of an Eighth Avenue furniture store. The smoothness and slant of the asphalt gave greater momentum than was expected, and the hind wheels struck the curb with a crash. The contact of stone and iron drew out sparks. Some of these flew into a wisp of packing hay that soon gave forth smoke and flame. A bucket of water subdued the blaze, but, as a fireman remarked, it was an interesting object lesson on one of the mysterious ways in which serious fires sometimes start.