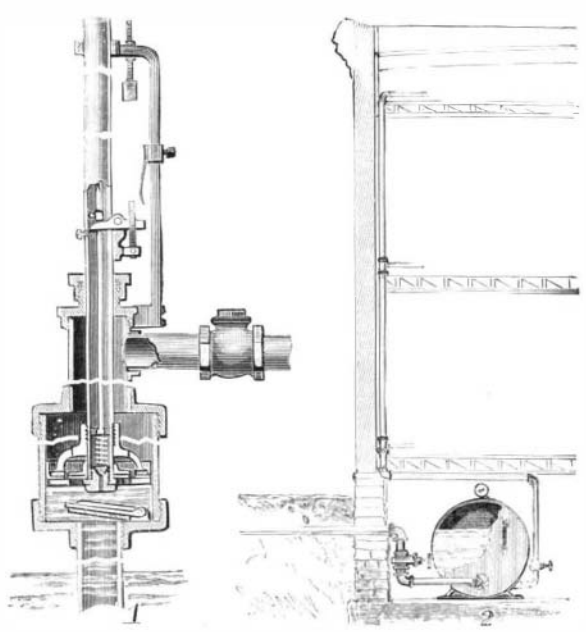
A PNEUMATIC WATER SUPPLY SYSTEM.

The problem of water supply is often very serious in buildings which are isolated and have not the facilities for connecting with a general water-distributing system such as is provided for a town or city. Those who are thus situated will be interested to examine the recent invention of Mr. Edward D. Deeter, of Milford, Ind. As shown in our illustration, the invention provides a peculiarly constructed pump, adapted for elevating water from a well, and forcing it into a sealed tank against the air confined therein, so that the pressure of the air will force the water from the tank into a system of water pipes for the supply of one or more buildings. The construction of the pump is such that it will pump air with the water into the receiving tank, thus maintaining a suitable pressure for the service pipes. The construction further permits adjustment of the mechanism for the exact graduation of the amount of air pumped, or an arrest of the air-pumping operation, as may be found necessary. Fig. 1 shows the pumping section, while Fig. 2 shows the relative position of the tank in the building to be supplied. The pump is situated at the top of the lift pipe, from which water is forced through a pipe at right angles thereto, and is conducted into the tank. A clack-valve covers the top of the lift pipe and prevents regurgitation of the water lifted into the cylinder. A hollow plunger-rod extends into the cylinder and is provided at its lower end with a cup-shaped packing-ring, which engages the inner side-wall of the cylinder, and a disk valve which, on upward motion of the plunger, is adapted to close the openings in the base-plate of the plunger-head. The lower end of the hollow plunger-rod is closed by a plug which serves to hold the base-plate in position. The central passage extending through this block is closed by a valve under spring tension. The stem of this valve extends upward and is engaged near the top by a tappet-lever hinged to and passing through the wall of the hollow plunger-rod. An upright post secured to the upper end of the cylinder is provided with an opening at its upper end which affords a bearing for the plunger-rod.

The operation of the main plunger is similar to that of the ordinary pump. On the upward stroke water is drawn past the clack-valve into the main cylinder, and on the downward stroke it is forced past the disk-valve into that portion of the cylinder above the plunger head. On the next succeeding stroke the water is forced into the receiving tank. An ordinary check-valve prevents a return flow of the water. As previously stated the pump is designed to supply air pressure to the tank so that the water may be forced to the upper story of a high building. The air is fed into the pump in the following manner: When the plunger-rod is traveling upward, at a predetermined point the outer end of the tappet-lever mentioned above encounters a spring-limb secured to the guide-post, and is thereby thrown down, its inner end lifting the valve from its seat in the plunger-rod plug. The lever is secured in this position by a pair of spring clamping-arms situated directly below, and is thus held until released by a V-shaped pressure-block at the top of the guide-post, which spreads the spring-arms apart. Air is thus admitted to the cylinder at each stroke, in quantities which can be regulated by the position of the spring-limb on the guide-rod, and from the cylinder the air is pumped with the water into the receiving tank. To stop the pumping of air it is necessary merely to raise the spring-limb to its highest position, where it cannot engage the tappet-lever.

Though the pump, as stated above, is designed for use in furnishing a water supply for buildings not connected with the general water-supply system, it will readily be seen that the invention would be useful in connection with a general water supply for the elevation of the water to a greater height than could be otherwise reached. The pump will also be found useful for the transmission of power, for pneumatically-operated guns, pneumatic or hydraulic drills, and, in fact, for almost any operations which employ pneumatic or hydraulic pressure.



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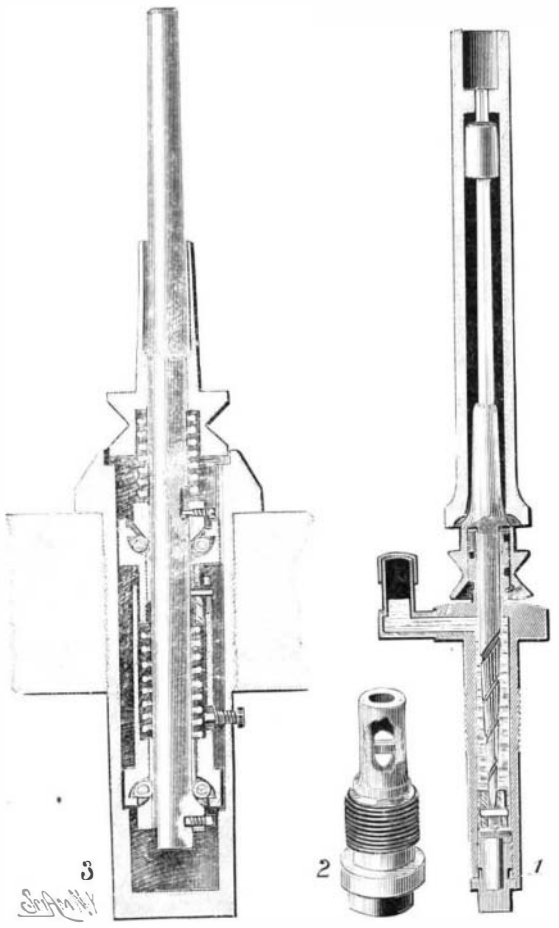
IMPROVEMENTS IN SPINNING SPINDLES.

Some recent improvements in spinning spindles have been made by Mr. William Gihon, of Chicopee, Mass. One improved construction is such that the spindle carrying the bobbin or spool is free to turn upon a support and is held from slipping from its proper position while in action, and yet is capable of being quickly and conveniently disengaged from its support when desired, without the manipulation or removal of fastening devices. The bearings and lower portion of



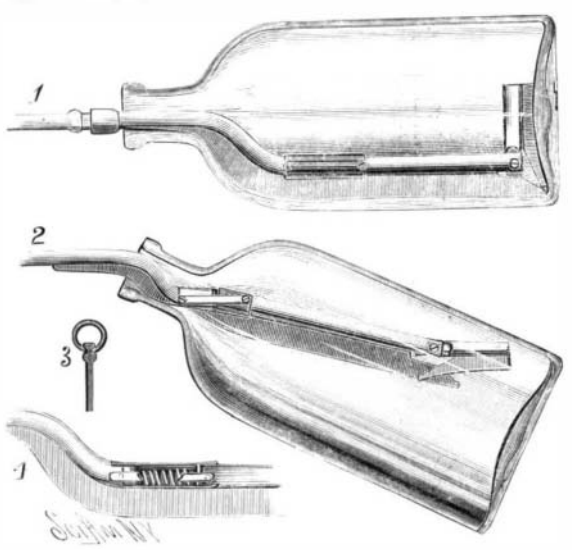
IMPROVEMENTS IN SPINNING SPINDLES.

the spindle are designed to turn in a lubricating bath, and a special form of support forms the lower bearing, which support may be quickly shifted to present a fresh surface to the spindle point in case of wear. These improvements are all embodied in the construction illustrated in Fig. 1. The main support of the spindle is a hollow tube provided near its upper end with an angular feed pipe through which oil is poured into the interior chamber. The lower end of the main support is closed by a plug screwed therein, the flanged portion of the plug being provided with a washer to prevent leakage of the oil. The shank of a tubular bearing-section fits into the bore of the plug. This tubular bearing-section is provided with openings in oppposite sides through which a pin of semi-circular or polygonal cross-section is loosely passed. The plug and bearing-section are shown assembled in Fig. 2, the bearing-section being broken away to show the pin. The pin forms a support for the end of the spindle and is capable of sidewise adjustment, so that when worn it may be shifted sidewise to present a fresh bearing surface. The upper end of the spindle is provided with an exterior spiral thread, and in the interior is a bushing which fits the spindle loosely and is set in such manner as to prevent turning in the bore of the base. This gives what is termed a "ring-bearing" for the spindle. The spindle is provided at its central portion with an exterior conical enlargement. Immediately below this enlargement is a whirl attached to the spindle. This whirl fits loosely over the top of the main support or base and is held in position by a lug which fits into a groove on the base immediately below the spiral thread. Whenever it is desired to remove the spindle, it needs simply to be drawn upward and turned, whereupon the lug will travel up the spiral thread. In order to prevent the oil from feeding upward, a spiral groove is formed on the lower end of the spindle, which leads the oil down to the lower bearing. At the upper end of the spindle is a sleeve loosely mounted which prevents the spool or bobbin from wobbling. In order to further assure a smooth traveling, the upper end of the spindle is passed through an opening made in the inner partition at the upper end of the spool.

Another construction is shown in Fig. 3. Here it will be seen that the spindle is provided with self-adjusting ball-bearings. The body of the spindle consists of a casing closed at the bottom and open at the top. An exterior collar at the top of the casing forms a bearing adapted to rest upon the support to which the casing is threaded. An annular depression is found in this collar to give vertical and guided movement to the whirl on the spindle. A sleeve portion extends upward from this whirl and is provided with longitudinal slots, so as to securely hold any spool carried on the spring portion thus formed. The spindle passes through the whirl and extends in the casing to a point near the bottom. A spiral spring encircles the spindle, pressing between the whirl and the upper cone-bearing, which latter is adjustably secured to the spindle by a set screw. The spring serves as a cushion for the cone. In connection with the cone a ball-race is provided, having suitable pockets for the balls, which are held in place by an inner sleeve. A second cone is fastened face upward to the lower end of the spindle. This also has longitudinal adjustment, but less movement than the upper cone. The ball-race for this bearing is provided with an upwardly extending sleeve which telescopes with a sleeve on the upper ball-race. The sleeves are permitted longitudinal motion, which is limited by a slot in the lower sleeve through which a pin on the upper sleeve passes. A coil-spring between these ball-races serves as a cushion for both bearings. A set screw passes through the main casing and fits into a slot of the lower ball-race sleeve to hold the parts in position. The object of providing the spring cushions is to permit raising of the spindle and whirl a required distance, should the bobbin or spool cling to the whirl, without detriment to the various parts of the device, and without permitting the parts to leave the casing. The casing, it will be observed, forms a well in which oil may be placed; thus the spindle is made self-lubricating. It is clearly evident that this construction will permit easy running and prevent breaking of the yarn. Further, the spool may be removed without disconnecting any parts of the device or interfering with any of its mechanism.

BOTTLE-WASHING BRUSH.

A frequent objection to the bottle-washing brushes of the class having a curved, tubular body is that it is impossible to insert the brush into a bottle having a small opening. The inventor of the brush here illustrated has so constructed the device that it may be easily inserted into the bottle, no matter how narrow the mouth may be. The body portion of the brush consists of two tubular sections, one being curved so that the rubber brush secured thereto will engage and conform to the shape of the inner surface of the bottle. The tubes are split along their under surfaces to receive the edge of the brush material between the two ribs formed thereon, as shown in cross section in Fig. 3. A ferrule is fastened to each end of the tube sections by screws passing thereto, and these screws form supports to which the ends of a helical spring are secured, whereby the two sections are flexibly connected with each other. To hold the sections in alignment two straps are employed, which are mounted at one end to swing on the screws which hold one of the ferrules to its respective tube section, and have slots at the opposite ends through which the screws of the other ferrule pass. To prevent a lateral movement of one of the sections relative to the other, one of the ferrules is provided with a projection designed to engage a notch in the other ferrule. The back portion of the brush is provided with perforations through which water may pass to the interior of the bottle, and at the extreme end of the brush is a swinging section which is adapted for washing the bottom of the bottle. In inserting the brush into the bottle, the two sections will assume substantially the positions indicated in Fig. 2, and when fully inserted, the spring will cause the sections to assume their normal position, as indicated in Fig. 1. The outer end of the tube is designed to be connected with a water-supply in a bottle-washing machine, and the bottle is to be rotated relatively to the brush in the usual manner. A patent for this invention has recently been granted to Mr. Robert Hoerning, Brooklyn, N. Y.



BOTTLE-WASHING DEVICE