

out in a small stream from it. It was near the bottom of the pipe and was 3 feet long and 12 or 13 inches wide. It was considered by the experts that the break was due to structural weakness in the casting and it was impossible to detect it when the pipe was laid. There was great damage done to the sewer on Central Avenue, which was caved in and which will require several days to rebuild. It is estimated that 4,000,000 gallons of water were wasted before the gates could be closed and the water diverted to other mains.

Canvassing a Ceiling.

The canvassing of a ceiling is a job full of trouble for the inexperienced hand, and not altogether a matter of pleasure, says The Master Painter, for anyone else. Different workmen have different ways of doing it. We think, adds the editor, our way as good as any, and better than some. It is not easy to describe the way, however. Then, the character of the job—cheap or otherwise, paint or paper, and so on—must be considered. To begin with, cheap canvas for a cheap job, and good material for a better job. That's the rule; but we would advise a good muslin for even a cheap job, unless you are going to leave the country for good.

One way to canvas is to sew together enough strips to cover the entire ceiling. Then attach one corner of it to one corner of the ceiling, adding a few more tacks along the side selvage, but not driving in the tacks all the way. Now, go to the opposite corner and tack there as you did the first. Then tack all the edge between the two corners. Now you have fastened one end of your canvas. Don't forget to pull as you tack. Beginning again at the first corner, tack along the side, stretching as you go. Then go to the second corner, and tack along that side. Lastly, tack the remaining end.

As to stretching, note that it is not well to get the canvas drum-tight. If overtight, the canvas is liable to wrinkle in time, and nothing should be more dreaded. Should the canvas bag a little, no matter, as it will not be noticed by the casual visitor. In fact, it is impossible to prevent some degree of bagging, no matter how one may try.

For this reason we prefer a one-piece canvas, hanging loose, as it will show but one bag, and that a rather inconspicuous and not ungraceful bag either.

Shower-tack it, and you produce the effect of a carriage seat cushion. With blind-seams the same objection obtains. You get not one but several bags, and these by no means slightly ones.

Be sure to secure your edges well with tacks. Use six-ounce tacks. Put in a double row for making it sure. Blind-tacking is done when the canvas has been sewed in one piece, an inch seam being left on each joining, and this strip is "blind-tacked" to the ceiling.

To use single width strips, as in cheaper jobs, using a good strong muslin, take one corner of the strip and tack it in the angle of the wall and ceiling, making thus a little lap over. Drive the tack only enough to hold the material in place. Now go to the other end corner and repeat the same thing there. Next tack the other selvage edge of the strip, taking up the slack, and putting in a few tacks merely to hold in place. Then the strip is in position for the final stretching and tacking. Begin by tacking at the center of the side wall, tacking thence both ways, taking out the first tacks as you go. Pull the muslin as you proceed with the tacking. Tack the other selvage edge as you did the first, only that fewer tacks are needed here, as the next strip comes on top of it, to help secure it. But be sure to draw the material tight. Then tack both ends of the strip, drawing tight and tacking close to the wall.

We now take up the next strip and tack its corner over the first strip, opposite our starting point with the first strip. Then go to the other end and make that fast, temporarily, returning to the first point and tacking all along the edge over edge of the first strip. Don't pull the material too much, but just enough to make it smooth and straight. Temporary tacks will hold it out of your way. Finish as with the first strip, and proceed with the remaining strips until the other side of the room is reached, when you finish up as you began.

Just here remember that you will need a selvage to tack on against the wall, and hence, if your last strip proves to be too wide, split it, and put the cut side on the selvage of the preceding strip, so that you will still have a selvage for the last tacking. Use as strong a muslin as you can afford for a ceiling. Lighter material answers very well for side walls.

In tacking the selvage edge, see that the head of the tack holds down the edge, so that it won't turn up under the paper and cause trouble. Drive in all tacks

as far as possible, so that they will be lower, if anything, than the material.

Where the canvas is in one sheet, it may be rolled on a pole, and an assistant can hold it while you tack. The double seam being next to the ceiling, you can tack it to the latter, and no tacks will show on the surface. This is "blind-tacking." The tack is driven in about a quarter inch from the line of sewing. Unroll about a foot more than the single width of strip at a time. Draw your edge taut as you tack.

The muslin or canvas may be sized with glutol paste, over which paper, water, paint, and oil paint will adhere perfectly.

Death of Sir William Jenner.

Sir William Jenner, Physician in Ordinary to the Queen and the Prince of Wales, died December 11, at the age of eighty-three. He is principally noted for distinguished services in the field of clinical medicine. He was the first to establish, beyond dispute, the difference between typhus and typhoid fevers.

The Current Supplement.

The current SUPPLEMENT, No. 1199, contains a number of articles of great interest. "The Gular Pouch of the Great Bustard" is a most curious and interesting ornithological article. "Roman Construction," by G. W. Percy, is continued and is a valuable study. "Dr. William R. Brooks" is a biography of a noted astronomer. As director of the Smith Observatory he has been very successful in comet discovery, having just added the twenty-first to his list. "Calcium" is a paper by Sir Robert Ball, and the number is concluded by a large number of formulas for test papers.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

HARROW—PETER J. HELLER, Montclair, N. J. The harrow of this inventor comprises a toothed frame mounted upon a pair of wheels. An axle connects the wheels and has vertical members formed as tubes open at the top and bottom. Rods slide in the tubes and are attached to the harrow-frame. Springs surrounding the rods between the lower ends of the tubes and the frame, are adapted to hold the frame down. Brace-rods attached to the harrow-frame embrace at their upper ends the vertical rods above the tubes. Lifting-levers mounted upon the axle are attached to the harrow-frame. A depressing-lever having its pivots supported from the harrow-frame, engages the axle, whereby the load upon the axle may be transferred to the harrow-frame when desired.

SCYTHE—SANFORD J. BAKER and JOHN KING, Oakland, Me. The blade of this scythe is formed with ribs extending over the rear portion of the blade. The ribs diminish in size from the rear to terminate in points. Considerable strength is thus given to the blade, and the danger of the metal's breaking when striking against hard substances is lessened.

PLOW-FENDER—JOSEPH H. TAYLOR, Lewisport, Ky. This fender comprises a plate provided with an orifice and with a curved slot concentric therewith. Pins held by an arm fastened rigidly to a clamp adapted to be attached to the plow-beam, are passed respectively through the orifice and through the slot. By this means the fender is adjustably held on the arm. A series of slots in the plate permit fine earth to pass through the fender. The fender may be used on any plow and is designed to protect young plants during the tilling of the soil.

Bicycle Appliances.

BRAKE—LOREN E. CLARK, Shenandoah, Pa. The purpose of this invention is to provide a powerful bicycle-brake which shall have a large effective surface within a comparatively small space. To this end an auxiliary brake-wheel is used, provided with an exterior and interior band-brake. By pressing upon a lever, the exterior band is brought into frictional engagement with the brake-wheel, and the interior band by means of toggle-links is spread into engagement with the inner surface of the wheel.

Engineering Improvements.

ROTARY ENGINE—JAMES C. WALKER, Waco, Tex. This rotary engine is an improvement upon the mechanism of an engine for which patents were granted to the same inventor. In the present engine, the inlet-port and its cut-off valves are connected with mechanism for operating these valves. The mechanism in question comprises a drive-shaft geared with the engine-shaft; a disk mounted on the drive-shaft to rotate therewith, having a fixed cam to move the inlet-valves in one direction; a ball-governor mounted on the drive-shaft, and a cut-off member mounted on the disk to rotate therewith, but having movement independent thereof. The cut-off member operates to move the valve in a direction reverse to that of a fixed cam on the disk. A rack and pinion mechanism is operated by the shifting

of the ball-governor held to engage with and shift the cut-off member.

Mechanical Devices.

COLOR PRINTING-MACHINE—WILLIAM H. WALDRON, New Brunswick, N. J. In cylinder color printing-machines considerable difficulty has been experienced in changing the machine for differently-sized printing-rollers, as it is evident that in doing so, the bearings for the printing-rollers must be adjusted to bring the roller into contact with the periphery of the impression-cylinder. Heretofore the various adjustments were made separately and required considerable time and skill. The present machine is provided with a bracket fitted to slide in fixed bearings and carrying a printing-roller. A frame sliding on the bracket carries an apron. By means of a screw-rod an adjustment of the bracket in its bearings and of the frame on the bracket may be simultaneously effected.

FISHING REEL—GEORGE O. BROSNAM, Jr., Pensacola, Fla. To permit a fisherman to wind up a line evenly on the spool and to enable him to stop the line at will when casting, this inventor employs a gear-wheel connected to revolve with his reel and adapted to be engaged by a swinging locking member in order to prevent the spool from turning in one direction. A spring acts on the swinging member to hold it in adjusted position. A crank-handle on the swinging-member enables the line to be readily wound up. A clutch mechanism connects the gear-wheel with the reel. By means of a finger-piece on a shifting-lever, the reel may be freed or locked at will.

STREET-SWEEPER—ADAM C. A. DUPUY, New Orleans, La. In this street-sweeper a wheeled support is provided with independent compartments, each compartment having a section adapted to receive and hold refuse. A pocket-wheel adapted to take up stones is mounted to revolve in one of the compartments. A brush is mounted to revolve in the other compartment. The wheel and brush are located adjacent to the inlets of the receiving-sections of the compartments, so as to take up the dirt, dust, and stones. The brush and pocket-wheel are so constructed that they may be raised and lowered at will. In operating the machine but one man is required.

Railway Appliances.

TRUCK-LIFTER—WILLIAM J. DONALDSON, La Grange, Tex. With the wheel and axle, the journal-box and frame of a car-track are joined a flexible sling having grappling connections at its ends fastened at one end with the journal-box frame, and anchored at the other to move with the wheel in order to cause the rotary movement thereof to lift the journal-box from its bearing and simultaneously to hold down the wheel on the track. The invention is especially designed to be applied to loaded or empty freight-cars. The inventor states that, with this device, a truck can be lifted in but a fraction of the time formerly required. No screw-jacks, bars, or blocks are used. Manual labor is saved by causing the engine to do all the work.

CAR-COUPLING—JOHN M. LARKIN, Union, S. C. Connected with a chambered draw-head and with a jointed coupling-link securable therein, is a buffer-block at the front end of the draw-head, having a laterally-

widened transverse slot through which the link passes, the joint being located in the slot and being thus adapted to flex laterally. The coupling, it will be observed, is of the link-and-pin type, and is designed to take up shocks when two cars are brought together, and to permit a free lateral movement of the link when two coupling draw-heads are connected therewith.

TRACK-CLEANER—LEONIDAS R. SHELL, Richmond, Va. The tool provided by this inventor is mounted to swing toward and from a track and to project into the grooves, so that as the car moves along, snow, ice, and dirt will be removed. The cleaner consists of a rigid plate to which a scraper is attached, projecting downwardly. A flexible sheet is secured against the plate and has a brushing-tongue extending down at the rear of the scraper. A backing-plate is secured against the flexible sheet and has a downwardly-projecting tongue reinforcing the brushing-tongue. The scraper advances through the groove, dislodges foreign substances, and is then followed by the brushing tongue.

BLOCK-SIGNAL SYSTEM—WILLIAM L. STOCKTON, Trenton, Ohio. This block-signal system for electric railways provides a lamp at each end of the section. At the ends of the section, turnout track-switches are located. The wiring is so arranged that the lamp-circuit may be energized from the main current operating the car. A simple switch is also provided, which operates to close the lamp-circuit while the car is on the section between the track-switches, and to open the lamp-circuit when the car is on either one of the track-switches.

Miscellaneous Inventions.

BALL-CASTER—ALPHONSO H. COBB, Asheville, N. C. This caster is composed of a body having a flanged socket containing three balls. A stud is passed between the balls and is provided with a head to retain the balls in position. The article of furniture to which the caster is applied, being moved about, two of the balls will fall as soon as motion begins to the rear, until they bring up upon the outer rim of the socket. Friction will then be exerted upon the walls. The third ball works loosely because of space in front and overhead.

PESSARY-APPLIER—EDWARD A. BUTLER, Prescott, Arizona Territory. The applicator of this inventor comprises a barrel having one end beveled and flanged. A piston working in the barrel is provided with a packing and with a head beyond the packing. The head is in the form of a truncated cone having its sides inclined toward the beveled end of the barrel.

TILE AND TILE SETTING—CHARLES C. ALEXANDER, Bayonne, N. J. Two methods are employed in setting tiles, known in the trade as "floating" and "buttering." In the first method, the bed of cement used often cracks. In the second method, interstices are formed which harbor vermin and moisture. It is the purpose of this invention to provide a tile free from these faults. The tile in question is formed on its back edges with an annular rabbet, leaving a projection embedded in the cement, the rabbet being completely filled with the cement. When the cement shrinks, a pressure is exerted by portions thereof in an inward direction against the rabbeted edges, and thus the tile is securely gripped on all sides. The air is expelled during the setting process. Each tile is independent of its neighbors for support.

UMBRELLA RIB-TIP CUP—JOHN ALLESINA, Portland, Ore. This cup consists of an inner sleeve arranged to slide on the stick, and an outer sleeve rigid with the inner sleeve. The outer sleeve is formed so that it shall be of uniform diameter from end to end, is arranged to slide on the handle, and projects beyond the lower end of the inner sleeve, thus forming a channel for the reception of the rib-tips when the umbrella is closed.

TENT—HENRY O. FLIPPER, Nogales, Arizona Territory. A simple, light tent has been patented by this inventor, which tent is made of one piece of material. The canvas or other cloth used may be divided and two shelter-tents made therefrom, it being possible for the divided material to be brought together to form a pyramid tent, which may be opened at the front and at the back. When taken down, the tent may be carried by two men, although capable of sheltering four. The canvas is so shaped that it may be used as a wagon-sheet, as a blanket, or as a pack-covering, by hunters. When the tent is erected, portions of the material may be carried within to form a covering for the ground.

WAGON-BOX CLAMP—MACK A. LEITER, Sadorus, Ill. Connected with a bolster and a standard thereon, are braces running from the bolster to the standard. An arm extends through the standard and through the braces and projects from both sides of the standard. Clamping-rods pass through holes in the arm and have hook upper ends. Nuts on the rods engage against the under side of the arm. As the arm is held in the standard and the braces, it is evident that the clamping-rods can be drawn down tightly on screwing up the nuts, without danger of breaking the bolster-standard.

Designs.

DUST-GUARD SECTION—JAMES S. PATTEN, Baltimore, Md. Two design-patents were granted to this inventor. The first design has as its leading feature a plate with a curved edge and inwardly sloping grooves in the opposite edges. The second design consists of a plate having side arms, a curved surface at the base of the arms, and sloped ribs at the inner edges of the arms.

SKIRT-BINDING—CYRUS L. SULZBERGER, New York city. The five designs of this inventor are the result of an improved process of manufacturing bias velveteen, by which the fabric is improved in appearance and durability, and receives an added stiffness without losing its flexibility, thus enabling it to serve as a dress-stiffener.

GAME OR PUZZLE-BOARD—GEORGE S. O'FLYN, New York city. The puzzle provided by this inventor consists in turning over marked blocks of wood through one plane at a time, so that they shall finally rest in certain fields with their marked surfaces turned up.

MUFF—MAX W. JUDENFREIND, New York city. On the muff-body of this design a pocketbook has been secured in such a manner that the wearer of the muff can readily open the pocketbook whenever she may so desire.

NOTE—Copies of any of these patents will be furnished by Munn & Co. for 10 cents each. Please send the name of the patentee, title of the invention, and date of this paper.