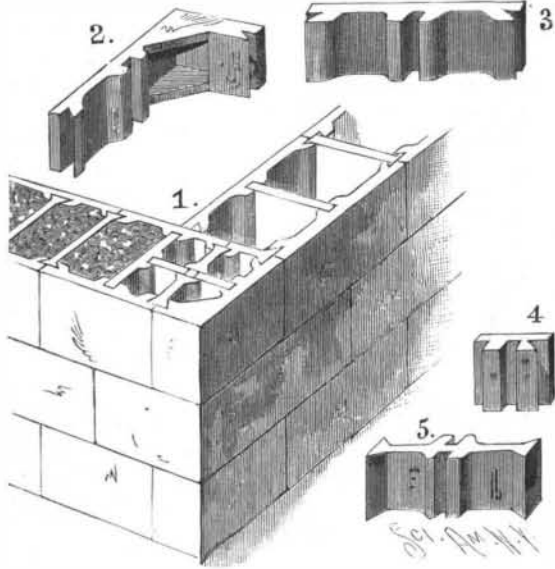


AN IMPROVED BUILDING TILE.

This is a very cheap building material, of which the parts may be easily moulded and the assembled tiles rapidly laid. The improvement has been patented by Mr. John Stewart, Jr., of Somersworth, N. H. Fig. 1 shows the improved tiles in place in a wall, a portion of which is filled in with concrete and provided with air spaces, Fig. 2 showing a corner piece, Figs. 3 and 4 side pieces, and Fig. 5 a cross partition and brace. The side pieces have on their inner sides ribs with inwardly inclined edges, to receive the dovetail heads or keys on the ends of cross tie pieces, and vertical parallel ribs to receive cross braces. To strengthen the corner

**STEWART'S TILE BUILDING WALL.**

piece, it has horizontal flanges or braces at the junction of the side and end, and an additional tie bar or brace extends parallel with the corner piece. For making half tiles, such as may be used in squaring up next the frames of windows, etc., a small side piece is used, as shown in Fig. 4. These tiles are substantially as strong as the usual hollow tiles, are proof against the depredations of vermin, and may be made to keep the interior of a building perfectly dry. The outside wall may be terra cotta or glazed tile, and the inside papered, painted, etc., or roughened for plaster, no studding or lathing being required.

SPECIAL TRIPLE GEARED LATHE.

This lathe has been specially designed for turning marine propeller shafts and heavy general work. We are indebted to the *Engineer*, London, for our illustration and the following particulars: The height of the centers is 30 in., and it admits 40 ft. between the centers. The driving is effected through five speed cones direct onto the face plate, and two series of double and triple gear, giving twenty-five speeds to the spindle, all properly graduated to suit the different diameters admitted by this lathe. There are two saddles, each having a set of duplex compound slide rests; and there is also a compound slide rest on the loose headstock for turning the coupling flanges, so

that five tools can be in operation simultaneously. The front slide rests are fitted with swivels for taper work. Further, each saddle is so fitted that by means of change wheels, tapers of any length and inclination can be automatically turned, this arrangement being of great convenience for turning the tapered ends of propeller shafts, gun tubes and similar work. The saddles and loose headstock can be rapidly adjusted on the bed by power motion, and throughout every convenience is provided for quickly manipulating the various motions in the lathe.

In all respects this machine is throughout of the most massive character, and it has been specially designed to take heaviest cuts possible. Its weight is about 60 tons.

The lathe was recently made by Messrs. Sharp, Stewart & Co., Atlas Works, Glasgow.

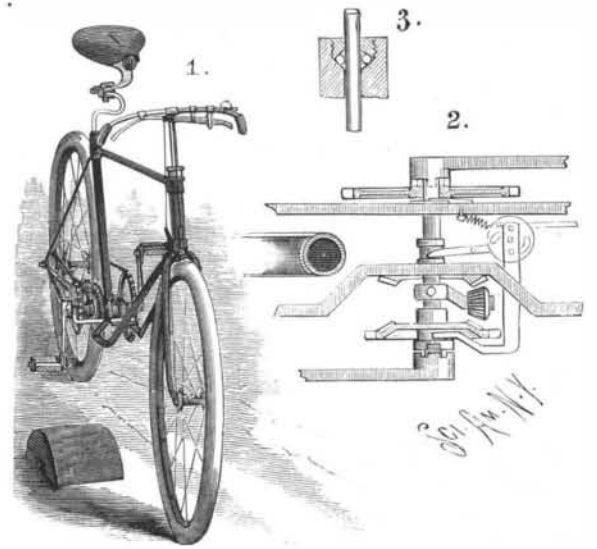
Molasses and Petroleum.

Almost all the molasses which comes from Cuba to the United States is brought in the same tanks in steamships that are used to carry petroleum as a return cargo. The ships' tanks are about sixteen feet deep and have a neck seven feet deep. They are pumped full of oil at Brooklyn or Philadelphia, then taken to Havana, and the oil is pumped out into the tanks of the refining plants there. Molasses is brought from the interior of the island in huge hogsheads, which are emptied into the storage tanks. A suction pump drawing about 10,000 gallons an hour fills each ship's tanks to within about two feet of the top, that amount of space being required for the expansion of the molasses. It might be supposed that the petroleum would have a bad effect on the molasses, but it has been shown that the contrary is the case, and as nearly one-half the importation is made into rum and the balance refined into sugar, a little oil is not of much account. The tanks are cleaned after the molasses has been pumped out by turning in a powerful steam jet, which washes down the sides and liquefies whatever molasses may be left in the bottom of the tank, and the suction pump finishes the work. A cargo of molasses, which formerly required ten or twelve days, can now be unloaded in forty-eight hours, while the difference in cost of handling, to say nothing of the saving of time, amounts to a large sum. Since the present system of dividing a vessel's hold into tanks was devised and put in practice on steamers the profits of the trade and the steamship companies have largely increased.—*N. Y. Tribune.*

AN IMPROVED BICYCLE DRIVING GEAR.

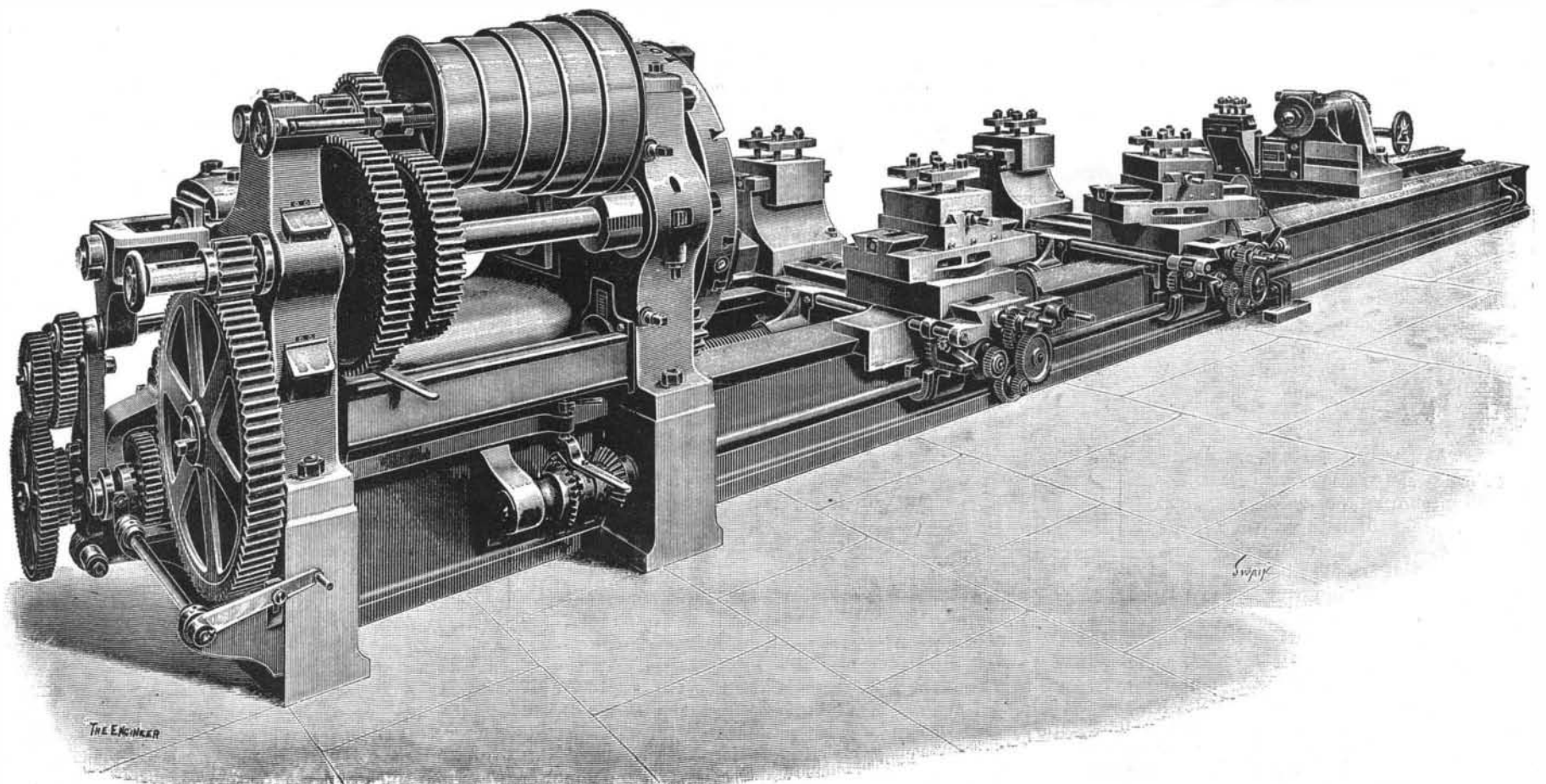
This is a simple and convenient differential gear mechanism for application to an ordinary safety wheel, to change at will the speed and power of the machine without dismounting. The improvement has been patented by Messrs. George B. Robinson and William R. Roby, of Colorado Springs, Col. Fig. 1 shows a bicycle provided with the improved gear, Fig. 2 being a sectional plan of the gear, and Fig. 3 illustrating one of the ball bearings of the pedal shaft. The lower portion of the frame is provided with a brace having an inwardly bent portion in which slides and rotates the pedal shaft, the cranks of which have at their inner ends hubs secured to the

shaft, these hubs having on their inner faces clutch teeth adapted to engage sprocket wheels of two sizes on opposite ends of the pedal shaft. One of these wheels has on its inner side a beveled gear adapted to engage a pinion journaled on the free end of an arm secured to the shaft, the pinion also engaging a beveled gear wheel fixed to the bent portion of the brace, so that when the shaft is revolved and the pinion is in mesh with the gear it has a movement around the shaft and also turns rapidly on its own axis by reason of the contact with the gear wheel. When the pinion, therefore, is in engagement with both the gear wheels it has a greatly accelerated movement,

**ROBINSON & ROBY'S BICYCLE.**

causing one of the sprocket wheels to turn twice to every revolution of the pedal shaft. The machine has two drive chains, one connecting with the larger sprocket wheel on one end of the hub, and the other with the smaller wheel on the other end, and the changes from one gear to another are effected by means of a lever fulcrumed on the handle bar, the latter being provided with three hooks, one above another, and the placing of the lever in either of the three positions effecting a corresponding change of the gear. With the lever resting in the lower hook, the machine has the normal speed; for a slower speed and greater power, as in going up hill, etc., the lever is lifted into the second hook, while, when great speed is required, the lever is lifted into the third hook, all the changes being made without dismounting and without materially slackening the speed of the machine. Fig. 3 shows the ball bearing of the pedal shaft, which has a longitudinal movement. The gear mechanism is preferably covered by guards secured to the frame and brace, one of these guards, as shown in Fig. 1, lying under the machine.

THE forced draught or the supply of air under pressure to steam boilers was the original invention of the late Edwin A. Stevens, of Hoboken, N. J., and was patented by him April 1, 1842.

**IMPROVED TRIPLE GEARED LATHE.**