

A MOTOR LAWN MOWER.

Those of our readers who look for an early coming of the horseless age will see another sign of its approach in the ingenious machine which forms the subject of our illustration. The ordinary horse-propelled lawn mower used in our parks and larger lawns and on the various recreation grounds is open to the objection that the horse tramps down the grass, especially when it is wet or tender. In the motor mower there is nothing to interfere with the grass before it passes under the cutters, and the great weight concentrated on the three rollers of the machine rolls out the imperfections and leaves a solid, even sod—a valuable feature, especially in golf or other recreation grounds.

The frame of the main body of the machine rests upon three rollers. The first two are the main driving rollers, and the third, which is the rear and covers the stretch of grass left between the former, works as a caster or steering roller. For this purpose a wire rope is fastened to each end of the caster yoke and is carried round a wheel at the lower end of the steering shaft, at the front of the machine. The main frame carries an upper platform on which are placed the gasoline engine and tank, the front of the platform serving as a seat for the driver. The engine is of four horse power, and in a recent test when the mower was loaded with eight men it moved freely on the level, and with three men on the seat it ran up slopes of considerable inclination.

The main shaft of the engine is geared to a countershaft by means of a chain and sprockets. On the countershaft are two friction clutches, one of which carries a sprocket which is geared to a sprocket on the roller shaft. This clutch is in engagement when the machine is running forward. The other clutch is provided with gear which reverses the motion. The two driving rollers run loose upon the driving shaft and are connected to it by two ordinary clutches which are automatically disconnected from the driving shaft when turning curves. The clutches work on feathers on the main shaft, and they are shifted by means of levers whose outer ends engage a quadrant projecting from the back caster yoke. When the caster is moved either way out of a straight line, the quadrant throws out one or other of the clutches and holds it clear until the motor is running again in a straight line. The revolving cutter frame is made separate from the main frame of the machine, to which it is hinged at the front end. It is driven by a sprocket chain directly from the engine shaft. By means of a lever and connecting rod placed to the right of the operator the cutter frame may be lifted from the ground and folded back against the front of the main frame of the machine. The movements and speed of the motor mower are entirely controlled by means of the two hand wheels in front of the operator's seat.

We are indebted for our particulars of this interesting machine to the inventor, Mr. Thomas Coldwell, of Newburg, New York.

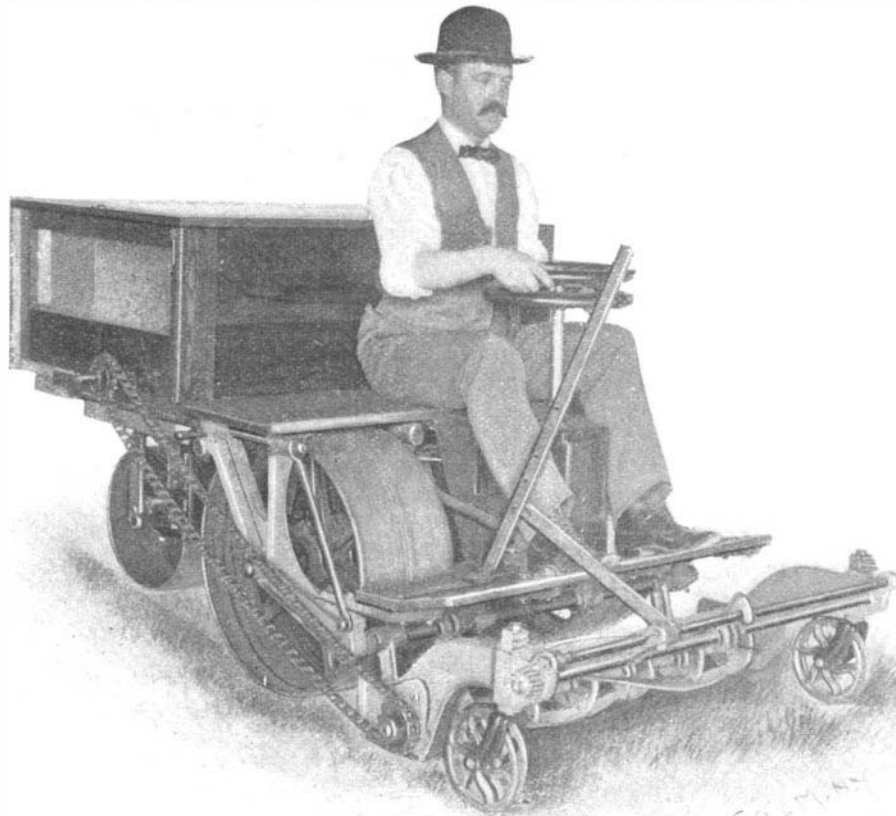
Ancient Wealth.

It would be polite fiction to assert that everybody who looks upon the great monuments of antiquity, the Pyramids or the Coliseum, for example, thinks of the cost, and wonders where the money came from. But when, by chance, a learned person suggests the inquiry, only an idiot, says the London Standard, fails to be struck for a moment. It is so curious that while modern states, with all the accumulated wealth of the antique world at their backs, and the treasures of Mexico, California, Australia, the Transvaal, in addition, have to consider ways and means with anxious care before building a government office, the early monarchs raised palaces and temples by the hundred at will. The thoughtless have ready explanation—slave labor did it all. But, in the first place, the slaves had to be procured somehow—by war or purchase—and either means was expensive. There is a reply to that objection equally facile—the war paid its own cost in loot. But this only leads us a step backward. The loot must have been enormous, and where did it come from? In the second place, those slaves had to be fed, and, however cheap their rations, the sum total must have been immense when such vast numbers were employed.

But captives of war could only do rough work. They might build the Coliseum or the Pyramids, directed by an army of skilled craftsmen. But the sculpture of Assyrian palaces, the painting of Egyptian temples

and tombs, must have been effected by artists, probably free, or, if slaves, trained at great expense. When we read that the city of Dur-Sargunu was created on an empty plain, by order of the king, in eight years, standing on a mound of brick 700 acres in area, its walls sixty feet high, broad enough for seven chariots to run abreast, and faced with stone, all the evidence is needed to make us credit the story; but the marvel becomes far greater when we observe the miles of sculptured stone that decorated Sargon's palace with colossal bulls on each side of every doorway. No unpracticed hand carved those reliefs. They are the work of artists, not made for sale when wanted, but to order, each slab telling its fragment of the royal annals. Were all the sculptors of the empire summoned to this task, to be finished in eight years? But the tombs of private individuals in Egypt must have been painted at the cost of the family by masters of the craft. Animals and birds show a skill not to be surpassed. We may be quite sure that work like this was highly paid—by comparison, that is, with slave labor.

So the question recurs, How much gold and silver did these ancients possess? In the Roman time men appear to have been struck with the evidence of vast wealth displayed by their predecessors, such as the Cæsars could not equal. But they escaped the difficulty with ease, by granting them riches literally beyond the dreams of avarice. Dr. Arbuthnot, for example, has patiently reckoned up the amount of treasure heaped upon the pile of Sardanapalus by Athenæus, and he finds that it came to £16,953,120,000

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in our money at the least; for if a computation which Athenæus himself suggests be admitted, the total would be about twice as large. After this, the statement of Diodorus that the Pharaohs counted upon a revenue of £133,000,000 annually from gold mines in the Bishari Desert, and drew an equal sum by taxation, is very moderate. But when the same most valuable writer—who talked nonsense only when he repeated the words of other men—comes to deal with Babylon, he lets himself go. There was a gold statue of Zeus—the Greek assigned his own gods to Babylon as usual—forty feet high; of Rhea equally tall, with a lion of gold at each knee, and silver serpents to correspond; Juno weighed 500 talents; in front of her was a golden table, 500 talents, upon which stood two cups, 300 talents each, and three bowls, 1,200, 600, and 600 talents. These ornaments of a single temple represented about £11,000,000, and the building was covered with gold plates. It has been calculated that the statue of Nebuchadnezzar mentioned in Daniel would be worth three and a half millions sterling; that the treasure left by David amounted to a hundred and fifty millions in gold, two hundred millions in silver; but the value of the Hebrew talent is doubtful. We are told that Pytheus, seemingly a private gentleman of Phrygia, entertained Xerxes and all his army—"with most sumptuous feasts," too—and then had £4,770,000 left, or, as some compute, £3,600,000. The tale of Alexander's loot is most wonderful of all, and that is historic. If we entertain doubts, it is futile to express them when the statements are so clear and the means of disproving them absent. In the Persian camp then, and at Babylon, Alexander secured something like £70,000,000; at Persepolis, £180,000,000; at Pasargurda, a trifle of £9,000,000; at Ecbatana, £270,000,000; say

£550,000,000. And Darius carried off £9,000,000, which his murderers seized.

We come to the prosaic facts which have been collected by several patient inquirers from a note or a hint here and there. Of Egypt, indeed, nothing profitable can be said until the age of the Ptolemies, and little even then. The Pharaohs certainly drew a considerable revenue from their gold mines, and a multitude of inscriptions show them receiving tribute of the precious metal from Ethiopia and Syria in the days of their supremacy. Before and afterward the people were great manufacturers and traders. Ptolemy Philadelphus left £50,000,000 at least in his treasury. Herodotus tells us the revenue of the Persian Empire, under Darius Hystaspes, and the moderation of the sum is assurance that he obtained his figures from a competent authority—it was about £3,250,000; but this was cash alone. Solomon's revenue is said to have been far greater—over £7,000,000 in gold, and as much in silver; but it has been mentioned that Hebrew talents cannot be computed with certainty. That with such an income the Persian monarchs could contrive to hoard the amazing treasures captured by Alexander has often been questioned; but we may suppose that the revenue had increased vastly since Herodotus wrote, and that the taxes in kind and the tribute yielded far more than the returns in cash; and the plunder of Egypt, northern India, Syria, and countless nations must be added. We are told, indeed, that the Macedonian loot represented the accumulation of ages. But it is a relief, as ever in such cases, to get to Rome, where dry facts prevail. Pliny remarks that the treasury had contained over £70,000,000 more than once. This is a reasonable figure. When Augustus had organized the public service, and ascertained precisely what the receipts and expenses of the empire might be, he found that the annual income was about £40,000,000, and he declared that it left a very small balance "to the good." But Cæsar had private resources for any extravagance he might fancy.

Augustus was no tyrant, but people reckoned that during his lifetime he received no less than £32,000,000 by legacy from friends. The savings of Tiberius amounted to £21,500,000, which again is reasonable. Caligula spent all this in a twelvemonth. Some private fortunes may be given: Crassus had about £1,600,000 in cash, and lands to the same value; Seneca, £2,450,000; Lentulus, the augur, £3,250,000. When the villa of Marcus Scæurus was burned, they said that he lost over £800,000. Julius Cæsar declared after the expenses of the prætorship that he was worth £2,200,000 "less than nothing"—owing that sum, with no assets. Upon the other hand, the latest authority who has pondered

this interesting question, M. Obreschkoff, concludes that all the money in use at the beginning of our era was but £300,000,000 in gold and £546,000,000 in silver. At that rate Darius Codomanus must have had two-thirds of it in his own hands. This is not so grossly improbable as it seems. His predecessor had sucked all the universe worth sucking. And curious evidence might be given of the excessive rarity of gold in Greece.

A SIMPLE experiment for determining the source of the rays from a "focus" tube is described by Dean Molloy in the Scientific Proceedings of the Royal Dublin Society (vol. viii, part v, 59). Dr. Molloy took a deal board measuring seven inches by five, and into it drove fifteen slender nails in three rows of five. This was attached to the back of a fluorescent screen mounted on a stand so contrived as to allow of the apparatus being revolved in a circle about the focus tube, with the screen always tangential to the circle. By noting the directions of the shadows of the nails, the exact position of the source of radiation could be determined. On adjusting the focus tube so that the central nail pointed toward the platinum plate in all positions of the screen, it was found that this nail gave only a black spot for its shadow, the shadows of the other nails radiating symmetrically from this spot as a center. It followed that the source of radiation was in the line of the central nail produced, and was thus shown to be at or about the center of the platinum plate. Dr. Molloy then proceeded to determine the size of the area of radiation by means of a pinhole image, and found it to be an irregularly circular, ill-defined patch about a quarter of an inch in diameter, coinciding with the patch which first begins to glow when the current is turned on.