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## A BOOKBINDER'S SEWING MACHINE.

The Singer Manufacturing Company have recently adapted the principle of their sewing machine to the stitching of books and pamphlets; and we publish herewith an engraving of the book-sewing machine, in which all the parts are represented with such clearness that little explanation is necessary. The sheets of printed paper are first folded and then passed into the machine in succession. The attachment for effecting this is shown in our illustration; and it stitches the sheets, feeds them forward, cuts the thread, and conducts the sheets along downwardly inclined guides, so that they fall between two rolls, which fold and smooth them. The machine is capable of stitching sheets of any size or thickness; and how ever thickly the sheets may be folded, the rollers will give them the proper pressure, being united by an elastic connection which allows all thicknesses to pass through under their pressure.

The machine stitches the sheets with great rapidity; and as each sheet is stitched separately, the binder can get the sheets ready for binding as fast as they come from the printer, the sheets being afterwards collated for insertion in the covers. Much time is saved by this method, as every one familiar with bookbinding will acknowledge; and the separate threads to the sheets insure elasticity to the back, which allows the book to open easily, and so contributes in an important degree to the durability of the binding.

## New Pavement.

A new kind of pavement has recently been laid in Newgate street, London; it has not been used for any roadway previously. About 300 superficial yards have been laid down at the west end of Newgate street. The following is the engineer's report on the material: "That the asphalt is stated to be composed of 85 per cent of fine ground granite and 15 per cent bitumen; that it is a material free from slipperiness and not affected by the atmosphere. It is laid in a heated, semi-fluid condition, two inches thick, upon a foundation of Portland cement concrete nine inches thick."

## Construction of Petroleum Tanks.

Storage tanks, whether built by private enterprise or constructed in the interests of the pipe lines, are necessarily of iron. They must needs be of some such material in order to resist the pressure of enormous quantities of fluid intended to be stored within them. Their contents vary all the way from 8,000 or 9,000 to 25,000 barrels of 42 gallons each. These tanks are constructed of heavy iron, riveted

together and made fluid tight in the usual boiler fashion. The first step, after the bed has been made by carefully compacting and leveling the ground on which the tank will rest, is to lay out the sheets which are to constitute the bottom on wooden horses properly arranged in the bed. These bottoms are then riveted together until a vast iron disk of the required diameter is produced: the diameter in the case of a 20,000 barrel tank, for instance, being about 80 feet. It is calculated in a rough way that the bottom of the tank, with the first ring of siding attached, is chargeable with half the cost of the whole tank. This first ring is attached to the bottom by means of a number of L-shaped pieces, to

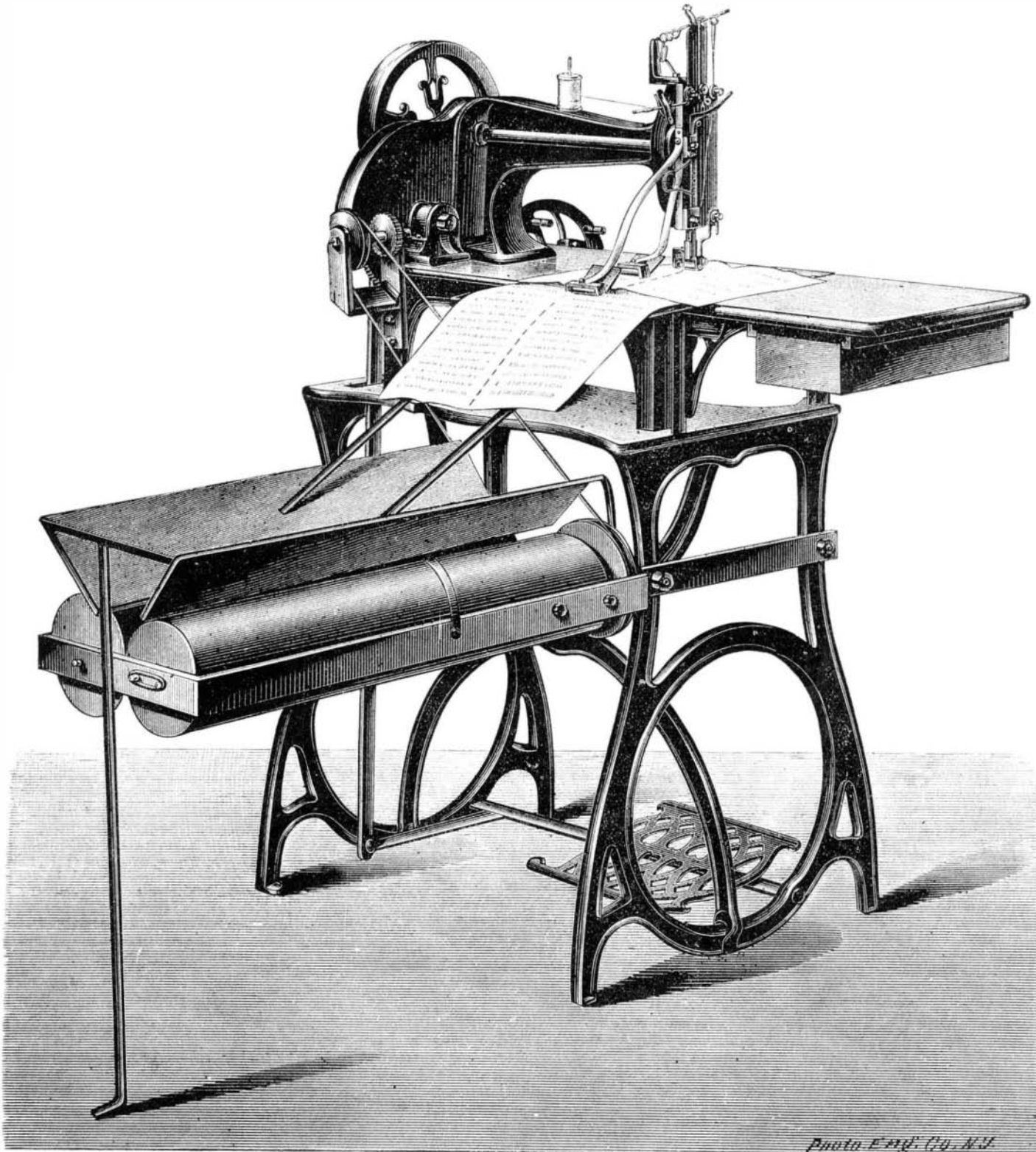
vagrant grass seeds taking root, the roof presenting somewhat the appearance of turf. These are the earth tops.

Every roof has a manhole, generally upon the principle of an ordinary house scuttle. It affords access to the interior of the tank for cleansing and other purposes. There is a supply pipe which runs up the side of the tank and enters at the top, near the manhole. About an inch or so above the bottom, one or more drawing-off pipes are inserted. Access to the roof is secured by a wooden ladder or steps; these are generally permanent attachments. Across the roof, be it of wood or iron, a slatted or cleated wooden walk is provided, so that the roof may not be injured by

being trodden upon. Sometimes, if tanks are near together, their roofs are connected by wooden bridges or plank ways, that easy access may be had to all. Sometimes the base of tank is earthed up for three or four feet with sloping banks of gravel.

Sometimes a trench two feet in depth is dug about the base, with an opening towards the downwards slope of land. When the tank is completed, it is subjected to an hydraulic test; water to its full capacity is pumped in; and if the tank bears this strain without either bursting or leaking, it will of course withstand the pressure of an equal quantity of oil. Occasionally the water pressure proves too strong, particularly if the iron has not been of a good quality. The tank, now completed, receives its contents through the supply pipe the oil coming through, it may be, miles of piping, either direct from the wells or from other tanks or from barges laden with the oil in bulk. In this way the oil-producing country is threaded with countless miles of piping, sometimes above ground, sometimes on or beneath its surface, and sometimes in the beds of rivers.

Some tanks are on the tops, others on the sides or in the hearts of mountains, others at their base. Sometimes they cluster together in particular localities by the dozen. Frequently we find knots of tanks, only from five to ten feet apart: hence all morally certain of destruction by the fire that seizes upon anyone of them. On the other hand, where wiser foresight has prevailed—as on the Anchor Farm, Chestnut Hill, opposite Parker's—it is made obligatory upon tank owners to build at least 200 feet apart. There are twelve tanks upon the summit of this hill. At Mount Nebo, just south of Parker, there are ten tanks separated by distances varying from 100 to 150 feet; while at Montrose there are ten new tanks being built on the river bank, separated from each other by only fifty to seventy-five feet.—*W. S. Newall.*



THE SINGER BOOK-SEWING MACHINE.

which these parts are respectively riveted. The remaining rings are attached or built up in the usual boiler fashion. At the proper time the wooden bases are withdrawn; and by means of jack screws or some similar device, the tank is let down upon its earthen bed. The roof is either of iron or of wood. Iron roofs are sometimes constructed of something akin to ordinary roofing metal, properly supported by a frame within, if the tank be small; but if it be large, the roof is generally constructed of heavier sheets, riveted together. The vast majority of tanks have wooden roofs. Out of 85 examined recently, only 18 had iron tops. Wooden roofs are generally tarred and graveled. Sometimes, instead of being flush with the top of the tank, they are set some inches below it, forming a water top intended to hold water. Sometimes they are covered with earth, in which