

**MULTIPLE DRILLING MACHINE.**

We illustrate a special drilling machine made by Francis Berry & Sons, of Sowerby Bridge, England, this machine having been specially arranged, says *Engineering*, for the use of manufacturers of vertical and horizontal boilers, steam cranes, portable engines, etc.

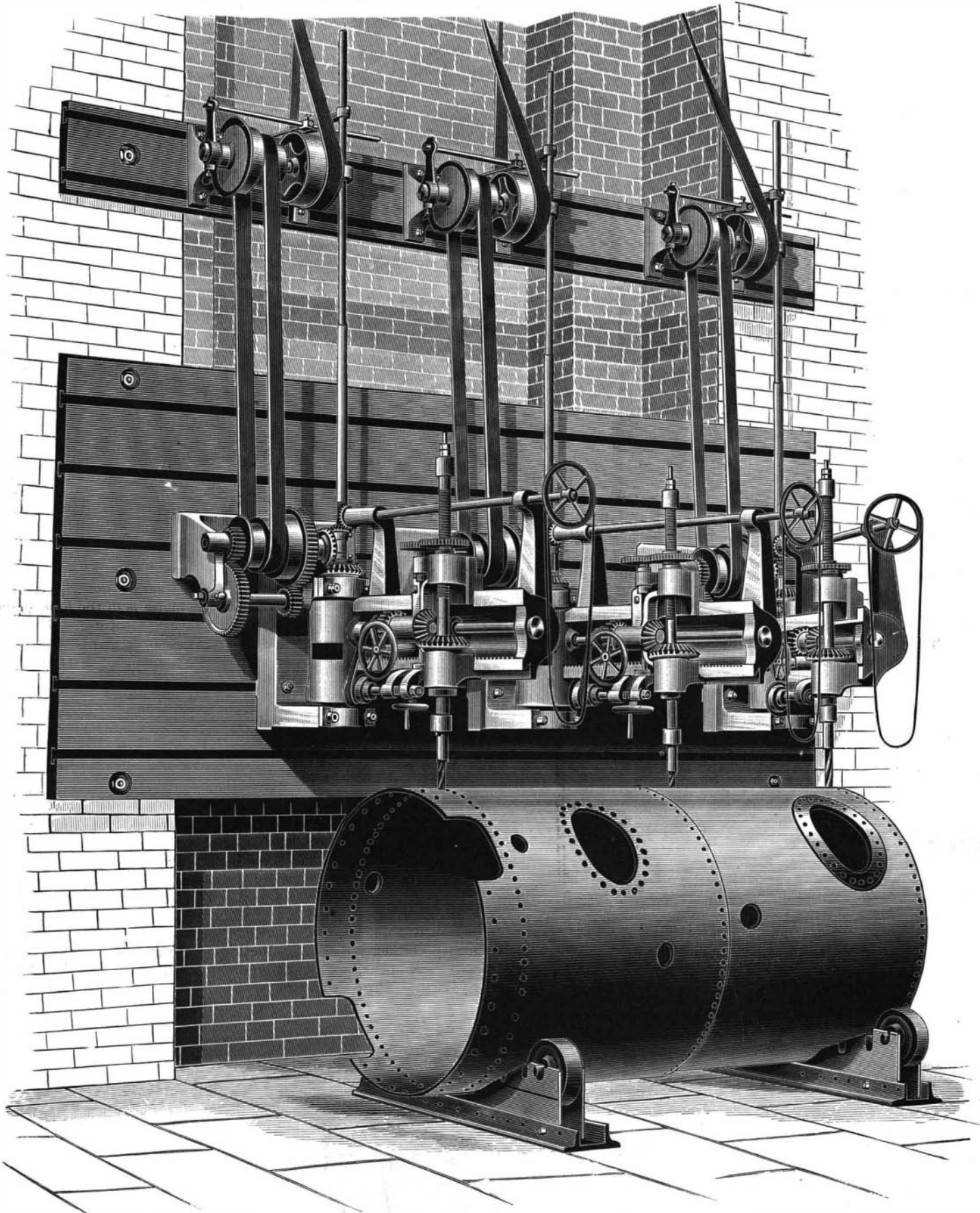
As will be seen from the engraving, the machine consists of three double-gear radial drilling machines, each with a radius of 4 feet, each radial arm having a steel spindle 2 inches in diameter and a self-acting and hand feed range for a depth of 12 inches. These drills are bolted to a cast iron wall plate 14 feet 6 inches long by 6 feet 8 inches wide, planed perfectly true, and with six T slots, equidistant, planed out,

The frequency of accidents and loss of life arising from car-heating stoves is awakening public attention everywhere, and even railroad officials are beginning to realize the necessity for some safer means of warming their cars than are now in use. The heating of cars by steam from the locomotive would seem to be the most effective and the least objectionable method; but railroad engineers are almost unanimous in their condemnation of the use of steam for the purpose.

Mr. Chauncey M. Depew, President of the New York Central Railroad, in a recent interview said, in substance, that steam could not be used on long trains or for long distances.

Mr. Frank S. Bond, Vice-President of the five thousand miles of Chicago, Milwaukee, and St. Paul road,

coal stove, inclosed in a wrought iron case, kept securely fastened, was the safest and best plan yet devised for heating. The Pullman Car Company have adopted this mode of heating on most of their drawing room and sleeping cars, and they have probably given the subject as much thought as any one. But, says our informant, there is another element very slightly less dangerous than the car-heating stove, and that is the lighting appliances used in all passenger cars. The reservoirs of the several lamps contain considerable oil or other inflammable substance, and, being suspended along the length of the car, some one or more are likely to be crushed in even a slight collision, and the danger from this cause is one that has not received the attention it deserves. Electric lighting and steam heating,



IMPROVED MULTIPLE RADIAL DRILLING MACHINE.

and running from end to end. This plate carries the three drills, and by means of the T slots these drills can be moved into various positions, either vertically or horizontally, within the limits of the plate, to suit the work to be operated upon.

The top driving apparatus is also bolted to a wall plate with T slots from end to end, so that the driving apparatus can be moved along to suit the varying position of the drills.

**The Car Heating Problem.**

The recent accident at White River Junction has caused the passing of a resolution in the Connecticut Legislature, asking that the Committee on Railroads be instructed to make a thorough examination of the methods employed in heating railroad cars in that State, and report whether legislation is necessary to secure greater security to the public.

confirms Mr. Depew in his statement. Mr. Depew, further referring to the difficulties attending car heating, said that wealth awaits the man who invents a remedy. He had thought of fireproof cars, but concluded that they would not satisfy the public, for they must be constructed without much ornamentation, and "I know by experience," says Mr. Depew, "that the pampered public will take the chances of burning to death in a luxuriously upholstered coach which holds \$10,000 worth of inlaid woods, linacrusta-walton designs, ornate carvings, frescoes, velvet carpets, and portieres, rather than insure their lives in a plain iron car that no incendiary could destroy."

In conversation with a railroad official of Providence, he tells us that car heating has been a subject of much study and many experiments in the construction departments of most of the important railroads, and it has heretofore been claimed by the companies that the

by means practically available under the present conditions of railway business, are among the most important problems at present inviting the attention of inventors.

As the adoption of fireproof cars has been suggested, we find, as long ago as 1851, Thomas E. Warren, of Troy, N. Y., planned a metallic railroad car, which was illustrated in the *SCIENTIFIC AMERICAN*, August 23, 1851, vol. vi., p. 388, and the cut represents the car to be very graceful, equal in form and ornamentation to most passenger cars of to-day. We copy from the description accompanying the engraving: "The posts are made of wrought iron plates and constructed tubular, thus combining great strength and extreme lightness. The panels are of lighter wrought iron plates than the posts, and the roof is of sheet iron. The car is lined with a non-conducting material, so as to render it cool in summer and warm in winter."