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## Collecting and Removing Scums from Boilers.

Our engraving illustrates a simple and undoubtedly effective device for removing scums from boilers, which has, we are told, proved its efficacy and value in a five months' practical test on the steamship *John Gibson*. Upon inspection of the boiler in which it has been used, it was found that no scale had collected on the tubes, and only a slight and easily removed scale had collected on other parts.

In a trip between New York and Washington, with the cock kept a quarter turn open, it is stated that the salt saturation was kept within limits by its use.

The principle of drawing off scums from the surface of water in boilers, by means of a surface blower, is not new. The inventor of the present improvement rests his claims upon something beyond this, namely, the form of the collector and its position in the boiler at the point to which all the surface circulation tends. It is obvious that if, at this point, a device be placed that allows the free descent of the water while it obstructs the motion of the scums, the latter will gather in the collector, from which they can be forced out under pressure through a tube provided for that purpose.

This is claimed to be the action of this surface blower, the parts of which are as follows:

A is a perforated globe put together in halves, which are connected by lugs and bolts, B. C is the eduction pipe, and D the cock.

The engraving shows the device as applied to a marine boiler, and placed in the focus of surface circulation. It is scarcely necessary to add that the same appliance may be used in any boiler, when impure water renders it needful.

Patented through the Scientific American Patent Agency, March 5, 1872, by B. C. Davis and J. T. Hardester, Baltimore, Md.

For further information address Phillips & Calverley, No 444 Water street, New York, or Holmes & Co., 72 West Pratt street, Baltimore, Md. The former are the agents for New York State, and the latter for the State of Maryland.

## BRIDGE OVER THE MISSISSIPPI, AT BRAINERD, MINN.--NORTHERN PACIFIC RAILWAY.

Our engraving is a fine view of one of the bridges of the Northern Pacific Railway, a work which is now being pushed with energy, and is destined to become a most important ar-

tery of commerce. The bridge is, we think, the northernmost of all the bridges that cross the great Mississippi, which, at this point, however, is a narrow and easily spanned stream.

The bridge, in itself, has no peculiar points calculated specially to interest engineers. It is of plain trestlework, yet over it will pass an enormous traffic; and as a view of one of the features of a magnificent enterprise, our engraving possesses interest.

The road follows a natural line of commerce, which must, in time, develop into something enormous. It penetrates a region remarkably productive, into which civilization is crowding even in advance of the construction of the railway. This country has been appropriately called the "Garden Region" of the North. As a wheat producing region, it is pro-

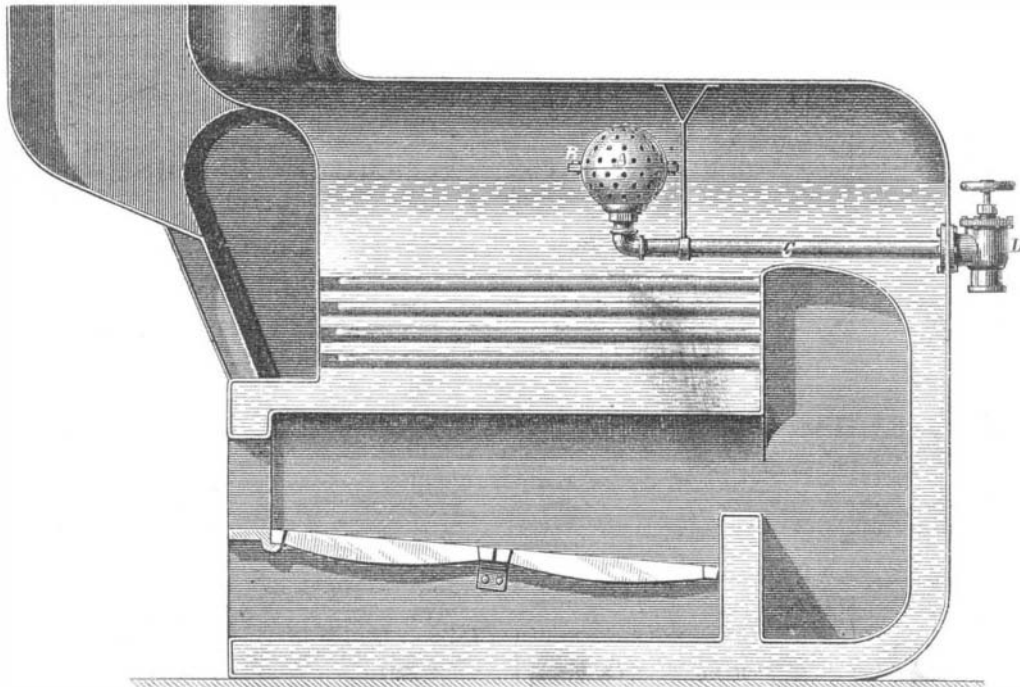
River of the North, and trains are running regularly. The Dakota division, extending 200 miles westward, from the crossing of the Red River to the crossing of the Missouri in central Dakota, is now under construction, and contracted to be finished July 1, 1872. In the meantime, a section of 65 miles is building between the Columbia river and Puget Sound, in Washington Territory, where track laying is progressing.

The Northern Pacific company, in order to remove hurtful rivalry and secure early and direct connection with St. Paul, Chicago, and the East, recently purchased the main line and branch of the St. Paul and Pacific road. During the past year the main line has been completed, through an excellent country, to Breckenridge on the Red River. At the

same time the branch has been extended from its late terminus at St. Cloud, 65 miles northward, to Brainerd, where it joins, and becomes tributary to, the trunk line of the Northern Pacific. Finally, contracts have been let for the construction of a branch road (to be technically known as the St. Vincent Extension of the St. Paul & Pacific Railroad), from St. Cloud, 375 miles, to Pembina, near the northwestern corner of Minnesota, and on the border of the British Province of Manitoba. This is to be completed before the close of 1872. It will drain the richest portion of the Red River valley and open direct communication with the British settlements of Winnipeg and the productive valley of the Saskatchewan. It will also serve as the southeastern arm of the Northern Pacific road, reaching to St. Paul and Minneapolis.

At this date, the Northern Pacific company own, by construction and purchase, 640 miles of finished road. The completion of the above named contracts will give the company, at the close of 1872, more than 900 miles of completed track in the pro-

perous State of Minnesota alone, and 1165 miles altogether; it will carry the trunk line nearly one third of its distance across the continent, and bring to it the large and profitable traffic of Montana and the Government transportation of the Upper Missouri. The Hudson's Bay Company have already leased wharves and warehouses at Duluth, preparatory to doing the whole of their large business over the Northern Pacific line. Nearly two million acres of the company's lands in Minnesota are ready for sale, and many thousand have been sold to colonies and settlers, who are moving to the line of the road in gratifying numbers.

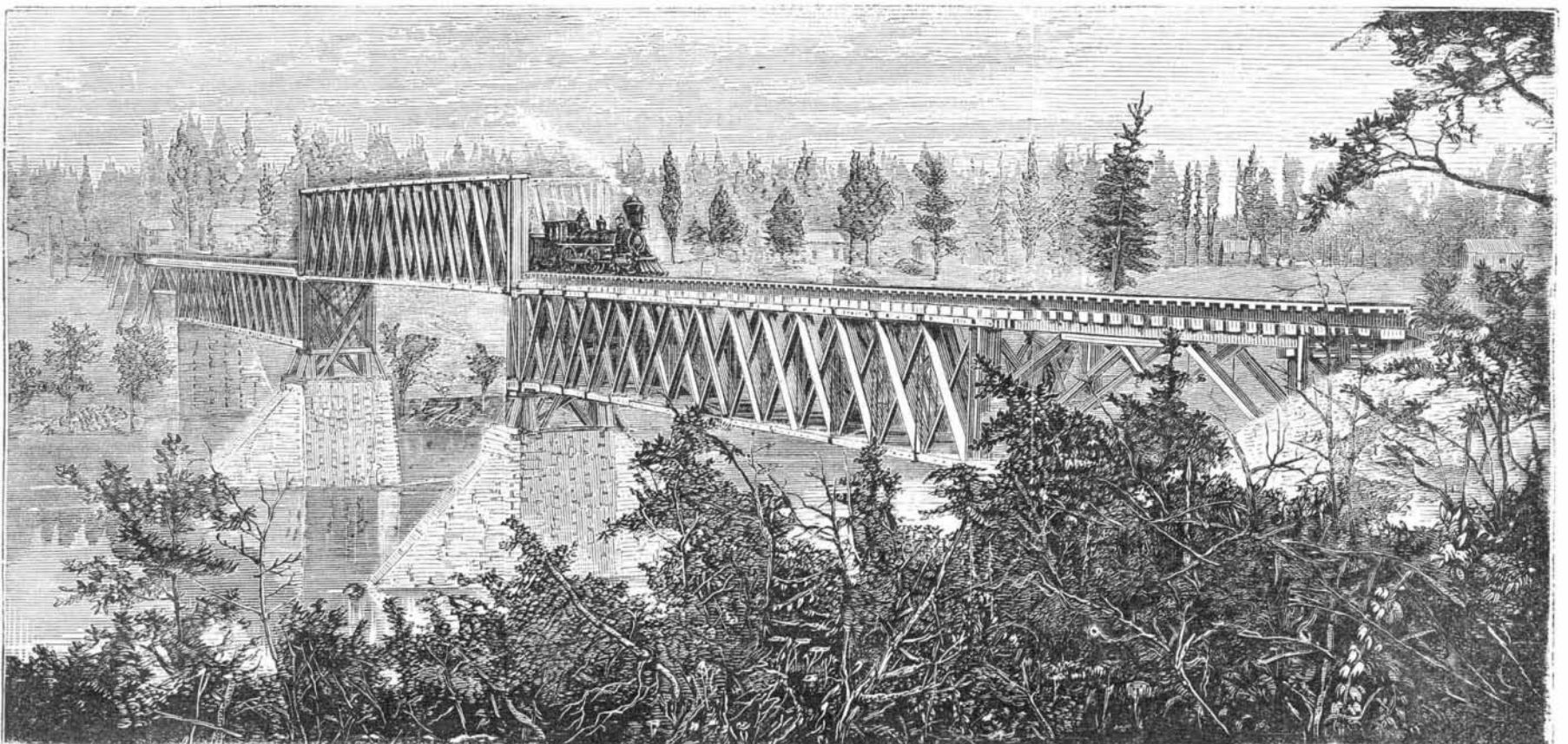


DAVIS AND HARDESTER'S SURFACE BLOWER.

bly unsurpassed anywhere, and fruits, of nearly all the kinds natural to the temperate zone, thrive in the mild climate of its luxuriant valleys.

All the elements of prosperity exist in the territory which will supply the road with traffic, namely, Minnesota, Dakota, Montana, Idaho, Oregon, Washington, and a part of Wisconsin, and a brilliant future for this work cannot be regarded as doubtful.

According to statement of Messrs. Jay Cooke & Co., (December 25, 1871,) this road is now completed across the State of Minnesota, 255 miles, from Duluth to Fargo, on the Red



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