Correspondence.

A Sod Bridge for the Platte River.

To the Editor of the Scientific American:

For various reasons, which will readily suggest themselves to the minds of your readers, a method for easily and cheaply bridging the Platte River (a wide and almost useless stream) is a great desideratum. The plan which I herewith inclose goes far to meet that "long felt want." Not only that, but it contains also the germ of a plan for converting an unprofitable river into a profitable canal.

DESCRIPTION OF DRAWING.

A, B—The banks of the Platte River, ordinarily not more than three feet above low water mark.

C, C—The prairie valley, covered with a tough, thick sod.

D, D—The bed of the river—shifting sand, several feet deep, resting on a firm substratum of gravel hard-pan. The river bed is very wide east of the junction of the South and North Platte, probably averaging one mile in width; and presents the appearance, during the greater part of the year, of a number of narrow, shallow water ways running through a vast sand bed.

E, E, E, E—Roadway approaches and abutments, built up of sod cut from the adjoining prairie valley.

F, F, F, F—Sheeting for the protection of road walls and abutments.

G—An iron bridge to cover the central third of the width of the river bed. The sod approaches complete the remaining two-thirds.

CHANGES WHICH THE CONSTRUCTION OF SUCH A BRIDGE WILL PRODUCE.

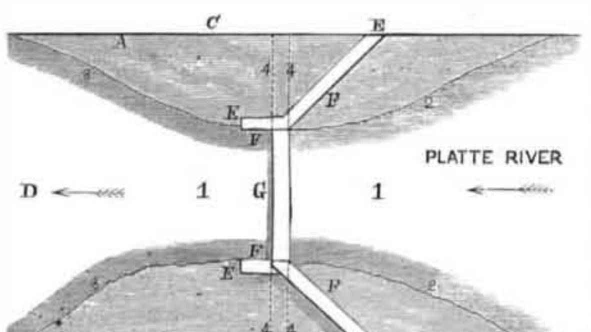
1. The increased force of the compressed current will cut out the loose sand between the abutments and deepen the channel at that point to the hard substratum of gravel, at 1, 1. Thus an ample waterway will be afforded for even the highest stage of water and ice.

2. A permanent deposit of sand will be made above the roadways, inside the dotted lines, 2, 2.

3. Permanent deposits of sand will also be made within the lines, 3, 3. These deposits will fill the whole space included between the sod walls and the river banks, and within three or four years will be very firm and overgrown with willows.

ADVANTAGES OF THIS METHOD OF BRIDGING THIS RIVER.

Economy, Efficiency, and Stability.—This not being a timber country, all timber for bridge building must be freighted a long distance at heavy cost; and bridge timber soon decays. Timber bridges, in this State, are expensive to build and expensive to keep in repair. The first cost of iron would be greater than that of timber, but it is practically imperishable, and not much of it would be needed. The annual expense for repairs to an iron bridge would be nominal. Sod



would cost nothing but the hauling, and no skilled labor would be needed in building the roadway approaches. Once up they too would be permanent, expenses for repairs would be nominal, and restrictions of speed in driving on them could be dispensed with. The *first* roadways will be more safely built at an angle to the descending current, the impact of which on the bank will be thus much lessened. After the lapse of a short time (not longer than three years) the *second* approaches can be built, cheaply and easily, on the "made land," straight from the river banks (that were) to the ends of the iron bridge, as at dotted lines, 4, 4, 4, 4.

Experience proves that sod is a useful and thoroughly efficient material for the purpose, and in the way I have pointed out—and that the physical changes I predict are produced by the causes mentioned. That experience was gained by an attempt to build a sod bridge across the Platte, within the limits of this county—an attempt which only failed for lack of energy and business capacity on the part of the projector, at least so it is said. Certainly the sod walls erected years ago are comparatively intact by the action of the water, and on the lower side of them is a considerable tract of "made land," overgrown with willows.

JAMES STIMSON, M.D.

Plum Creek, U. P. R. R., Dawson county, Neb.,
May 11, 1882.

Boiler Notes.

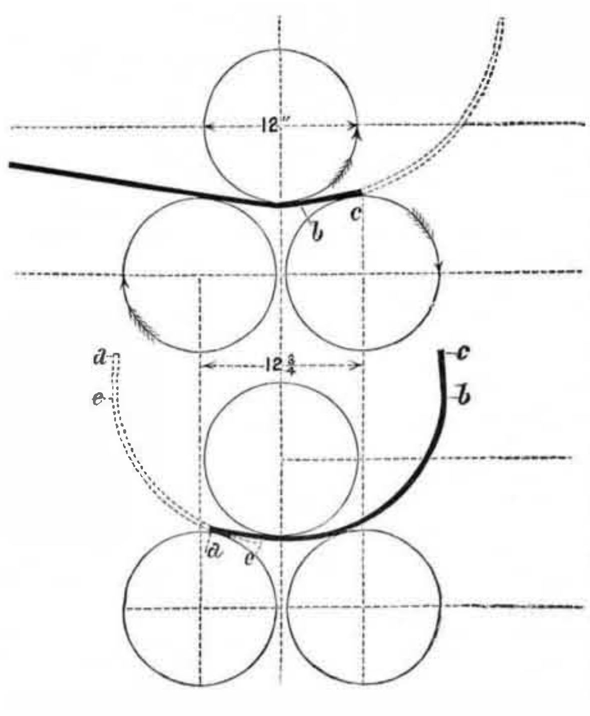
To the Editor of the Scientific American:

I was much interested in your remarks on boiler notes and sketches, showing a probable cause of defective sheets in steam boilers; also the article headed "Steam Boiler Explosions," from Mr. Parker. We are sorry that Mr. Parker, while explaining, by sketch and otherwise, the cause of the flat places left at the end of the sheet, did not, with his long experience, go a little deeper into the matter and point out to his fellow craftsmen how to obviate the trouble which is a great trouble to all boiler makers. Mr. Parker failed to state in his description that it is the end of the sheet coming through the rolls last which leaves the flat place referred to. We remedy this by slacking up our bottom roll and passing the sheet at the laps through the rolls. Another way would be to start one end of sheet through the rolls, then take it out and turn it and run it through from the other end, thus avoiding the flat place at end of sheet. But in practice, with heavy sheet, very few boiler makers care to do this.

I am a boiler maker, and I often see articles pointing out a very plausible cause, but failing to give any remedy.

If practical mechanics themselves would contribute a little of their practical experience and knowledge in place of being satisfied to simply read the ideas of others, it would bring to light a great many valuable ideas, which if expressed in a crude way might still be very valuable.

I. BARTON.



REMARKS.

With a view of testing the theory of our correspondent, experiments in bending a quarter inch boiler plate of ordinary quality were made by a representative of the SCIENTIFIC AMERICAN at one of the best equipped boiler shops in the country. The result, as shown in the accompanying sketch, was what we expected, namely, flat portions at each end of the plate from *c* to *b* at the entering end, and from *a* to *e* at the end coming out of the rolls. These experiments showed that results varied (*a*) with the thickness and stiffness of the plate, (*b*) with the radius of the arc made in the first passage of the plate through the rolls, and (*c*) with the size and adjustment of the rolls.

When space is available for a fuller discussion of this subject an adequate remedy will be suggested.

Motive Power from Steam Heating Pipes.

To the Editor of the Scientific American:

I desire to call attention to my plan for producing power at a small expense for fuel, in connection with my system of furnishing heat and power in cities from central stations. I have a steam supply plant in operation in St. Paul, Minn., where heat and power are furnished to a large number of buildings, the power, during the season in which the demand for heat is in excess of that for power, being produced at a very small expense by the following described plan:

In the boiler house of the central station two sets of boilers are located, one set to be run under a pressure of, say, 80 pounds; the other set to be run under, say, 150 pounds pressure. The steam produced in the boilers under 80 pounds pressure passes directly from the boilers to the street supply mains. In connection with the boilers running under 150 pounds pressure engines are operated, the exhaust steam from them passing into the street supply mains, mixing and passing on with the steam produced by the boilers running under the lower pressure. By this plan the power produced by the engines costs only the *actual units of heat* required to develop the power obtained; the exhaust steam, as it leaves the engines, carries with it all the heat it contained when first generated, less the small percentage utilized by passing through the engines.

The following estimate of the cost of power under the conditions named below are based upon data taken from W. P. Trowbridge's "Tables and Diagrams Relating to Non-condensing Engines and Boilers," H. Northcott's "The Steam Engine," and other works of similar import, with facts obtained by practical tests that have come under the observation of the writer.

Taking as a basis a 100 horse power engine, 17 x 42, cutting off at one-quarter stroke, running 60 pounds of steam, making 81 revolutions per minute, the exhaust steam going to waste.

Pounds of coal per indicated horse power per hour, 3·464; pounds of feed water per indicated horse power per hour, 31·800; cost of coal at $4.00 per ton for one year, running 10 hours per day, for 100 horse power, $2,806.00; units of heat expended per 100 horse power from 32° above zero to temperature due to 60 pounds pressure of steam, 3,729,680,000; units of heat actually transferred into indicated horse power under above conditions, 256,477,000; percentage of heat utilized, 6·89.

In the following table the same amount of power is to be developed, but the engine is to run under such back pressure that all of the exhaust steam can be used for heating purposes. The kind of engine used and the actual quantity of steam is immaterial, the only conditions necessary to make the plan profitable being that the total quantity of steam required for heating purposes shall be in excess of that required to pass through the engines in order to give the power needed: Pounds of coal per indicated horse power per hour, 0·2389; cost of coal at $4.00 per ton for one year, running 10 hours per day, for 100 horse power, $193.33.

There is a slight additional loss in radiation and leakage, caused by carrying a higher pressure, but this loss is much more than made up by purer water to feed the boilers with and the reduction in cost of repairs.

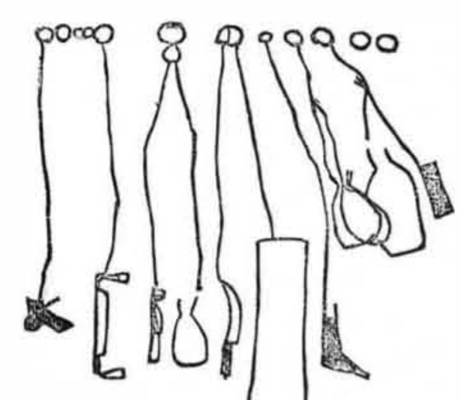
By the method described above power for any purpose may be produced, in connection with my system of furnishing heat and power on a large scale, at a small expenditure of fuel, but it is especially valuable as offering a practicable solution of the problem of cheap power for producing the electric light in cases where the business of furnishing heat, power, and light can be combined or operated in connection with each other.

E. F. OSBORNE.

Fire Wolf's Book Account.

In a letter to the New York *Herald* from Fort Keogh, Montana Territory, describing a Cheyenne settlement near that point, General James S. Brisbin says that the Indians are becoming skillful market gardeners, and give many evidences of industrial energy and thrift. Their trade is already considerable and much sought after by the village shop-keepers. Their credit is as good as gold, and anybody will trust them, for they never fail to pay. They do their principal trading at the post, and it pays the trader to keep an interpreter clerk. They have regular book accounts, and the sutler says he would rather trust them than many white men. They never fail to keep their obligations and always pay just when they say they will. They keep accounts of their own and know just what they owe.

General Brisbin was in the fort trader's store one day when an Indian named Fire Wolf was settling his account. He had a little book in which his accounts were kept in the following style:



The explanation of this remarkable attempt at Indian bookkeeping is as follows: First, he bought a pair of shoes, for which he paid $2.50, which is represented by the two upper large dots for dollars, the small dot half a dollar, the drawing of a shoe and the line connecting it with the dots. Then he bought a drawing knife, for which he paid $1.50—the big dot and a little one. Then he bought a monkey wrench and a paper of sugar for $1.50. Next he bought a knife and a piece of calico, for which he paid half a dollar each. The drawing lines and split dot represent this transaction. Then he bought a pair of stockings for half a dollar; next a small paper of coffee and a larger paper of sugar, half a dollar each; then a big paper of crackers and a plug of tobacco. He had paid for all these articles, except $2, which he owed, and he had come to settle his account. The debt is represented by the last two dots. His account agreed exactly with the book account in the store. After he had paid his account the store keeper tore out the leaf and gave it to General Brisbin.

A Remarkable Block of Amber.

Some fishermen of the Isle of Zuigst have fished up, opposite Stralsund, a piece of amber weighing more than eight pounds. It is 9½ inches long and 5½ inches in circumference. It is a most remarkable piece of amber, having all the qualities which distinguish the rarest pieces, color dark yellow, shining like glass, and not transparent. It is rare that a piece of amber weighs a pound. The piece, which is preserved in the Museum of Natural History at Berlin, weighs about 14 pounds.