NEW KEY FASTENER.

The engraving shows a novel lock escutcheon, by which the key may be held and securely fastened in the lock, and by which the keyhole may be closed when the key is not in the lock. A device is provided for preventing the escutcheon from being operated from the opposite or under side by a knife or sharp pointed instrument.

The escutcheon consists of two plates of circular form, one plate being fastened by screws to the door, and having in it a keyhole and a curved slot, shown by the broken lines. The second or outer plate is pivoted to the inner plate, and has a keyhole with a straight slot opening out of it. A stud passes through a slot in the inner plate and limits the motion of the outer plate, and a knob is provided by which the plate may be moved, so that the keyholes in the two plates will correspond. The key is inserted and turned, throwing the bolt until the flat part of the handle of the key stands in the proper position to be received by the slot in the outer plate, when this plate is moved back to correspond with the under plate, with the key inclosed in and held from turning by the slot.

When the two plates coincide, holding the key in the slot, it would be possible to enter a knife or pointed instrument through the opposite keyhole, and by pressing the point into the under surface of the movable plate to move it back, causing the keyholes to correspond, when the key may be turned or pushed out. In order to prevent this, notches are formed at the inner end and on the sides of the curved slot in the fixed plate, and two wings are formed on the opposite sides of the stud or pin projecting from the movable plate, so they coincide with notches in the fixed plate when the key is locked in; and any pressure against the under side of the plate will push the plate so that the wing on the end of the stud will enter the notches, effectually preventing the plate from being moved in the manner described. This device answers the purpose of an extra lock or bolt, and is very easily applied to a door, and cannot get out of order. It effectually prevents the key from being turned with forceps or pushed out from the opposite side. It makes the cheapest lock perfectly safe, and it presents a neat appearance on the door. It can be used with either flat or round keys.

This invention has been patented by Mr. Edward K. Tolman, of 59 Pleasant Street, Worcester, Mass., who may be addressed for further information.

Vegetable Substitute for Rennet.

BY SIR J. D. HOOKER.

Mr. Stormont, Superintendent of the Government Farm, Khandesh, reported May 10, 1880: "Cheese making is a branch of agricultural industry altogether unknown in this district, and but imperfectly understood in any part of India; yet there seems no reason why it should not be successfully practiced."

Commissioner E. P. Robertson minuted upon this, June 10, "Cheese to be salable among the natives of this country should be made with some vegetable rennet. Natives would not touch cheese made with ordinary rennet, and I am convinced that good cheese cannot he without the use of some rennet. If a good vegetable rennet could be procured, the curd cheeses could be made; they would be cheap, and ryots would soon find a ready sale for them."

These facts having attracted my attention, I consulted Mr. A. H. Church, formerly Professor of Chemistry in the Royal Agricultural College, Cirencester, but who has taken up his residence at Kew, and is now Professor of Chemistry to the Royal Academy. This gentleman very kindly made some experiments on curdling milk, with calcium chloride and with vegetable acids. He arrived at the conclusion, however, that though in the laboratory good results could be obtained, they depended too closely on careful attention to the conditions of the process to afford a workable method for everyday use in India. Meanwhile, I had turned my attention to some suitable vegetable "rennet." Surgeon-Major Aitchison, while engaged at Kew, in working up his Afghan collections, under instructions from the Government of India, suggested a well known northwest Indian plant (*Puneeria coagulans*) as possessing the desired qualities.

The plant in question is one of the best known plants in Scinde, Beloochistan, and Afghanistan. "It bears the name of Puneer-bund (cheese maker), from its being used by the Beloochees and Afghans in making cheese (puneer), as a substitute for rennet."

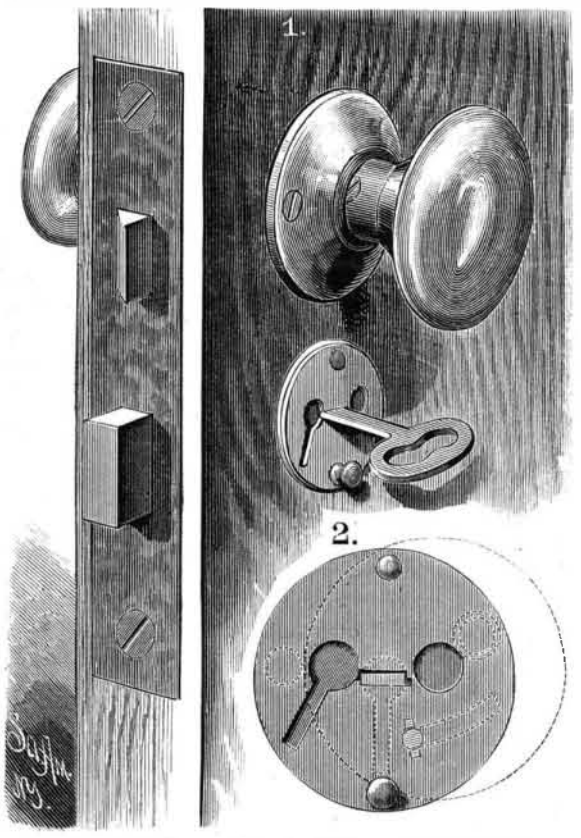
I communicated this information to the India Office. As will be seen from the following extract from Mr. Stormont's report for 1881, the suggestion was immediately acted upon with very gratifying success:

"During the year a good deal of attention has been devoted to dairy experiments, especially the making of cheese after the practice of Italy and Switzerland. The Commissioner, C. D., pointed out that, before cheese making can ever become an industry of the ryots, some vegetable substance must necessarily be found to take the place of the animal rennet used in European countries.

"In connection with this difficulty, Surgeon-Major Aitchison brought to the notice of the authorities at Kew that the fruit of *Puneeria coagulans*, a shrub common in Afghanistan and Northern India, possesses the property of coagulating milk.

"A quantity of the dried capsules of this plant was accordingly obtained, and part of it tried here, and found to be most suitable for the purpose. Being a member of the poisonous nightshade family, its safety was in the first place carefully and gradually tested. It has been ascertained that an ounce of the pounded capsules in a quart of water is a very suitable strength for use; a tablespoonful of this decoction coagulates a gallon of warm milk in about half an hour. Seeds of the plant sown have germinated freely, and their further progress will be specially reported upon."

The anxiety as to the botanical position of *Puneeria* among the *Solanaceæ* has, I think, no solid foundation. The genus *Puneeria* is now reduced by botanists to *Withania*. This is a member of the tribe *Solaneæ*, which appears to be generally free from the poisonous principles so characteristic of *Atropeæ* and *Hyoscyameæ*. It abounds, in fact, in plants producing fruits which daily experience shows to be innocuous, such as the tomato, aubergine, capsicum, *Cyphomandra*, and cape gooseberry.—*Kew Report.*

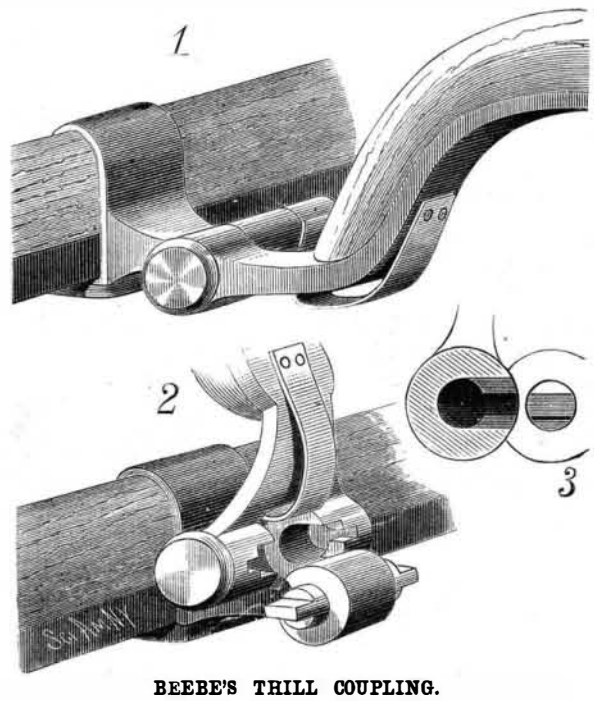


NEW KEY FASTENER.

IMPROVED THILL COUPLING.

The engraving represents an improved coupling for the thills of carriages and wagons, recently patented by Mr. G. W. Beebe, of Swanton, Vt. This device is simpler than the ordinary coupling, while it is perfectly secure against accidental uncoupling. It consists of two parts, one attached to the thill, the other to the axle.

Fig. 1 shows the coupling in condition for use; Fig. 2 shows it with the two parts separated; Fig. 3 is a sectional view, showing the end of the pin and the recess in the fork attached to the thill. The part of the coupling carried by the axle consists of a clip secured to the axle in the usual way, and having on the front side an arm supporting a short



BEEBE'S THILL COUPLING.

cylinder having at each end a cylindrical stud with a flattened end. Each branch of the fork attached to the end of the thill has a cylindrical cavity opening inward and provided with a side opening, which will admit the stud at the end of the short cylinder carried by the clip, when the thill is in a vertical position. When the thill is turned down into a horizontal position for use, the flat portion of the stud will be arranged transversely relative to the narrower portion of the side opening in the end of the fork.

It will be seen that with this arrangement it is impossible to remove the thill except by bringing it into a vertical position and moving it backward, as shown in Fig. 2. A spring riveted to the fork prevents rattling by pressing against the cylinder carried by the axle clip.

Further information in regard to this useful invention may be obtained by addressing the inventor as above.

The Yankee in the South.

The impression still obtains that the Southern people cherish such a deadly hatred to Yankees that they will neither smell, taste, touch, nor handle anything contaminated by Yankee hands. This is a most egregious error. The Southern people love the Yankee, and they show this affection in a thousand different ways. When they retire at night, they unbutton Yankee buttons to Yankee made coats, waistcoats, pantaloons, shirts, and drawers. They pull off Yankee boots with Yankee boot jacks and divest their feet of Yankee socks. They march to Yankee bedsteads, turn down Yankee coverlets, Yankee blankets, prostrate themselves on Yankee mattresses, and lay their heads upon Yankee pillows. The bedbugs are the only things not made by Yankee hands and imported from the land of the Yankees. On rising in the morning we tread Yankee carpets, stumble over Yankee chairs and sofas, build a fire with Yankee coal taken from Yankee scuttles, in Yankee grates, catch the ashes in Yankee pans, and use Yankee pokers, Yankee shovels, and tongs. We repair to Yankee washstands, pour water from Yankee pitchers into Yankee bowls, and wash with Yankee soap; then use Yankee towels and Yankee tooth brushes. Next we march to a Yankee bureau, stand before a Yankee glass, and use Yankee combs, Yankee brushes, Yankee powder, Yankee cologne in Yankee bottles. We sit down in a Yankee chair to a Yankee table, covered with Yankee cloth, Yankee knives and forks, Yankee dishes, and fed upon Yankee food. We call for Yankee toothpicks, seize Yankee hats from Yankee racks, turn the key to a Yankee lock, open a Yankee door, enter a Yankee buggy, seize the Yankee reins to a Yankee harness, and repair to our place of business, and spend the day in trading on Yankee industry. The South is rich in resources, but our people are so fond of the Yankees that they lavish their wealth upon Yankee enterprise.—*Memphis Appeal.*

Cure for "Spinning."

M. Poisot lately communicated to the *Société de l'Industrie Minérale de Saint Etienne* some useful information as to the means for preventing the "spinning" of locomotive wheels in the Mazenay mines, no more fuel being now employed for hauling out 100 tons than for 80 formerly. He observes that the ventilation is effected by diffusion, and there is constantly in the rolley way a tolerably thick smoke, which with condensed steam from the engine and the dampness of the workings causes the rails to be slippery. The consequence is that every time they tried to ascend the gradient of 1 in 66 with a full train, they could only get up half of it, about 180 meters (590 feet) without the wheels beginning to spin; and during the rest of the rise, notwithstanding the use of fine and dry sand, this difficulty frequently began again, so that they lost pressure to such an extent that they were obliged to stop to make steam. This difficulty caused great consumption of fuel, excessive wear of the working parts of the engine, and a rapid destruction of the rails. About two months ago the joint of one of the cylinder cocks leaked, and a jet of steam escaping from it was directed on to the rail, when the train took the gradient without the engine once spinning. For two days they worked without making the repair, and the locomotive drew all the trains without the slightest stoppage. In consequence of this experience they altered the cylinder cocks so as to make them discharge directly on to the rails, and when they get to the gradient the cocks are slightly opened, so that they ascend it without difficulty.

The Inventor of the Incandescent Electric Light.

Prof. W. Mattieu Williams, writing to *Nature*, says: In the "Notes" of *Nature*, vol. xxvii., p. 209, M. De Chagny is described as "the first electrician who attempted to manufacture incandescent lamps *in vacuo*, about twenty years ago." This invention and its successful practical application (irrespective of cost) was made by a young American, Mr. Starr, and patented by King in 1845. A short stick of gas-retort carbon was used, and the vacuum obtained by connecting one end of this with a wire sealed through the top of a barometer tube blown out at the upper part, and the other end with a wire dipping into the mercury. The tube was about thirty-six inches long, and thus the enlarged upper portion became a Torricellian vacuum when the tube was filled and inverted. I had a share of one eighth in the venture, assisted in making the apparatus and some of the experiments, and after the death of Mr. Starr all the apparatus were assigned to me. I showed this light (in the original lamp) publicly many times at the Midland Institute, Birmingham, and on two occasions in the Town Hall, all of them more than twenty years ago. The light was far more brilliant, and the carbon-stick more durable, than the flimsy threads of the incandescent lamps now in use. It was abandoned solely on account of the cost of supplying the power. As a steady, reliable, and beautiful light, its success was complete. In "A Contribution to the History of Electric Lighting," published in the *Journal of Science*, November 5, 1879, and reprinted lately in my "Science in Short Chapters," may be found further particulars concerning this invention and its inventor.

How to Help a Man Who Swears Off.

A large audience assembled at Franklin Institute Hall, Philadelphia, recently to hear the last lecture of the New Century Course for Women. Suggestions contributed by Dr. Joseph Parrish, of New Jersey, Dr. R. P. Harris, of the Franklin Home, Dr. Jos. Klapp, of the Washingtonian Home, Dr. T. D. Crothers, of the Hospital for Inebriates in Hartford, Conn., Dr. Chas. Mohr, Secretary of the Pennsylvania Homœopathic State Society, and many others, were read.

Mr. C. Gibbons, Superintendent of the Franklin Home, made an earnest appeal to women for patience with the men whose weakness has tried them so sorely, and who suffer so deeply themselves in their efforts to reform. Very interesting addresses followed from Mr. S. P. Godwin, founder of the home, and the Rev. Chas. G. Ames. All agreed that the safest of all ways to stop drinking is to stop short off from all stimulation whatever, hot drinks, cold drinks, bitters, and all the list.

The Philadelphia *Ledger* sets down some of the advice given for the benefit of those to whom such a break would be an impossibility. For such let the house mother always have on hand something hot, or tonic, or refreshing, to tide over for the hour the agonizing demand of the body for stimulation. Hot drinks—coffee, sometimes tea, cocoa, either ground or in the form of shells or cracked cocoa. This is nutritious as well as satisfying. Hot broth, beef tea, or beef essence can be bought, but are far better made at home; hot milk, ginger tea, cayenne pepper tea, and an article called tabasco, which is hotter than ordinary cayenne. Aerated drinks—lemon soda, zoedone, and ginger ale can be kept in the house, and are harmless, the tang being given by fixed air; the home-made beers, on the contrary, are treacherous, the life depending directly on fermentation. Refreshing drinks are cold milk, buttermilk, whey, drinks from lemon and other acid fruits, Horsford's acid phospliate, and what is just as effectual and much cheaper, dilute phosphoric acid. A few drops in water, sweetened, makes a pleasant drink, and ten cents' worth will last for months. Oatmeal water, just a handful in a pitcher of water. This is both refreshing and strengthening, especially in summer.

In the Baldwin locomotive shops, where about 5,000 men are employed, this is kept on hand in large quantities, and, strange to say, even drinking men grow fond of it. They say that when they drink it they don't seem to want their beer. Juicy fruits—apples, oranges, melons, etc. The surest way to bring up children not to care for alcohol is to accustom them early to liking all sorts of fruit. The lecturer spoke in the strongest terms of the misery caused by physicians by the reckless prescribing of alcoholic stimulants to patients, without a word of inquiry as to the habits or the inherited tendencies of the individual.

A New Test for Living Germs in Water.

Many analysts, says the *Brewer's Guardian*, are in the habit of testing the organic purity of a water by dissolving a little sugar in it; if the germs of any living organisms are present, the water will, after being kept in a warm place for about twenty-four hours, become cloudy, and sometimes quite milky or opaque, owing to the rapid development of fungoid organisms, resulting from the growth of the germs in a suitable nutritive medium. The test is a valuable one, but requires to be used with caution. It is well to remark, however, that some chemists believe that the growth of the fungoid organisms is dependent upon the presence of phosphates rather than upon any organic impurities, and that it is possible the germs may be derived from the air, and not from the water itself. Those who have experimented on the subject cannot have failed to observe how very varied is the behavior of different waters when treated with sugar.

Recently Dr. Smith, of Manchester, has pointed out that gelatine is most valuable in detecting organic vitality in waters. About 2½ per cent of gelatine well heated in a little water is mixed with the water to be tested, and the mixture forms a transparent mass, which is not movable like the water itself. When soluble or unobserved matter develops from the organic matter of the waters, and makes itself visible in a solid and insoluble form, it does not fall to the bottom, but each active point shows around it the sphere of its activity, and that sphere is observed and remains long. The gelatine preserves the whole action, so far as the more striking results are concerned, and keeps a record for a time, both of the quality and intensity of life in the liquid. Dr. Smith speaks of the more striking effects, which are clear and abundant, every little center of life making itself apparent to the eye, and sometimes expanding its influence to reach both sides of the tube.

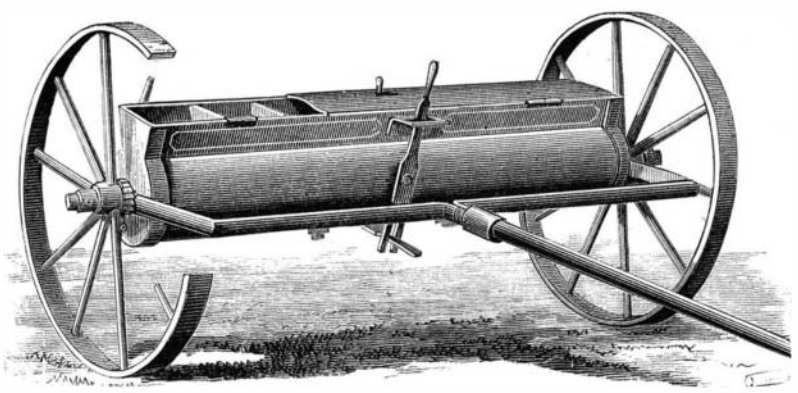
It seems to him now essential that all chemical examination of water should be supplemented by an inquiry into the comparative activity of the living organisms.

A New Moxa.

Under the name of *crayon-feu*, Dr. Moses describes a preparation made as follows: Charcoal powder, 30 grammes; potassium nitrate, 4 grammes; powdered iron, 5 grammes; benzoin, 1 gramme; the whole to be made up with some active substance into forty crayons. He so obtains a hard preparation, which is easily inflamed by a match, and which he proposes for the cauterization of poisoned wounds and when the actual cautery is required.—*Medical News; Gaz. Hebdomadaire.*

IMPROVED SEED SOWER.

This is a machine for sowing tobacco seed, cabbage seed, turnip seed, and other small seeds, accurately and expeditiously. The shell of the seed box is cylindrical, with a vertical upper part provided with a cover. The hubs of the drive wheels are connected with the axle by set screws, so that they may be readily detached when required. The axle passes through and revolves in bearings in the ends of the cylindrical part of the shell.



IMPROVED SEED SOWER.

To the axle within the shell are attached a number of disks, to the edges of which are attached rods extending throughout the length of the seed box. These disks and rods form a stirring reel to agitate the seeds, so that they will readily pass out through the discharge apertures in the bottom of the seed box. The disks also serve as partitions to separate the seed box into compartments, to prevent all the seed from settling toward one end of the seed box should the seed box be inclined toward either end by one of the wheels passing over a clod or other obstruction.

In the bottom of the seed box are formed two or more rows of discharge apertures of unequal size, so that either row of apertures can be used, as the size of the seeds to be sown may require.

A curved plate fits upon the outer surface of the cylindrical bottom of the seed box, and is held against the bottom of the said seed box by bands passing around the lower part of the shell, and secured at their ends to the front and rear sides of the shell. With this construction the valve plate can be adjusted by sliding the plate laterally between the shell and bands.

A plate which projects downward and is curved to the rearward, is attached to the seed box and serves as a guard to prevent the discharge openings from becoming clogged by the contact of soil with the bottom of the seed box.

The principal advantages possessed by this machine are simplicity, lightness, durability, and cheapness. It is adapted to all kinds of seeds, is reliable, working equally well on rough and smooth land, and is capable of being used when drills are unavailable. We understand it has been approved by our best farmers.

This invention has been patented by Mr. John F. Heady, of Ghent, Ky.

IMPROVED SEED SOWER.

THE facetious Mark Twain says there is something very fascinating about science—it gives you such wholesale returns of conjecture for such trifling investments of fact.

Floral Decorations.

Ornamental grasses impart to an arrangement a lightness and distinctive character which fern fronds, handsome as they are, fail to give. Moreover, it is difficult to keep up the needful amount of cut ferns without disfiguring the plants; therefore, we should grow ornamental grasses for the purpose, thus sparing many fern fronds. Most of the useful sorts are easily grown from seeds. We sow them in March in the open border in well prepared soil—the earlier in the month the better, if the weather is favorable. We have found the following six kinds to be among the most useful, viz., Agrostis nebulosa, and pulchella.

These come into flower early, and are about the very lightest that can be grown; they are also often sown in pots, and in this manner are useful for furnishing purposes. Briza maxima and gracilis are two of the best of the quaking grasses. We find the former to be especially valuable, and to arrange well with water lilies and similar subjects. This sort is also one of the best for cutting and drying for later use; if cut while the deep green tint is in it, it retains its color better than if left till it has assumed a brownish tinge.

Lagurus ovatus (the Turk's head grass) is one of the most distinct kinds, as well as one of the best for keeping purposes if treated as just advised in the case of the Briza. For bold arrangements in association with large flowers this is an excellent kind. Another valuable grass is Eragrostis elegans; this is a later kind than those previously named, and comes in useful for cut purposes up to the time when the early frosts spoil its color. It is a somewhat stronger sort than the others; when well grown it attains a height of from 2 feet to 2½ feet high. It should therefore be allowed more room than the others in which to develop itself. The following sorts are all useful and distinct, viz , Anthoxanthum gracile, Brizopyrum siculum, Bromus brizæformis and giganteus, Hordeum jubatum, and Paspalum elegans.

Two new kinds have recently been brought forward, viz., Briza spicata and Bromus patulus nanus, both of which will doubtless prove useful. These grasses, taken collectively, are about the best that can be annually raised from seed Stipa pennata and elegantissima may be increased by division, perhaps, with more certain results than from seeds. These ornamental grasses are all valuable in their seasons, and for preserving for use afterward, not, however, after they have been disfigured by drying. When those raised from seed are well above the soil, it will be well to thin out any kind that has come up too thickly. This will throw more stamina into those that are left, rendering them more durable.

The following annuals are all useful associated with grasses, viz., Campanula loreyi and its white variety. Catananche cœrulea, sweet sultan (yellow), Rhodanthes, Linum grandiflorum coccineum, the Corn Flowers in various colors, dwarf poppies, single dahlias, which have a future before them, and last, but not least, Gypsophila elegans and its variety rosea. Many more annuals might be named, but these are among the best for decorative arrangements and for using in conjunction with grasses. One of the hardy perennials that may be raised from seed is Chelone barbata coccinea; this when in flower yields good spikes for trumpet vases.—*The Garden.*

The Great Wall of China.

An American engineer who, being engaged in the construction of a railway in China, has had unusually favorable opportunities of examining the famous Great Wall, built to obstruct the incursions of the Tartars, gives the following account of this wonderful work: The wall is 1,728 miles long, 18 feet wide, and 15 feet thick at the top. The foundation throughout is of solid granite, the remainder of compact masonry. At intervals of between two hundred and three hundred yards towers rise up twenty-five to forty feet high, and twenty-four feet in diameter. On the top of the wall, and on both sides of it, are masonry parapets, to enable the defenders to pass unseen from one tower to another. The wall itself is carried from point to point in a perfectly straight line, across valleys and plains and over hills, without the slightest regard to the configuration of the ground; sometimes plunging down into abysses a thousand feet deep. Brooks and rivers are bridged over by the wall, while on both banks of larger streams strong flanking towers are placed.

The Unused Water Power of North Carolina.

Recently, in Congress, Senator Vance, of North Carolina read from a report of the late Professor Kerr, geologist of that State, an estimate of the unused water power of the North Carolina rivers. The main streams have an aggregate length of 3,300 miles, with an average fall of ten feet to the mile, giving a horse power of 3,300,000. The numerous tributaries are not included in this estimate. The wasted water power of the State rivals the estimated engine power—stationary and locomotive—of Great Britain.