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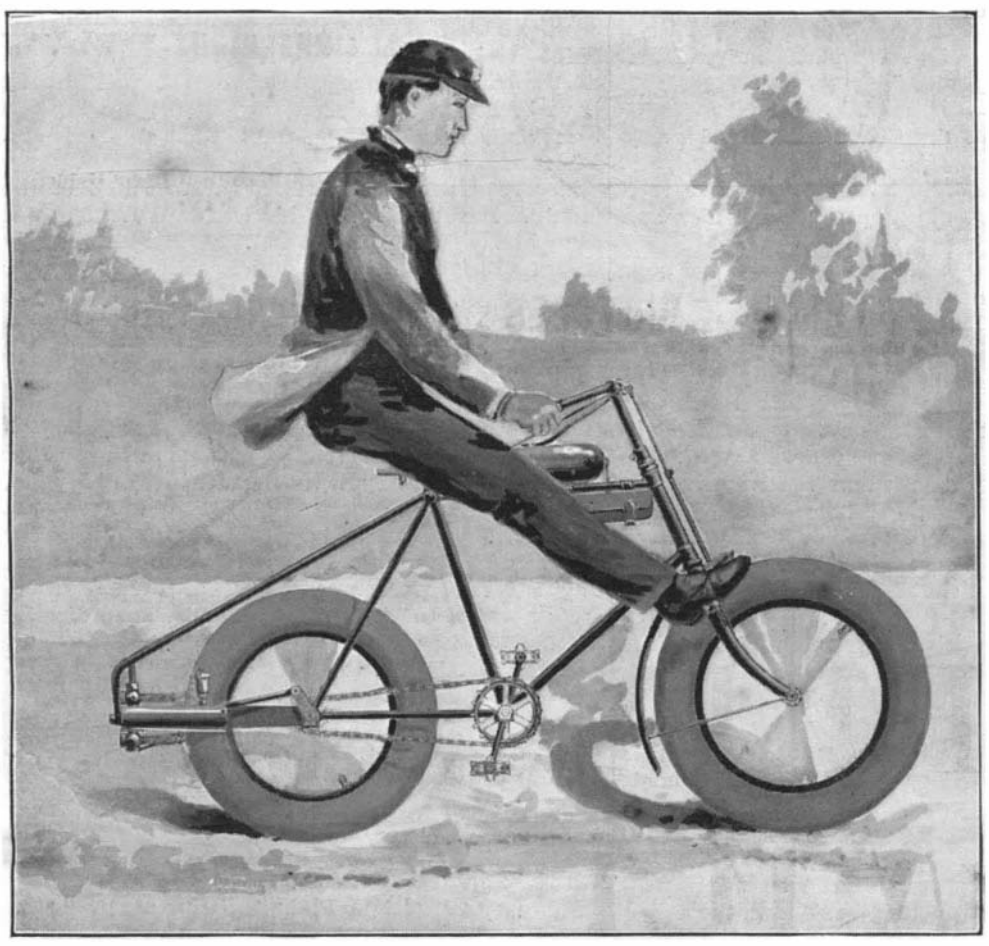
THE NATIONAL BICYCLE EXHIBITION IN MADISON SQUARE GARDEN, NEW YORK.

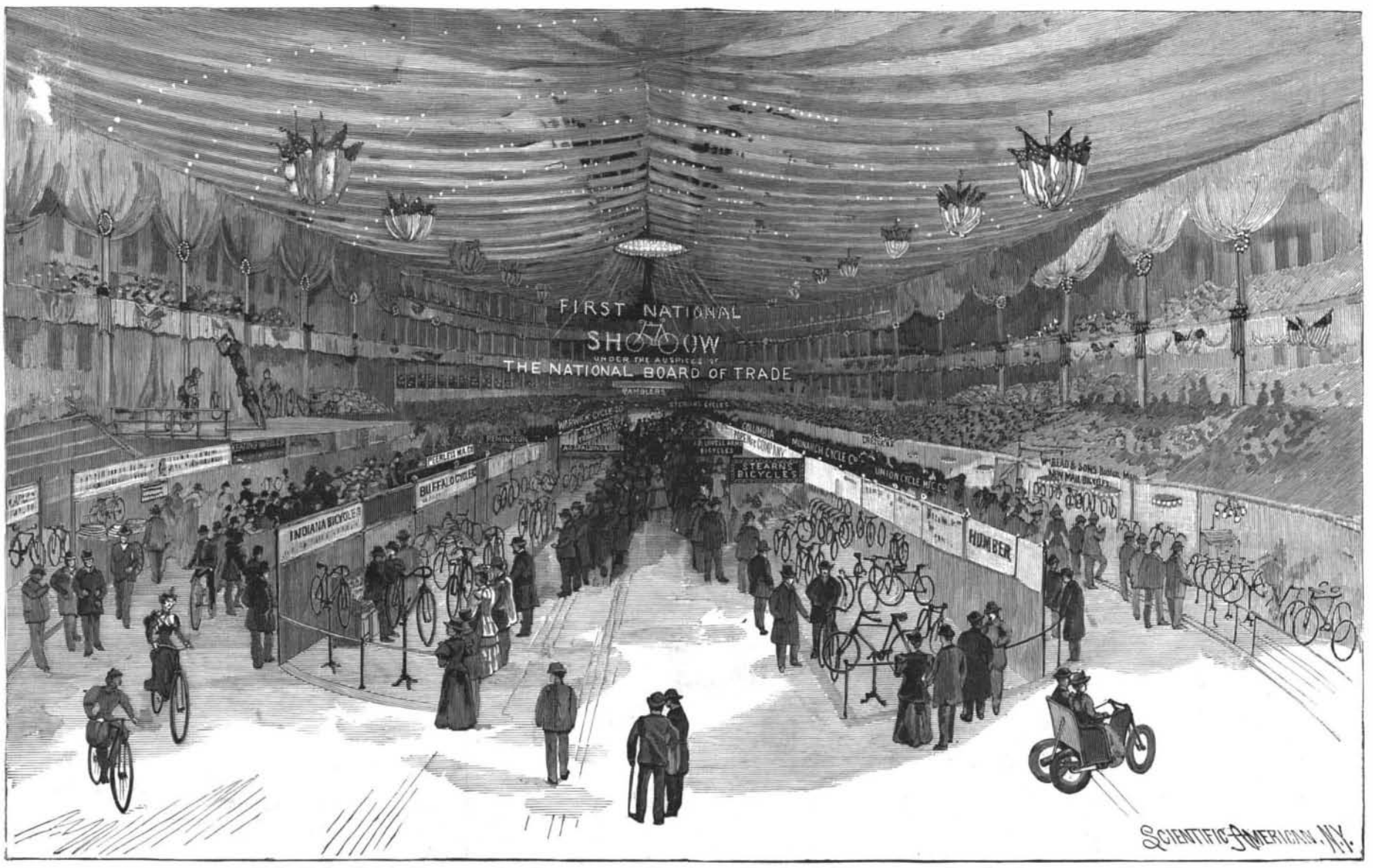
The National Bicycle Exhibition, which for a week was in possession of Madison Square Garden, in this city, in the interest it excited, as shown by the crowds attending it, compared favorably with any exhibition hitherto given there. The best time to see the exhibits was early in the day. As the afternoon progressed, the hall rapidly filled, and in the evenings it was crowded. On entering at the west entrance, if in the evening, the electric bicycle, nearly four hundred

(Continued on page 86.)



THE MOTOR CYCLE.

THE EIGHT POUND FOURTEEN OUNCE TRIBUNE BICYCLE.



THE NATIONAL BICYCLE EXHIBITION IN MADISON SQUARE GARDEN, NEW YORK—GENERAL VIEW.

THE NATIONAL BICYCLE EXHIBITION IN MADISON SQUARE GARDEN, NEW YORK.

(Continued from first page.)

feet away and high up on the eastern wall, was seen with its wheels and gear in motion. This ingeniously arranged apparatus was a model of a bicycle thickly studded with electric lamps. It was about 20 feet long and 13 feet high with 8-foot wheels. Some 2,200 lamps were used on the model and on the accompanying signs, as shown in the general view.

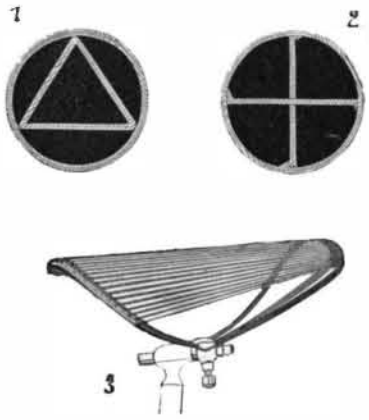
All around the edge of the floor area were spaces filled with exhibits, and four rows of spaces extended up and down the center. The full census showed 163 exhibitors, some of whom were necessarily crowded off the main floor to spaces up among the boxes. The great hall was barely large enough for its contents.

On the center of the north side was a large stage where trick riding and other performances were given, while from another stand an excellent band provided music.

Our large view gives a good idea of the general aspect of the hall when trick riding was in progress on the stage and some of the bicycles were being shown in operation. The exhibits as a rule were mounted on high standards so that they could be examined in all points without stooping. No minor feature of the exhibition was more worthy of commendation than this uniform system of display.

We give illustrations of a few of the more noteworthy things shown. But so much was there, and so many novelties in construction of pedals, cranks, hubs, handle bars and other details were exhibited, that our space is insufficient for more than a suggestion of it all.

In the foreground of our large view is seen the motor cycle in its four-wheel form, while elsewhere we show the single two-wheeler. A tandem two-wheeler with child's seat in front was shown in operation daly. The two-wheeler is driven by a two-cylinder explosion naphtha engine, rated at two horse power. The engine and all appliances weigh 12 pounds. The



FRAME RE-ENFORCEMENTS—THE CLIMAX WIRE SADDLE.

naphtha tank is on the upper brace of the frame. The mixed air and vapor are ignited by an electric spark, the battery for producing which is carried in the tool bag hanging beneath the naphtha reservoir. The front wheels are 22 inches, the rear wheels 20 inches in diameter, and very large tires have been adopted to prevent the wheels from sinking into soft roads. The power is increased or reduced by the rider at will, and a very high speed can be attained. These machines are made by the Hitchcock Manufacturing Company, Cortland, N. Y.

The curiosities of the show included several light wheels, and we illustrate a real wonder in this line, an 8 pound 14 ounce Tribune bicycle, shown by the Black Manufacturing Company, of Erie, Pa. It is full size throughout, having 28 inch wheels and a 43½ inch wheel base. It is only on taking it in the hand that its lightness can be realized. It has 13 ounce M. & W. tires; the tubing is No. 26 gauge (0·016 inch thick) and steel forgings are used for all frame joints. The full number of spokes are used for the wheels, 28 for front and 32 for rear wheel. It has been thoroughly tested by an average weight rider and is doubtless the lightest full sized wheel ever made, being a veritable tour de force. Regular racing wheels are made as light as 15 pounds in weight.

In another cut we show some methods of re-enforcing tube ends. It is at the joints in the frame that tubes give away generally. The Eagle Company insert an extra piece of tube within the other, and cold swage the end so as to reduce the diameter there one-eighth of an inch. The swaging consolidates the outer tube and re-enforcement so that the two are practically one. One figure in the cuts shows the Hoffman re-enforcement with an inner triangular tube, while the Union re-enforcement with interior plates crossing each other at right angles is also shown.

The wire saddle shown in the same cut is one of the greatest novelties in the saddle line which was at the exhibition. A wire frame of the contour of a saddle has spiral springs stretched lengthwise in place of leather, making a very light and elegant saddle, and one which has been used with much success. It was shown on many of the high grade machines, and added to their attractive appearance. It is made by the Climax Manufacturing Company, of East Hampton, Conn.

The exhibit of the Stearns Company, of Syracuse, N. Y., deserves special notice. They claim for their road wheel the narrowest tread, 4 inches, and lightest weight of a large number of other high grade wheels. The narrow tread is the feature of advanced wheels of this year, the great effort being to bring the feet as close as possible, so as to get a direct thrust upon the pedals. This will have its effect in avoiding the knock-kneed appearance often presented by good riders.

A Hurricane at Tillamook Light.

The Seattle Post-Intelligencer gives the following concerning the great hurricane that swept over the sea in the vicinity of Astoria, Oregon, December 9 last.

The lighthouse tender Columbine returned at 6 o'clock this evening from Tillamook Rock, having left for that place this morning to investigate the reported damage to the light from Sunday's hurricane. The sea was too rough to get within speaking distance of the rock, and it was found impossible to land any one by means of the derrick and basket. The Columbine went around the rock several times, and could easily see that considerable damage had been done. The sharp top of the smaller rock, at the south of the main rock on which the lighthouse stands, is gone, and various other places show that huge bowlders have been torn off by the force of the storm. Chief Keeper Pessonen signaled that they were all well, and that he would send his report off in a bottle attached to a buoy. This he did, and it was soon picked up by the waiting steamer. An Associated Press reporter was shown the statement by Lieutenant Blish this evening upon the arrival of the Columbine, and from its contents is learned the full horror of the awful storm on the isolated rock and the dangers the men were subjected to.

Between 11 and 6 A. M. on Sunday last, the worst hurricane ever experienced on the coast raged around the lighthouse. Great mountains of water rolled in from the southwest, and, breaking against the base of the rock, would run up its steep sides and spend their force on the building, which trembled and rocked as if ready to tumble into the raging sea. By noon the storm was on in all its fury, and the seas rolled higher and higher. A great crash of glass shortly after noon told of the damage caused by the waves and fragments of rocks that had been torn loose from the main rock and hurled against the outer glass that protects the costly lenses. Examination showed that the panes were all broken, the lenses ruined and the clock machinery that revolves the light so badly damaged as to render it useless.

The force of the wind and waves can be judged when it is known that the lights broken are 136 feet above high water. A monster rock, weighing perhaps a ton, was hurled upward by the waves nearly 100 feet, and coming down crashed through the roof of the hall and kitchen. The range was ruined, and every movable article in the kitchen was washed away. At one time six feet of water was in the siren room, and four feet in the living rooms. These rooms are eighty-eight feet above high water. Nearly everything in the way of edibles, except the canned goods, were ruined. The cistern pump was rendered useless, and so much salt water entered the tanks that the fresh water was made brackish, though not unfit for use. The report states that the men are all well and have plenty of canned goods to last another week. Ordinary lanterns are hung in the tower, and will be used until the damage can be repaired.

The Advantages of City Cleanliness.

There is perhaps no other city upon our Atlantic and Gulf coast where the immediate effect of cleanliness in stopping yellow fever has been better illustrated than in New Orleans. Built upon a plane below the high water mark on the banks of the Mississippi River, the soil is necessarily saturated, and no attention having been given to sanitary measures, it soon became one of the filthiest and sickliest cities in the land. In consequence it has been visited by yellow fever 36 times in the last seventy-seven years, with a loss of life fully one-third of that sustained by the United States during the same period. Here quarantine was tried and given up in disgust, and again tried, all to no purpose. Every effort to save the city from the pestilence failed. During the early part of the civil war, and while in the hands of the enemy, it was cleaned as thoroughly as possible under military rule; and while other cities on the coast had the yellow fever, New Orleans escaped, notwithstanding the fact that cases originated in the river opposite the city on board ship. The disease did not reappear until 1867—the city having again been permitted to relapse into its former filthy condition, and the yellow fever to its former habits. Immediately after the terrible epidemic of 1878 a citizens' sanitary association was organized which furnished the money to remove the accumulated filth. The scavenger system was remodeled, steam pumps were used to empty the drains into the lake. Burials within the city were forbidden, and to this day the Southern metropolis has had no yellow fever epidemic, although sporadic cases have occurred on several occasions since.

Now, if New Orleans, in her unhealthy situation and with so many difficulties in the way to secure either subsoil drainage or an efficient system of house drainage, has been able to prevent yellow fever epidemics by the systematic removal of filth and surface water, there is certainly no valid reason why any city in the southern latitudes should be allowed to remain in the condition necessary to create or to propagate yellow fever.

If the money spent by the State governments and municipalities for quarantine purposes had been used for permanent sanitary works; if the general government had used the money spent for quarantine service and for epidemic purposes in the thorough drainage of sea ports, yellow fever as an epidemic would have disappeared long ago from Southern cities as it has done at the North and the world over, wherever a sufficient amount of money has been spent for sanitary work. If Congress, instead of giving quarantine officers power to squander money by the million, and trample upon the personal liberties of American citizens, would employ skilled engineers and sanitarians instead, and spend those millions in improving the sanitary condition of filthy ports, our commerce need never again be impeded by the detention of ships at quarantine. As soon as international laws are made and properly enforced which will secure cleanliness and free ventilation aboard ship, and that hospitals for the treatment of the sick and the detention of the infected will be provided, neither the plague, cholera, typhus, yellow fever, nor even small pox need ever be feared in this country.—J. C. Le Hardy, M.D.

The Tongues of Birds.

Every naturalist, says Nature, is acquainted with the elaborate spring-like mechanism by which the woodpeckers and humming birds are enabled to protrude their tongues with such rapidity for the capture of insect prey. These remarkable instances of adaptation have been more than once described, and some other special modifications of the avian tongue and its bony supports will be recalled by ornithologists. In a recent number of Der Zoologische Garten, Herr Schenkling-Prevot redescribes these cases after a renewed investigation, and also supplies a quantity of interesting information on the form of the tongue and hyoid apparatus of birds in general. The old idea that the woodpecker transfixes its prey with its sharped-tipped tongue is probably not yet extinct, but Herr Prevot adds his opposition to this opinion, and states that the insects are agglutinated to its tongue by the sticky secretion with which its surface is copiously covered.

Although the form of the tongue usually corresponds to the shape of the bill, there are exceptions to this rule, as, for example, in the waders, kingfisher, and hoopoe, which, in spite of their long bills, only possess small cartilaginous tongues; in the pelican, indeed, the tongue is altogether rudimentary. In most birds, whose food consists of seeds, the tongue is dart or awl shaped; in others, spatulate; rarely, vermiform or tubular. In some birds, such as the owl, which swallow their prey entire, the tongue is broad and serves as a mere shovel. In the hedge sparrow, nuthatch, woodcock, and others the tongue is bifid or trifid at its apex, while in the hummingbirds the tongue is split into two branches almost to its base, and is used for actually gripping the small insects on which these resplendent little creatures subsist. In a family of parrots (Trichoglossidæ) the tongue is provided at its apex with a brush of some 250 to 300 hair-like processes. In the parrots, the tongue is thick and fleshy, devoid of horny barbs or papillæ, and is even suspected to possess sense organs of taste. Herr Prevot concludes his concise but interesting paper with some remarks on the influence of the form of tongue in birds on their varying powers of articulation. It is interesting to note that the parrots, the form of whose tongues most closely resembles that of man, are able to imitate his language more clearly than any other birds.

American Well Boring Machinery in Russia.

Under date of November 9, Consul Bornholt, of Riga, in his annual report, refers as follows to American well boring machinery:

Several private artesian wells have been placed at the disposal of the inhabitants, but these not being sufficient to meet the demands, the municipal council has under contemplation the sinking of twenty or thirty artesian wells in different parts of the city. As the United States are ahead of all other nations in deep well boring, I have interested myself for the introduction of American machinery for this purpose, and trials are now being made with steam drilling machines from New York, imported by a party in Riga. If these trials are successful, well digging will be carried out on a large scale in this country on the American system.

Improvements in New York Harbor During 1894.

During the past year an extensive series of improvements have been carried out in New York Harbor. Work has been in progress at nineteen different points. The work consisted in dredging out the shallow channels, in removing masses of rock or land which has stood in the way of vessels, wrecks have been removed, new sea walls and embankments have been built, measures have been taken to provide a more perfect defense, and a general modification and improvement of harbor lines is under way. Since New York has the most important harbor in the country, no trouble or expense has been spared in these improvements. During the year the government has expended about $1,000.000.

One of the most important improvements consists in dredging away and deepening the channel between Governor's Island and Brooklyn, which is known as Buttermilk Channel. The channel was made dangerous by the presence of three shoals which have long been a menace to navigation. These have been dredged away to a depth of 26 feet mean low water and with a width of 440 feet. Some 345-090 cubic yards of earth have been removed. Work has also been in progress on the channel between Staten Island and New Jersey. Previous to the improvements in this quarter the channel had a depth of but 9 feet, and this has been enlarged to a channel 400 feet wide and 13 feet deep. Work is so nearly complete as to permit vessels to pass through the channel, and the amount of commerce reported for the past year is 3,483,911 tons.

The channel of Gowanus Creek and Bay, near the southwestern part of the city of Brooklyn, has also been considerably widened and deepened. The original channel was only from 7 to 12 feet deep at mean low water, and a depth of 18 feet for a distance of one mile is to be provided. During the year 1894, $56,298 have been expended and some 342,270 cubic yards of earth have been removed at this point.

Extensive improvements have also been made in the Harlem River and Spuyten Duyvil Creek; originally there was no navigation between these two streams. The object of the improvements has been to provide a navigable channel between the East and Hudson Rivers. The original plans were estimated to cost $2,700,000. During 1894 a channel has been dredged in the Harlem River 9 feet deep mean low water and about 160 feet wide to within 200 feet of the east dam. In the Spuyten Duyvil Creek a channel of 9 feet deep, mean low water, and 150 feet wide has been dredged from the Hudson River to within 140 feet of the west dam. About $108,539 has been expended on the work during the year. Work has been also in progress to deepen and widen the channel of Sumpawanus Inlet. This channel is being dredged to provide a waterway 5 feet deep at mean low water with a width of from 100 to 150 feet, and for a distance of 4,500 feet. The commerce of this inlet for the past year has been 1,350 tons.

Important improvements have, furthermore, been made during the year in the main entrance to the harbor. The original depth in midchannel was 23·7. This was the least depth, and a great proportion of the commerce of New York could only cross the shoals at high water. The plan for improving this channel provides for dredging a channel 1,000 feet wide and 30 feet deep at mean low water. The estimated cost of the work was $1,490,000 for dredging 4,300.000 cubic yards of earth, and it was expected that the entire cost of improvement would be between $5,000,000 and $6,000,-000. So far about $2,000,000 have been expended. The amount expended during 1894 was $70,964, and some 348,963 cubic yards of material were removed.

Treatment for Sprained Ankles.

In these days of bicycling, skating, tobogganning, and other out-of-door amusements incident to the seasons, accidents of various kinds are daily occurring, not usually serious, but often painful when seemingly slight.

From time to time one hears of different means of caring for sprained ankles, turned ankles, twisted wrists, etc., but the way now in vogue seems to give better results than any in the past.

It is generally within an hour after the accident that you are called in to see the case. The patient is suffering very severely, and wanting very much to know if "anything is broken." After examining for fractures, the Southern Medical Journal recommends the part to be bathed in extremely hot water, every hour or two, for a period of fifteen minutes at a time. Have the water just as hot as the patient can bear it, and apply with a sponge or cloth, rather than allow the ankle to lie in the water. Then dry and let the part rest quietly, wrapped in flannels, when an application of hamamelis, or veratrum and hamamelis, may be made.

Before retiring, apply a flannel bandage tightly around the swollen part, only being careful that the circulation is not shut off.

It is surprising how the hot applications relieve the pain and produce absorption, and how the bandage, by pressure, prevents swelling and inflammation.

Correspondence.

STORAGE BATTERIES CHARGED BY GRAVITY BATTERIES.

To the Editor of the SCIENTIFIC AMERICAN:

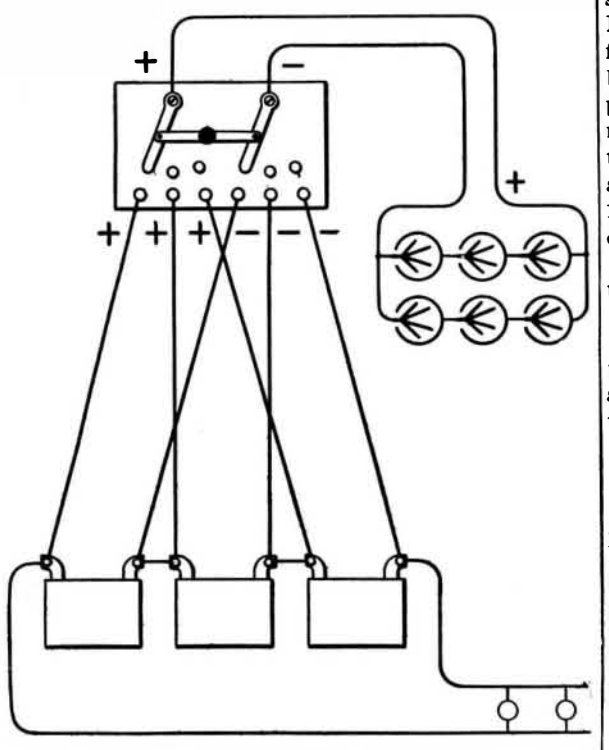
I see in your Notes and Queries that you have a good many inquiries about storage batteries being charged by gravity batteries. I inclose a copy of my plant that I am using. It has given the best of satisfaction up to the present time.

I offer it for publication, as it might help some person using a storage battery.

I have three storage batteries composed of five plates each (plates 6 by 8½ inches, perforated, and filled with red lead for the positive and litharge for the negative). I use six Crowfoot batteries for charging.

The Crowfoot batteries are connected three in series and two in multiple arc. The storage batteries are connected in series, and each battery is connected on a binding screw of a three-point pole-changing switch, with the Crowfoot battery. The switch is moved one point every twelve hours, so that each battery gets its supply of current. These batteries have been in use for a year and a half, and I have not had any trouble with them (excepting when the Crowfoot batteries had to be renewed).

I am at present using two lamps of two candle power, and the longest time that I have used them at



one time was three hours. By looking at the diagram above I think my explanation will be better understood.

E. C. DREWS.

The Dalles, Ore.

Disastrous Effects of the Hot Winds.

To the Editor of the SCIENTIFIC AMERICAN:

It is quite generally known that a part of Texas, the Indian Territory, Western Kansas and Nebraska and part of Colorado suffers greatly from what is known as the "hot winds," a south or southwesterly wind that, owing to its high temperature and arid state, withers and, as the inhabitants of those regions say, "burns up" everything that grows above the ground. Its blasting effects are so terrible sometimes that every green thing, especially cultivated crops, is completely killed in a few hours, though the wind continues sometimes to blow for several days. Its destructive effects are not always however in proportion to the length of time it continues.

The suggestion I wish to make is this: A series or chain of lakes or very large reservoirs could be constructed in Texas or New Mexico, or further north in the Indian Territory and Colorado, which would reduce the temperature and at the same time render more humid the said destructive winds, and also increase the rainfall to the north, northeast, east and southeast from those lakes. Those advantages would not be the only ones that would result from such great reservoirs, but the country in the vicinity of the lakes, and as far therefrom as it would be practicable to make irrigating canals, could be greatly benefited by such a system. Besides the advantage that should be hoped for by way of rendering the "hot winds" harmless and increasing the rainfall, the district that should be irrigated would have its productive capacity doubled or trebled.

The rainfall over this vast plain over which the "hot winds" blow is not sufficient; in fact, the year is the exception when the rainfall is sufficient.

If such a plan as here suggested were put into practice, the benefit in the way of evaporation would not be dependent on the water surface alone, but from the irrigated land also. Hence the area thus contributing moisture to the arid winds would be large.

Is it not a matter that Congress should give some attention to? It seems that the officials who have the directing of internal improvements should see to it that a man be appointed to make the preliminary explorations and surveys, also estimates of the probable cost of dams and the general feasibility of such improvements, and the surface water supply, and also subterranean water supply.

If Congress were to make the necessary appropriation, the preliminary work as above outlined could be readily made.

There seems to be no law obstructing the way to such a course, for the government has a civil engineer in Colorado and two or three other States whose duties are principally confined to irrigating matters. It seems from this that no law stands in the way of such work being conducted in the States here named, as well as any other State.

BENJAMIN HILL.

Tiona, Pa., January 21, 1895.

Protecting Telephone Wires from Danger Due to Contact with Trolley Wires.

In the SCIENTIFIC AMERICAN of January 5, under "Notes and Queries," L. A. F. asks: "How can the danger resulting from the falling of a private telephone wire onto a trolley wire be avoided?"

You answer by guard wires placed over the trolley wires. In our city there are no guard wires, and as a result the fire alarm, police signals, and telephone instruments are burned out during sleet and ice storms. My experience has been, on a grounded line to place a fusible cut-out in the line at each end of the circuit before the wire connects with the instrument. A simple cut-out may be made and cost but a dime by connecting a strip of tinfoil 4 inches long, ⅛ wide, having the ends held in place by a brass spring at each end, and under this place a piece of asbestos 8 inches by 1½, to prevent the wood from taking fire, if a cross occurs.

For short lines use metallic circuit. It is much safer than to ground the instrument.

A. C. B.

Meriden, Conn.

[The trolley wires should be provided with guard wires or something should be done to protect person and property from the danger incident to contact of telephone and telegraph circuits.—ED.]

Telegraphy in Texas.

The Texas rule allowing senders of telegraph messages to recover for damages to their feelings from delay in transmitting the dispatches leads to an enormous amount of litigation against the telegraph companies. In some of the digests almost the whole section referring to actions against telegraph companies consists of references to the decisions of the Texas courts. Many of the messages relate to the sickness or death of relatives. In one of the latest cases it was shown that the message could not have been delivered in time to enable the woman to whom it was addressed to be present at the funeral of her father, whose sickness was reported in the telegram. She endeavored, nevertheless, to obtain damages, on the ground that if she had received the message promptly, she might have telegraphed asking that the funeral be postponed, and so might have been present at the services. The supreme court reversed the judgment for $500, obtained against the company. A verdict of $2,000, obtained by a father who had not received promptly a message concerning his sick son, one of $500 for delay in delivering a telegram announcing the funeral of a brother, and one of $1,000 for failure to deliver promptly a message telling of the sickness of a half sister were not set aside as excessive. In one case it was shown that there was no great affection between the person to whom the telegram was addressed and the sick relative, but the verdict was allowed to stand. In some cases the amount of mental anguish could not have been great, but the Texas juries, with great regularity and promptness, find verdicts against the telegraph companies when such cases are brought before them.

A Loose Set Screw.

On Thursday, January 10, the fly wheel of the Atlas engine at the factory of Page Bros. & Co., 233 Cambridge Street, Boston, exploded with a terrific crash, smashing the wheel into hundreds of pieces and tearing up floors and partitions about it. One man was quite seriously injured by the flying masses of iron, and was taken to the hospital. The other employes were badly frightened and some narrow escapes are reported. The engineer was sitting in the boiler room near the engine when he noticed the speed was increasing. His first thought was the engine, but before he could get to the throttle the exhaust pipe had broken, and he immediately shut off the steam at the boiler, but before this could be done the wheel had exploded, the time from the first acceleration of speed to the final burst being scarcely a minute.

The engine was a balanced slide valve with shaft governor, and the bursted wheel was 8 feet in diameter, 15 inch face, and the rim averaged ½ inch in thickness. The shaft governor is of the type common to these engines. A loose set screw was the immediate cause of the disaster.