

gives notice on board of the approach to shoal waters. A device called a "kite," shown in Fig. 6, is trailed behind the steamer, as shown in Fig. 5, being attached to the end of a piano wire wound upon the drum of the sounding machine. The kite is attached to the wire in such a manner that it dives under the stern of the boat to the minimum depth.

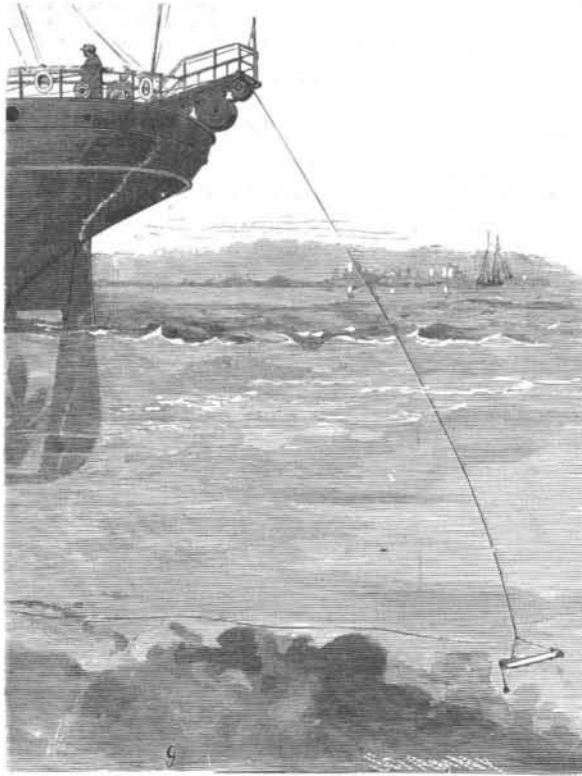


Fig. 5.—JAMES SENTRY AND SOUNDING MACHINE.

Should the steamer enter shallow water, the lever at the lower end of the kite strikes the bottom and releases the front end of the kite so that it trails behind the steamer at or near the surface and offers less resistance at the machine. The diminished pull causes a bell to ring on the sounding machine and another on the bridge. The sounding machine is adjustable for different depths. On the deck at suitable places are placed electric signaling machines, made by Elliott Brothers, of London, for communicating with the engineer of the paying-out machines and with the ship's engineer.

The Mackay-Bennett came on from Halifax in September last to lay cable for reporting the yacht race. The shore end of the cable was dropped at Coney Island at a point east of the Oriental Hotel. From this point it was laid out to the lightship, and an extra mile was run out in great coils to enable the ship to change her position if necessary. By the use of this cable, reports of the movements of the yachts were instantly transmitted to New York City, so that the progress of the race was better known to observers of the bulletins than to most of the actual spectators. Through the courtesy of Captain E. G. Schenk, Chief Officer W. F. Linton, Engineer J. W. Burn, and Electrician C. Priest, we were enabled to thoroughly inspect everything on board the steamer.

#### THE LOVELL ADJUSTABLE HANDLE BAR FOR BICYCLES.

The subject of adjustable handle bars for bicycles has received much attention during the past season. We illustrate in our present issue a new system of adjustment, which seems to possess all the desirable requisites while avoiding the difficulties which have been encountered in other ones put upon the market. In the upper part of the tube or handle bar stem is a double swivel joint, which receives the ends of the two handle bars, they being secured by bolts passing through them. The handle bars terminate in lugs, which fit within the swivel joints and which lugs are on their inner periphery provided with teeth. When the handle bars are in position, these teeth mesh into each other. This makes the movements of the bars interdependent. If one bar is raised, the other one rises with it, if depressed, the other one is depressed; hence the handles are always on the same level. Another feature about the bar is, that the inclination of the handles is invariable. In the usual type of han-

dle bar when swung up or down the inclination of the handles varies so that in the upper and lower positions they are very uncomfortable, the inclination being only correct in one position. In the Lovell bar the inclination is always correct—one of the minor advantages of this bar applied in the storage of a bicycle when it is kept in the hallway of a house or other restricted space. This especially applies to shipment on trains, and when crated they can be shipped with bars in place, but dropped, there being no loose and attached handle bars to be tied on or otherwise disposed of.

The cuts show the bar in detail. Fig. 1 shows the handle bar when not in use or when ready for shipping on the wheel. Fig. 2 shows the mode of adjustment. Fig. 3 shows the bar inverted to its full height. Fig. 4 shows the bar about where it would be used by the average rider. Fig. 5 shows it as in use by a fast rider or racer.

As can be seen from Figs. 1 and 2, the handle bar can be adjusted to any position desired, so that the rider can have his handle bar adjusted to where it suits him best. This adjustment does not in any way change the position of the grips, and is the only one of its kind on the market which gives any adjustment and at the same time leaves the grips in a comfortable or natural position.

The manufacturers are the J. P. Lovell Arms Company, Boston, Mass.

#### Exploring the Colorado River.

The San Francisco Call says: 2d Lieut. F. M. Davis, 4th Cavalry, who accompanied 1st Lieut. C. L. Potter, of the Engineers, in his late expedition down the Colorado River, is busily engaged on his official report of the undertaking. Although the report is primarily prepared for official eyes, it will be no ordinary compilation of technical information and forbidding statistics. On the contrary, the report will record one of the most thrilling experiences which human beings ever survived. Speaking of their adventures, Lieut. Davis said recently: "Some time near the 1st of October Lieut. Potter received orders to proceed to investigate the possibilities of the Colorado River for navigation purposes, from the mouth of the Virgin River to Yuma. The understanding was that he was to proceed to the Needles and from there be towed up the river, a distance of 250 miles, by Indians."

The adventures of the party, as described in the Call, were very thrilling. As Indian boatmen refused to brave the cruel rapids of the treacherous river, two old trappers were hired, who, for \$5 a day, were willing to undertake the risk. They were experienced watermen and cool headed. They had bow and stern lines, each 200 feet long, and at one point had to send the men up on cliffs 100 feet high, from which, by the aid of the lines, they would "snub" the boat around the ledges of the canyon walls. In one day, within six and one-half miles, they shot fifteen dangerous rapids.

which we might climb and draw the boat. It was useless, and to attempt to run that frightful place would have been madness. It was at this point that Major Powell's men abandoned him. We searched for the trail by which they escaped from the prison-like inclosure, but in vain. In our explorations I had sprained my ankle, and we were compelled to lie over a couple of days until I could walk. In the meantime Lieut. Potter investigated several branch canyons in the hope of finding a means of egress. On the Arizona side he followed a canyon for eight miles, to where it abruptly ended in a perpendicular wall 4,000 feet high.

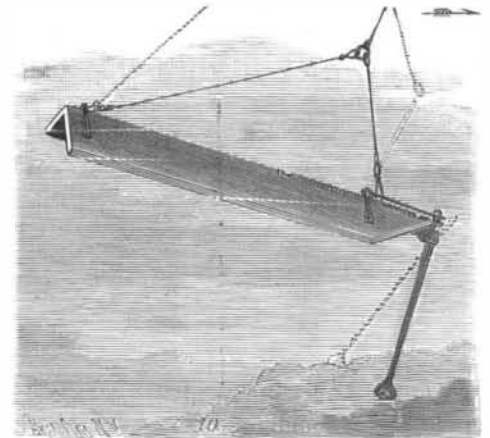


Fig. 6.—THE KITE.

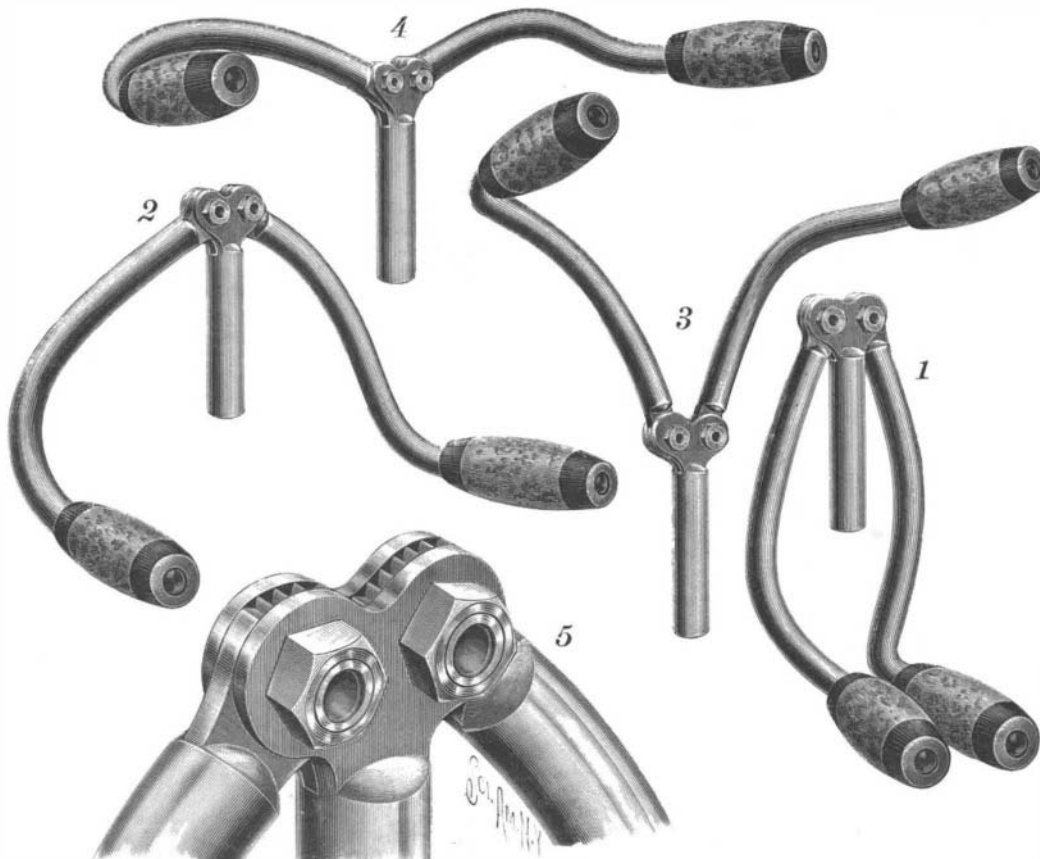
He followed a canyon on the Colorado side fifteen miles with a similar result. At last we determined to take desperate chances. Taking all our provisions and outfit from the boat, we prepared to attempt to follow a faint bighorn trail for a few miles. Lieut. Potter and the rest of the party went on ahead, while I stayed with the boat. The plan was to turn the boat loose and let it shoot the rapids empty and unguided. Lieut. Potter and his party would attempt to catch it as it went by. I waited half a day, and in that time the lieutenant had reached the river three miles further on. Then I turned the boat loose, and in ten minutes it shot by them like a race horse. That left us but one alternative, to follow the bighorn trail. Taking provisions, a blanket each, and our firearms, we started on this perilous journey. Sometimes our path was 100 feet wide, sometimes for 100 feet we had scarcely six inches to cling to. In the latter situation our sensations were horrible. Over 1,000 feet below us yawned the black chasm; beneath us the rock was treacherous and slippery. It was always level, always the same dizzy height from the white, brawling stream below. For twenty-two miles we followed this dangerous trail. Then, with feelings of joy, we emerged upon the Hualapais Desert. We were three days in crossing this. We had plenty of water and provisions, but the men's shoes had given out and they suffered greatly from the hot sand and the cacti. On the third day we reached the Union Pacific Railroad and were taken up. We then proceeded to the Needles and completed the trip as originally contemplated without incident. We found that the river could not be navigated advantageously by any vessel drawing more than two or three feet of water without the expenditure of an immense sum of money."

#### The Under-running Trolley Patent.

Judge Townsend, of the United States Circuit Court at New Haven, Conn., on the 7th inst., rendered a decision in the suit of the Thomson-Houston Electric Company vs. the Winchester Avenue Railroad Company, declaring one of the Van Depoele under-running trolley patents in suit to be invalid and sustaining the other. These patents are controlled by the General Electric Company.

The patents upon which suit was brought are Nos. 495,333 and 495,443, both bearing date of April 11, 1893. The broad character of the patent No. 495,443 is illustrated by the 6th claim, which is as follows:

6. In an electric railway, the combination with a suitable track and a supply conductor suspended above the track of a car provided with a swinging arm carrying a contact device in its outer extremity and means for imparting upward pressure to the outer portion of the arm and contact, to hold the latter in continuous working relation with the under side of the supply conductor, substantially as described.



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Before them seemed almost certain destruction, and to turn back was impossible. The further they went the deeper and blacker became the canyon. Concerning rapid No. 26, Lieut. Smith says:

"Here on both sides towered the steep black walls, 1,000 feet high. Between these walls for a mile there was nothing but angry, hissing foam. We examined first one side and then the other for ledges along