THE SWORD WALKER.

BY WILLIAM B. CAULK.

Of all the daring tricks that have been introduced in the circus, none have caused more comment than the one in which a person, generally a lady, walks with bare feet up a ladder of sharp swords, treading directly on the sharp edges without any injury to the feet.

It is amusing to a person who is acquainted with the secret to hear the many explanations of "how it is done" offered by the spectators, yet none of them ever come near guessing the truth. This secret has been so jealously and successfully guarded that very few, even among the best informed experts know how it is performed.

That the explanation is as simple as the trick is surprising, the writer will now show.

From the illustration it will be seen how the swords are arranged in a rack with the cutting edges on top. The rack is usually about seven feet high, and eight swords are used. One of the most necessary points in the preparation for the trick is that the rack should stand firm, and the swords fit snug and tight in the slots made to receive them.

Usually the inspectors are invited to examine the rack as well as the swords, and paper is cut with the swords to show that they are really sharp. The secret is not in the swords or rack, but in the preparation of the performer's feet. In a pint of water as much alum is dissolved as the water will readily take up. To the alum water is added as much sulphate of zinc as will lie on a silver dime, and thoroughly dissolved.

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A few minutes before doing the act the performer bathes the feet in this solution and allows them to dry without wiping. Just before leaving the dressing room the feet are dipped for a moment in as cold water as can be secured and at once wiped dry without rubbing

By placing the feet squarely on the swords there is no danger, but great care must be used not to allow the foot to slide or slip on the sword, or the result would be a very bad accident.

On leaving the circus in which one has seen the above act, visitors are almost sure to see before the ever present side show a large painting on which is the representation of a Mexican dancing with bare feet in a shallow box filled with broken glass.

If you are of an inquisitive nature, and have seen a lady walk with bare feet up a ladder of sharp swords, you enter the side show to see this new wonder.

On a raised platform is found a box about four feet long, three feet wide, and six inches deep, the bottom of which is covered with broken glass. In a few moments a man dressed in the Mexican costume appears on the platform, and proceeds to break a few old bottles and throw the broken glass in the box, then remove his shoes, shows his feet to be free from any covering, steps in the box, and dances among the glass. After he has finished dancing he shows his feet to be uninjured, and retires. The trick is performed in the following manner:

Secure a number of thick glass bottles, break them in rather small pieces and file or grind all the sharp edges round. This stock of glass you place in the center of a box made according to above measurement. Now soak your feet in strong alum water and wipe dry, and give them a thorough rubbing with pulverized rosin. Dust the inside of your shoes with rosin, put them on, and go upon the platform. Take some old lamp chimneys and bottles, break them in bits, and throw this fresh broken glass in the box around the edges and in the corners, not in the center. Remove your shoes, step in the center of box among the prepared glass, and do your dancing. Avoid the sides or corners of box where you have thrown the glass, and you run no risk of cutting your feet, especially if you use plenty of rosin.

GLASS DANCER.

THE late Robert H. Lamborn bequeathed $200,000 to the Academy of Natural Sciences of Philadelphia.

The Electrical Conductivity of Cement and Concrete.

Electrical engineers, especially those engaged in railways and similar works, would do well to study a recent paper by Dr. Lindeck, in which he describes some experiments which he has been conducting in order to determine the electrical conductivity of cement and concrete of various kinds. He finds that the resistance per cubic foot of pure cement blocks, when dry, is about 144 ohms, and that this falls as low as 43 ohms after immersion for about twenty-four hours in water, while it rises to 820 ohms after being exposed to a heat of 212° Fah. The admixture of sand or gravel with the cement increases its electrical resistance. In cases where blocks were made with one part of cement to seven parts of gravel their resistance when dry amounted to about 18,000 ohms, when wet to 72 ohms, and after exposure at 212° Fah. the resistance rose to about 2,000,000 ohms. If the highest results obtained for airtight concrete be taken at about 1,670 ohms per cubic foot, an insulation resistance of about ½ ohm per mile is obtained. These considerations become important when adopting the German practice of laying the rails of electrical railways in concrete. From experiments made with what is called asphalt concrete, it appears that the current range is very trifling, and if ordinary cement is used, it is only necessary to lay a thin layer of the asphalt concrete over it. The cost is then not excessive. Asphalt concrete consists of 50 per cent of broken stone, 20 per cent of coarse gravel, free from loam and sand, 12 per cent of asphalt, 8 per cent of coal tar pitch, and 10 per cent of coal tar. The original paper appeared in the Electrotech. Zeits., 1896, p. 180, says the English Electrical Review.

The Ascent of Aconcagua.

A special telegram to the Daily Chronicle announces that Mr. Fitzgerald and Zurbriggen, the Swiss guide, began to climb Mount Aconcagua, in the Andes, on Christmas Day. At a height of 21,000 feet, Gussfeldt's card, dated March, 1883, was found in a tin box, says Nature. The explorers had to descend to the valley for three days, but a second attempt was begun on December 30, and an altitude of 22,500 feet was reached on January 2. A third attempt to get to the top of Aconcagua was commenced a week later. The arête between the peaks, at a height of 23,000 feet, was reached on January 14. Mr. Fitzgerald then had to turn back, but Zurbriggen reached the summit, which is over 24,000 feet high. This is the greatest altitude yet attained by mountaineers. The following item of climbing history is abridged from an article in the Chronicle: "The serious business began with De Saussure, and has been going on ever since. He was soon followed by Humboldt, who climbed Chimborazo (19,000 feet) in 1802. The next climber to set foot on that mountain was Mr. Whymper, in the year 1880. The Jungfrau was first ascended in 1811, and the Finsteraarhorn in 1812. The other Swiss peaks have fallen one after the other—the Wetterhorn in 1854, Monte Rosa in 1855, and the Matterhorn in 1865. Mr. Freshfield scored the first great victory when he climbed Elbruz (18,526 feet) in 1868; but long before that Gerard had climbed to 19,410 feet on Porgyul in 1818. The highest climbs of later years have been those of Sir Martin Conway, who climbed Pioneer Peak, in the Himalayas, in 1892, and of Mr. Mummery and Mr. Hastings, who climbed to 21,000 feet on Nanga-Parbat. Dr. Gregory reached to about 16,000 feet on Mount Kenya, in Central Africa (20,000 feet high), and Hans Meyer reached to 16,830 feet on Kilima-Njaro. In Asia there are four colossal mountains which still defy all efforts. Mount Everest (29,000 feet) still lies far beyond the reach of man. Dapsang (28,700) is almost equally inaccessible. Tagarma (25,800) and Khan-Tengri (24,000) have yet to be scaled. Similarly, in Africa, the highest mountain is still a virgin; and though Mount Cook (12,349) has been climbed in New Zealand, Charles Louis (20,000) still remains unascended in New Guinea."

GLASS SOLUBLE IN WINE.—M. Henri Lavouroix has been making a series of experiments to find how much effect the quality of glass in a bottle has on wine, and the results have aroused the interest of wine dealers, says Invention. He states there is a direct chemical reaction between the glass and the material within the bottle, and he quotes a case in illustration. A wealthy retired merchant bought in France a lot of costly and rare wines in casks, samples of wine from each cask being given to him by the wine merchant. The new owner proceeded to have his wine racked off and bottled. Some days later some of the wine was served on his table, and he detected a strange, unpleasant taste which the wine that he had sampled did not have. A fresh bottle was served, and this was found to be similarly affected. Bottle after bottle was opened, with the same result, and the owner brought suit against the man who had sold him the wine, alleging that it was not like the samples. During the action some of the bottles were brought into court, and it was found that the glass in them had become opaque. These bottles were handed to a chemist, together with similar bottles that had never been filled with wine. An examination showed that the bottles that had been filled had lost a part of their lime, potash and soda, which had passed into solution, forming compounds with the acid ingredients of the wine that rendered it unfit to drink.

A CYCLE factory has been established at Copenhagen, Denmark, with an output of over 2,000 wheels per annum.