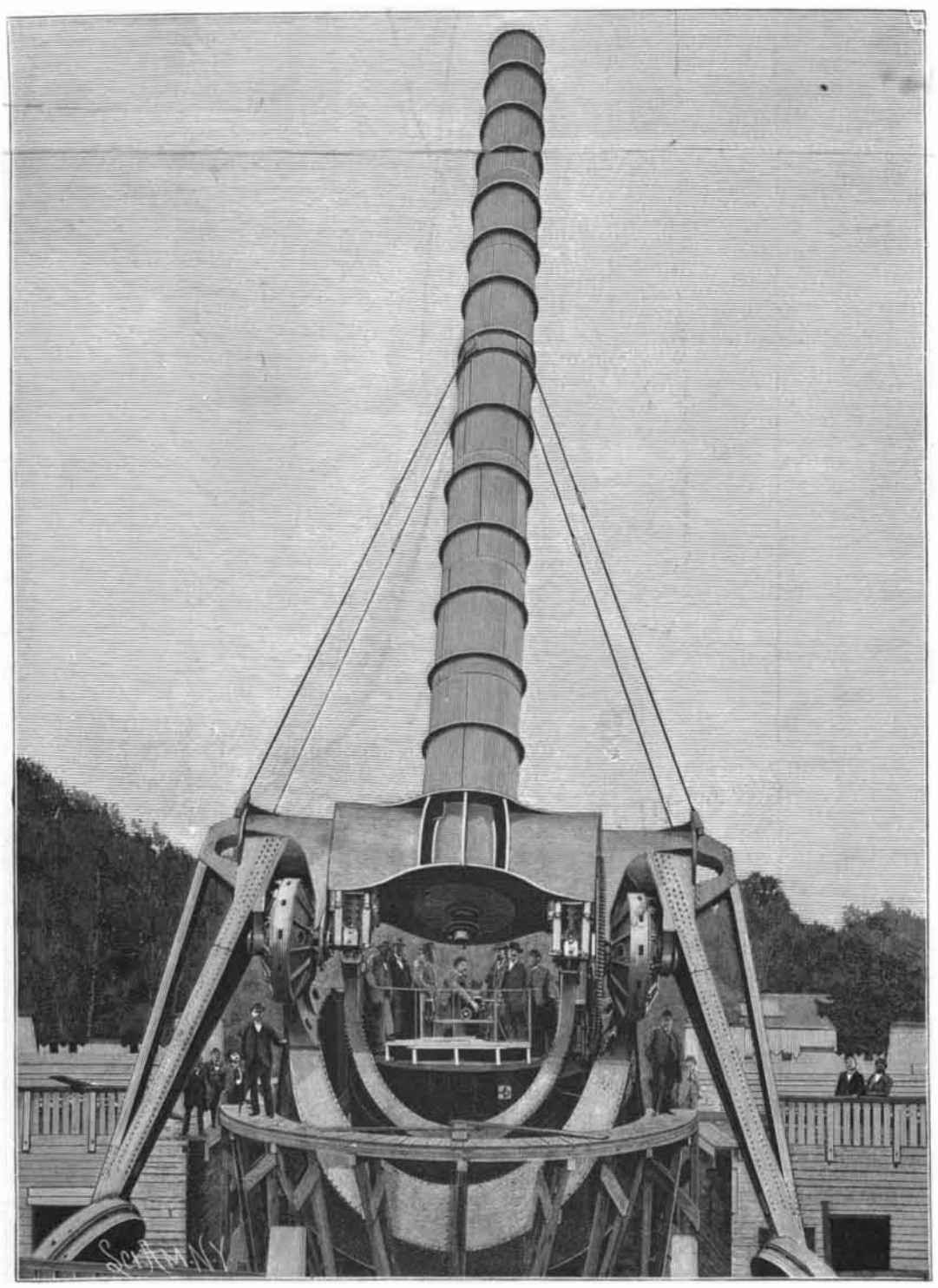
A TELESCOPE WITHOUT AN OBSERVATORY.

Among the attractions at the Berlin Industrial Exhibition of 1896 was the oddly mounted telescope shown in our engraving. It is customary to erect large telescopes within a movable dome, but in this case the instrument stands on an elevated platform in the open air, and the tube is protected by an extra cylindrical envelope or shell. A telescope of this type is almost invariably pivoted on an arm reaching from one side of the tube near its middle, whereas the two arms which constitute the "declination axis" of the great Berlin glass start from one end, close to the eyepiece. The trunnions which support a cannon are commonly placed nearer one end than the other; but the gun is evenly balanced nevertheless, because there is vastly more metal around its breech than around its muzzle. But at first glance the corresponding projections from this telescope tube seem to be so placed as to leave the weight, like the handle of a jug, all on one side. Careful scrutiny, however, reveals the fact that a massive bow or horseshoe, which might be mistaken for a part of the supporting structure, is really connected with the tube so as to form a counterpoise. The observer, therefore, sits motionless on the little platform formed by the prolongation of the polar axis, which platform is stationary, too. He does not change his elevation as in other observatories. Whether he aims the mighty tube at the zenith or the horizon, the eyepiece remains in the same spot, merely changing its angle. And the glass is so lightly hung, too, that he can shift it with his finger, although electrically operated machinery is usually employed instead. There is also a polar axis, lower down, and not shown in the picture.

The mounting is so arranged as to receive two objectives, of which one is designed for direct visual, the other for spectroscopic and photographic observations. For this reason the latter will be a double objective of short focal length, 20 to 23 feet, and large aperture, 43⅓ inches. It was exhibited in an unfinished condition, as the means for the purchase and polishing of the enormous lenses, which have been very successfully cast by Dr. Schott, could not be immediately raised. The rough disks of glass for the lenses of the telescope have been furnished by Dr. Schott and Genossen, of Jena, while the polishing has been executed by Messrs. C. A. Steinheil, of Munich. The mounting of the instrument was intrusted to the Berlin Maschinenbau Anstalt C. Hoppe, who was assisted by the firm of G. Meissner, Berlin, in the execution of the finer mechanical portions. The other objective, on the contrary, is completed, and has an aperture of 27½ inches and a focal length of 68 feet.

In focal length the Berlin glass makes another departure from usage. A length fourteen times the aperture used to be considered the standard proportion, from which, for various special reasons, there was often a departure. In very large telescopes, like that at the Lick Observatory, the focal length is about eighteen or nineteen times the diameter of the object glass.

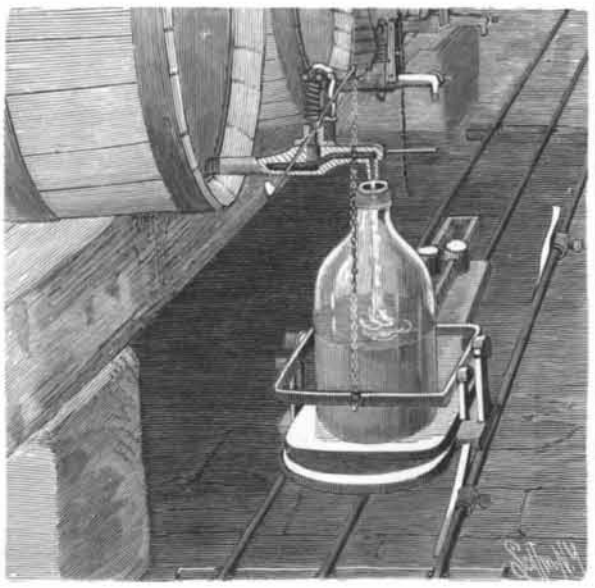
The new refractor at Berlin has a tube 68 feet long. This makes the proportion thirty to one. Among the advantages resulting from this remarkable focal length is an improvement in adaptability to photographic work. According to the Illustrirte Zeitung, an image of the sun 19½ centimeters (7·67 inches) in diameter is thus obtained on the sensitive plate, and this will stand a greater enlargement without losing distinctness than any solar photograph obtained elsewhere. From this fact and from the stress which is laid on the photographic collections in the libraries and lecture rooms of the new observatory, it seems probable that the instrument will be devoted largely to that class of work, though not to the exclusion of visual work. The telescope is the property of the Astronomical Observatory of Grunewald.



A TELESCOPE WITHOUT AN OBSERVATORY.

MEASURING LIQUIDS BY WEIGHT.

A simple device by means of which the flow of liquid will be automatically cut off when a definite weighed quantity has been delivered to a receiving vessel is shown in the accompanying illustration, and has been patented by George W. Curtis, of Long Grove, Iowa. As will be seen, the device is mounted on tracks or guideways extended along the front of a row of barrels,



CURTIS' LIQUID MEASURING DEVICE.

so that it may be easily moved from one barrel to another. The scale comprises a base plate and double scale beam extended from a rectangular frame portion fulcrumed on posts on the base plate, there being suspended from the frame a swinging platform on which the bottle or receiving vessel is placed. Outside the tracks is a rod on which are stops to fix the proper position of the scale when it is moved in front of a barrel, and the top of the scale platform is marked to facilitate centrally placing thereon jugs or bottles of different sizes. The faucet, which is shown partly in section in the engraving, has a vertically moving plug valve, whose stem extends upward through a bracket, the valve being downwardly pressed by a coiled spring. To lock the valve in open position, an angle lever is fulcrumed in bearings in the bracket supporting posts, the upper end of the lever being connected with the valve stem and its lower end being adapted to engage a hook latch. One end of the rock shaft on which is the hook latch is extended through the bearing post and carries a rod whose lower end is provided with a counterbalance weight, while its upper end is detachably connected by a chain with the frame portion of the scale. As an additional means of easily determining the proper position of the scale and neck of the bottle under the faucet, a guide rod may be mounted on a pivoted block near the outer end of the faucet, such rod being out of the way when turned horizontally, but, when turned vertically, engaging one side of the bottle neck. The bottle or jug, when placed on the scale platform, is balanced by a weight on one of the arms of the scale beam, and the proper weight for the desired quantity of liquid to be delivered is placed on the other arm of the scale beam. The chain connection is now made between the rectangular frame and the counterbalanced rod, and the valve is opened and held in open position by engaging the lower end of the angle lever with the hook latch, when the liquid may be left running, as its flow will be automatically cut off on the delivery of the proper quantity by the rocking of the scale beam, as the drawing down of the chain causes the release of the latch engaging the angle lever, and the coiled spring on the valve stem then closes the valve.

Ingenious Peruvian Potteries.

A long, slim neck is a distinguishing feature of much of the Peruvian pottery, and nearly every vessel is ornamented with a figure of some sort, having holes to represent eyes and other openings. These afford a passage for the air forced out by the liquid when poured into the vessel. By an ingenious contrivance the air in escaping produces a sound similar to the cry of the creature represented. Thus a utensil decorated with two monkeys embracing each other, on having water poured into or from it, would give a sound like the screeching of those animals. One decorated with a bird would emit birdlike notes, while a mountain cat on one jar would mew, snakes coiled around another would hiss.

The most curious that we have seen was the figure of an aged woman. When the jar was in use her sobs became audible, and tears trickled down her cheeks. The manufacturers seemed to have known all about atmospheric pressure. Dr. Le Plongeon had in his own collection a piece that demonstrated this. It represented a double headed bird. The vessel had to be filled through a hole in the bottom, and yet in turning it over not a drop would spill, but the liquid would readily flow out when the jar was simply inclined. The Peruvians were good portraitists, and many of the faces represented might pass for likenesses of people now living on the coast.—Alice D. Le Plongeon, in Appletons' Popular Science Monthly.

ACONCAGUA, the highest mountain on this hemisphere, is to be thoroughly explored by an expedition fitted out by Mr. E. A. Fitzgerald, the explorer of the New Zealand Alps, which recently left England for Buenos Ayres. A geologist, a surveyor, and a naturalist form part of the expedition, together with the Alpine guide, Mattias Zurbriggen. Mr. Fitzgerald's observations will be on the effect of the atmosphere of mountain heights on the human system, as he intends to scale Mount Everest, in India, the highest mountain in the world, if he succeeds in getting to the top of Aconcagua.