

been fastened upon it. In order to do this I made a strong ring of steel, into which I forced the plate, so that the dis-jointed pieces were again united, then, by means of a pantograph, I marked all its holes, etc., on a plate of metal, on a scale four times as large as in the original plate, with the utmost care, verifying each step of the work over and over again so as to avoid any chance of error. This done, I made a new plate of the same size as the first one, to which I carefully transferred the marks obtained by the pantograph. I made each hole exactly similar to the corresponding hole in the original plate, with the grooves, etc., duplicates of those in the other. When I came to set the plate in position and mount the other pieces upon it, I found that although not perfect, yet it went very satisfactorily. The only alteration I found necessary was with the quarter hammer, which I had to change a trifle. It was a complete success, if you take into account the time I had saved. I became convinced then of the possibility and advantage of tracing a watch upon a certain scale, and of keeping the same scale for other watches, thus developing the idea of interchangeability which I brought to further perfection later." Such are the facts in the inventor's own words in regard to the origin of the process vaunted so highly across the Atlantic, and which has been in use in Geneva for fifty years and more.—*Translated for The Jewelers' Journal.*

### THE TEMPLE OF BAALBEC.

The ruins of the ancient city of Baalbec, situated on the plain forty-three miles north-west of Damascus, are the wonder of modern architects.

Everything is colossal. The area is larger than that of the temple of Jerusalem. We may begin with the walls, which are half a mile around, and of such height and depth as are rarely attained in the most tremendous fortress. When from within I climbed to the top, it made me giddy to look over the perilous edge to the depth below; and when from without the walls I looked up at them, they rose high in the air. Some of the stones seem as if they had been reared in place, not by Titans, but by the gods. There are nine stones thirty feet long and ten feet thick, which is larger than the foundation stones of the temple of Jerusalem, dating from the

time of Solomon, or any blocks in the great pyramid.

But even these are pigmies compared with the three giants on the western wall, 62 feet, 68½ feet, 64 feet long. These are said to be the largest stones ever used in any construction. They weigh hundreds of tons, and instead of being merely hewn out of a quarry, which might have been on the site, and left to lie where they were before, they have been lifted nineteen feet from the ground, and there embedded in the wall. Never was there such cyclopean architecture. How such masses could have been moved is a problem with modern engineers.

Sir Charles Wilson, whom I met in Jerusalem is at this moment in Baalbec. Standing in the grounds of the temple, he tells me that in the British Museum there is an ancient tablet which reveals the way such stones were moved. The mechanics were very simple, rollers were put under them, and they were drawn up inclined planes by sheer human muscle, the united strength of great numbers of men. In the rude design on the tablet the whole scene is pictured to the eye. There are battalions of men, hundreds to a single roller, with the taskmasters standing over them, lash in hand, which was freely applied to make them pull together, and the king sitting on high to give the signal for this putting forth of human strength *en masse* as if an army was moving to battle. A battle it was in the waste of human life it caused. These temples of Baalbec must have been a whole generation in building and have consumed the population of a province and the wealth of an empire.—*Henry M. Field, D. D.*

### THE CLYNDOGRAPH.

The clyndograph of M. Moessard is a new panoramic photographic apparatus, which by a simple rotation of the objective gives the cylindrical perspective of the earth. A view furnished by the apparatus embraces an angle of 170°, so that a complete turn of the horizon is obtained in two views and a fraction of 20° range. The instrument is based on the principle that a lens or combination of lenses, constituting a photographic objective, may be subjected to any movement whatever without the image it produces on a screen changing its form or position, provided that the movement takes place around the nodal point, behind

which is maintained immovable. This follows from the known property of the nodal point being the point of view of the perspective produced. Suppose, then, there be (1) an objective suspended horizontally and turning round a vertical axis passing by its after nodal point, (2) two vertical shutters fixed behind to right and left of the objective, to limit the field in the horizontal direction and arrest rays too oblique; (3) a screen of cylindrical form vertically centered upon the axis of rotation, and having for radius the distance of the nodal point from the principal focus of the objective, in any position whatever of the objective the lie of the country comprised in the field of the instrument will be projected on the screen. If the objective be put in motion one gets successively for each point of the panorama an immovable image which impresses the eye or sensitive paper while the point remains between the two shutters. In M. Moessard's actual apparatus Telebaat sensitive plates are used to receive the impressions. The instrument is expected to prove useful in preliminary surveying and military operations.—*Exchange.*

### FAMOUS BRONZE DOORS.

Among the monumental works in bronze which emanated from Constantinople some of the most remarkable are the bronze doors which decorated several of the Italian churches, more particularly those which are enriched with inlays of silver. The church of San Marco possesses one brought from Constantinople, and which originally adorned the church of Santa Sophia, and like the bronze horses, was brought to Venice as spoils of war in 1204. Other doors worthy of mention are those at Amalfi, in the Duomo, San Salvatore di Bireto, Atrani, the Benedictine Church at Monte Cassino, and the church at Monte Santangelo—the last four examples were all the gift of one family, the Pantaleoni Viaretta in 1807, "pro mercede animee suae et merita S. Sebastiani, martyris." At Amalfi, in the cathedral of San Andrew, it is Pantaleone di Mauro who gave them, in honor of the Apostle, and for the repose of his own soul. At Monte Cassino another member of the same family gave the bronze doors, and these are enriched with silver letters, containing an account of all the possessions of this magnificently endowed Benedictine abbey—the head house of the order. They date from