

## THE EZEKIEL AIRSHIP.

We have been favored by the Rev. B. Cannon of Pittsburg, Texas, a mechanical expert and the inventor of the Ezekiel airship, with a photograph and description of this latest accession to the flying machines of the world. Mr. Cannon is of the opinion that the Almighty was graciously pleased to show many novelties to Ezekiel, and in support of his contention he cites various passages of Scripture from the Book of Ezekiel, as, for example: "Then the spirit took me up and I heard behind me the voice of a great rushing, saying: 'Blessed be the glory of the Lord from his place.' I heard also the noise of the wings of the living creatures that touched one another and the noise of the wheels over against them and the noise of a great rushing."

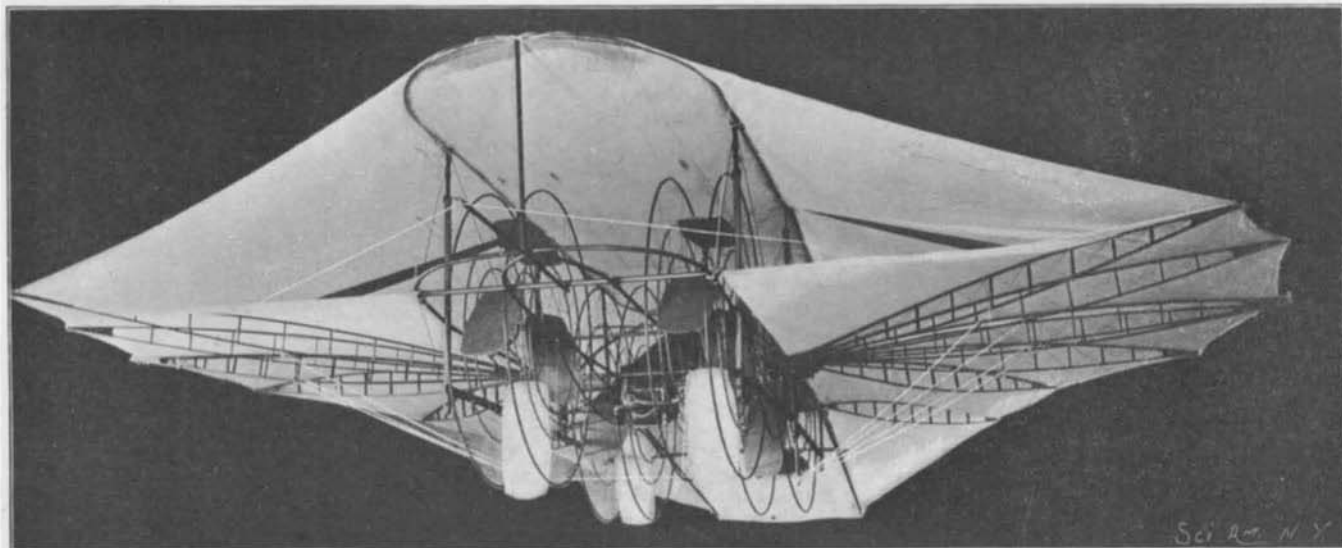
(Ezekiel iii., 12 and 13.) Other passages in the same book refer to various voyages made by the prophet, according to Mr. Cannon, in a flying machine. He considers that an airship is described in simple metaphors.

Mr. Cannon has endeavored to construct an airship according to Ezekiel's specifications. The inventor does not believe in perpetual motion, but thinks there must be cause for effect in everything, as well as a purpose in every word of the Scriptures. He also tells us there are several things described by the prophet which he does not use in the model airship which he is constructing, and very wisely, for the reason that he proposes to protect these ideas by means of patents. The inventor states that the full-sized machine is supposed to be driven by a four-cylinder 8 x 8 gas engine. The gas or compressed air is stored in the frames of the airship. The motor is connected with the ends of the main shafts direct and the speed is 400 to 1,200 revolutions per minute. As will be seen by the engraving, there are a number of wheels built according to the Ezekiel designs. When at rest the device rests upon legs, which may be raised or lowered telescopically within the outer tubing. When the vessel is to be operated, compressed air is forced into the frames of the airship. The wings are then drawn together at the side to stretch them. The extensible legs are drawn up so that the wheels rest on the ground. The air throttle is then opened and air pressure starts the motors. When the machine is first set in motion it runs along the ground upon the wheels and does not begin to rise until the propellers are rotated at considerable speed. Air pumps are then started to keep the cylinders cool. The vessel ascends on the principle of the aeroplane. In descending the internal wheels are turned back far enough to reverse the action of the blades in the wheels. The airship will then come down slowly like a parachute, and just before the ground is reached compressed air is turned into the tube in which slide the brass legs, so that when the vessel alights it has a compressed air cushion to rest upon. The inventor states that Ezekiel's plans are the first he ever worked at in which he could suggest no improvement. A company has been incorporated, with officers and full board of directors, to work out the combined ideas of Mr. Cannon and Ezekiel. The name of the company is the Ezekiel Airship Manufacturing Company, Incorporated. We wish Mr. Cannon every success in his enterprise and trust that he will succeed in rehabilitating other inventions based upon the writings of the prophet.

The Russian Ministry of Ways and Communications appointed a special commission to discuss the project brought forward by a syndicate of foreign capitalists for the purpose of installing a system of electrical towage on the Ladoga Canal. The syndicate proposes to erect works which shall not only supply the necessary energy for towing purposes and for lighting the canal, but be capable of supplying manufacturers and St. Petersburg with power.

## GREAT SLUICE GATES FOR THE NILE IRRIGATION WORKS.

In an article published in the SCIENTIFIC AMERICAN of May 4, 1901, describing the irrigation works at present nearing completion on the River Nile, we mentioned that a special description of sluice was to be employed. Through the courtesy of Messrs. Ran-

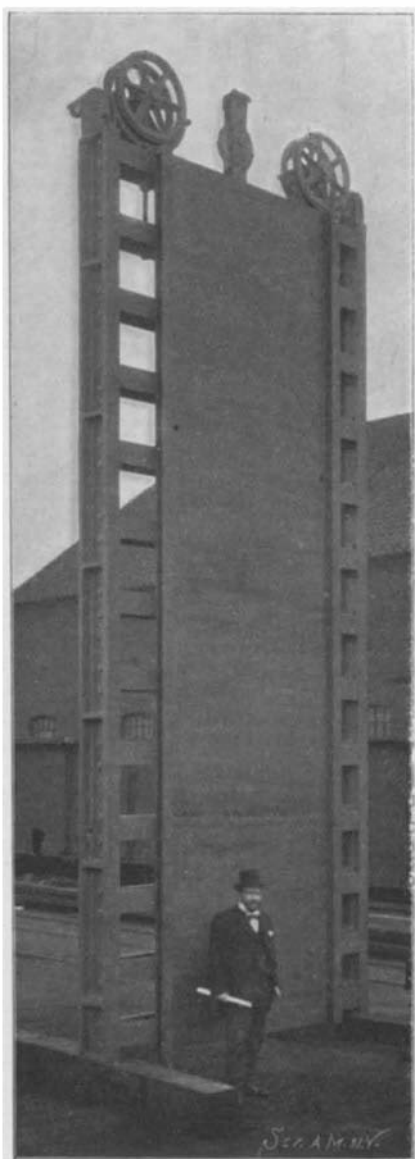


THE PROPHET EZEKIEL AIRSHIP.

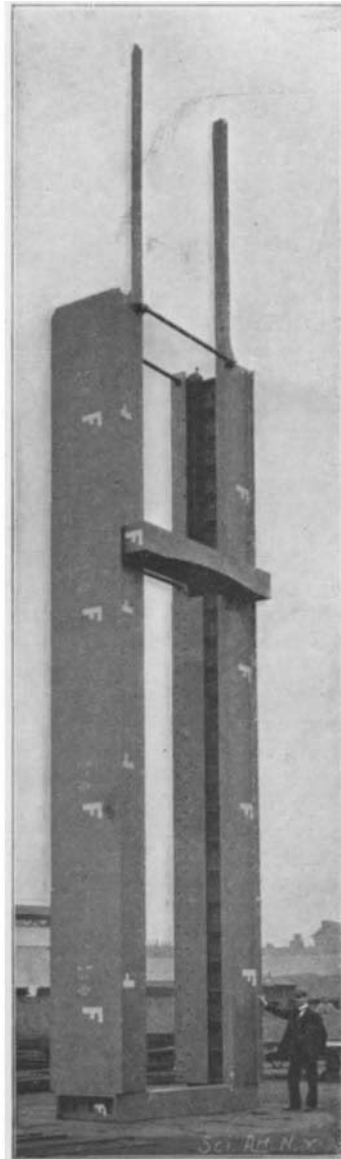
somes and Napier, engineers of London, who are carrying out this portion of the contract, we are able to publish two photographs of this device.

These sluices, which were invented by the late Mr. W. F. Stoney, are of the balanced type. They are so truly balanced that notwithstanding the enormous pressure of water that may be exerted against the gate, it can be raised or depressed with the greatest facility.

Our illustrations show respectively the frame and the sluice gate. They are the largest that have ever been constructed. There are in all 180 sluices to the dam. Sixty-five of these are placed with their sills at 87.50 meters, river-level. That is to say, there will be 87.50 meters depth of water stored behind the dam. Twenty-five will have their sills at 92 meters river-



ONE OF THE 180 SLUICE GATES FOR THE NILE DAM.



A FRAME FOR THE NILE SLUICE GATES.

level, fifty (without rollers) at 92 meters river-level—these are only to be operated at certain periods when there is very little head of water pressing against them—eighteen with their sills at 96 meters river-level; and twenty-two with the sills at 100 meters river-level.

All the sluices have openings 2 meters wide by 7

meters high, with the exception of those at 96 and 100 meters river-level, which are only 3½ meters high. The pressure against the lowest sluice is nearly 300 tons, which is all taken through live rollers, moving on planed roller paths, that is to say, one on the gate, and one on the fixed work on each side of the sluice. The sluices themselves are built of steel plates, supported by rolled-steel joists, which in turn are bolted to the cast-iron roller-path beams.

The gates are suspended by steel wire ropes. In the case of the sluices at 87.50 meters river-level the two ends of the rope are wound upon a crab barrel placed at the side of the roadway which reaches across the top of the dam. The crab gear is such that one man can operate each sluice with the full head of water against it, the sluice not being

counterbalanced in any way. Cast-iron grooves are built into the dam in order to provide the necessary space for the sluices to work in. These are cast in sections and bolted together in place. A cast-iron sill-piece and a similar lintel form the top and bottom of the sluice opening respectively. An arched roof-casting supports the masonry over the entrance to the culvert in the front of the sluice.

Owing to the cutting nature of the silt in the Nile water, it has been deemed advisable to provide stanching rods on each side of the sluice, and also in the lintel casting. These rods will render the sluice practically watertight, when shut down.

In the case of the fifty sluices at 92 meters river-level without the rollers, the sluice gate slides against the planed faces of the groove castings, and is made watertight against the faces of the groove castings and also on the sill when the sluice is completely lowered. The top is rendered watertight by an adjustable bar, bolted onto the sluice, which lowers onto a projection from the lintel, when the gate is in its final position.

When all the sluices are open the water at high Nile will pass through them with but little obstruction, and when the water is sufficiently clear the sluices will be gradually let down and the reservoir slowly filled. When it is full to the level of 106 meters river-level, the necessary flow will take place through the sluices at 96 and 100 meters river-level. As the reservoir is emptied the lower sluices at 92 meters river-level, with rollers, and those at 87.50 meters river-level, will also be opened to allow the necessary discharge.

There are five lock-gates in connection with the scheme, all of which are the full width of the lock—9½ meters. The height of each of these gates is 8 meters, 11 meters, 14 meters, and 18 meters respectively, the two upper gates being 18 meters high.

Each gate is hung from a carriage and is arranged to roll back on live rollers into a recess in the masonry, and the live rollers are supported upon bascule girders, which are counterweighted and arranged to lift up, when the gate is rolled back into the recess, so as to offer no impediment to the masts of the vessels passing through. Each gate has twelve sluice openings in it near the bottom, and also four vertical openings actually at the bottom, in order to produce a scour along the lock to remove the silt deposit.

All the operations in connection with the working of the gates and valves are controlled by hydraulic power. A small turbine arranged in the dam will drive hydraulic pumps to serve the hydraulic system for the lock gates.

Lieut. E. P. Bertholf, who was sent to Siberia last winter by the government to secure reindeer for the Alaskan station, arrived at Port Clarence August 28 with 254 of the animals. He secured the reindeer 100 miles north of Irkutsk, the present terminal of the Siberian railway. The last consignment brings up the total of the government reindeer to 3,912.