FALL OF AN ELEVATOR AT THE TRACT SOCIETY BUILDING, NEW YORK.

The Tract Society building, New York, was recently the scene of a painful accident, in which one of the elevators fell from the upper stories to the bottom of the shaft, killing the engineer and the elevator boy. The accident occurred late in the evening, and, fortunately, when the rush of the day's business was over. The fact that the collapse happened in a modern and first-class city building, and that the apparatus which failed was put in by two of the leading and most successful makers of elevator machinery, gives special interest to the investigation which is now being made, the results of which will be given in a later issue. Briefly stated, the facts of the accident are as follows:

For some reason, not yet ascertained, the safety clutches, which prevent the too rapid ascent or descent of the car, were thrown in when the car was at the first or second floor, locking it fast. The engineer was sent for, and after he had released the clutch, he ascended with the elevator boy. The car was seen to pass the seventeenth floor, and shortly after it broke loose and fell the whole depth of the shaft. An investigation of the wreckage showed that the car had evidently struck the overhead framing of the elevator shaft; that the eight half inch hoisting cables had been broken off abruptly at the same point, and that the safety clutches had failed to grip the vertical guide bars which extend down each side of the shaft.

The two questions which are being asked are, first: What caused the breaking of the eight hoisting cables, any one of which could ordinarily have held the weight of the car? and, second, Why did the safety clutches fail to act?

In answer to the second question, it is stated that, on examining the wreckage, it was found that a bar, which the engineer had used to unscrew the capstan head, which releases the clutches, had been left in place and had jammed the apparatus so that it could not be closed.

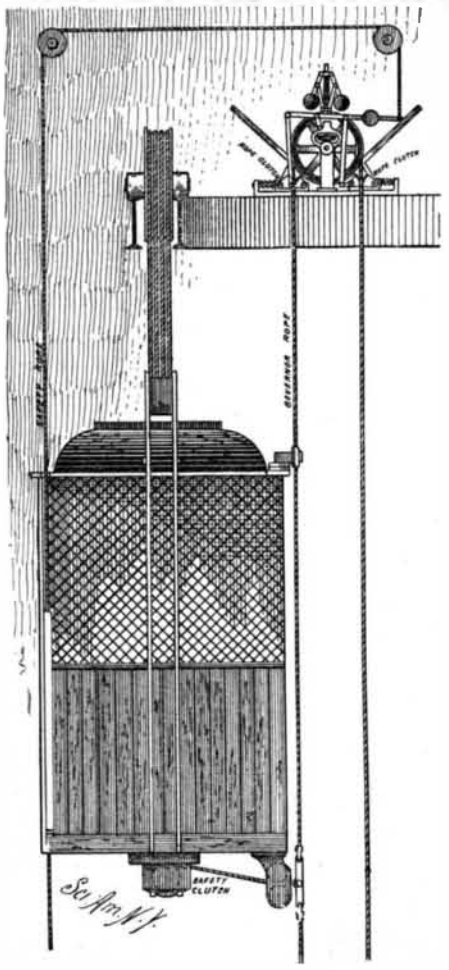
The safety clutches are of the well-known type made by the Otis Elevator Company. They are operated by a centrifugal governor, which is attached to the beams at the top of the elevator shaft. The governor is driven by an endless wire rope, which passes over the governor sheave at the top of the shaft and under another sheave at the bottom of the shaft. One end of a short length of rope is attached to this rope at the level of the bottom of the car, and passes under the car to a drum on the clutch mechanism. The governor rope is thus made to travel at the same speed as the car. The governor is set for a certain speed, and if the car exceeds this speed, the governor will rise, and, by means of connecting levers, will close a pair of eccentric clutches, which instantly grip the governor rope and hold it stationary. The car being in motion and the rope stationary, the short connecting splice which runs to the clutch drum beneath the car is unwound, causing the drum to rotate. Two threaded horizontal bars pass axially into the ends of the drum, one having a right and the other a left hand thread. The unwinding forces these bars out to the sides of the car, where they are connected by toggle joints with powerful nippers or pincers, which take hold of the steel guides on each side of the car with an extremely powerful grip. Even when the guides are freely greased, if a car weighing six thousand pounds is cut loose—as was recently done in experimental tests at the works of the Otis Company—it will be almost instantly arrested. In addition to the automatic arrangement, there is also a hand rope by which the elevator boy can set the clutches independently. To enable the car to be released after the clutch has been thrown in, a capstan collar is provided on the drum shaft. This can be reached by raising a trap door in the floor of the car. On the present occasion it is supposed that the engineer used a short bar as a lever to turn over the capstan, and that, after winding up the drum sufficiently to release the clutches, he left the bar in the capstan. If so, it was this that cost him his life, for when the car fell, although the governor closed the eccentric clutches and the rope pulled the drum around as far as it would go, the latter was prevented by the bar from turning sufficiently to close the grips. It is said that the bar was found jammed over tightly against the edge of the trap door in a way that showed what a powerful pull the governor rope had exerted.

It is considered that, had the engineer withdrawn the bar, the car would never have fallen. At the same time the occurrence should be received by the company as a valuable suggestion to rearrange the releasing mechanism so that even in unskilled hands a recurrence of this form of accident will not be possible.

To determine the cause of the failure in the elevator mechanism is more difficult. Like the safety clutches, the plant, which is of the hydraulic type, is of a well tried and approved pattern and was put in byone of the best known makers in the country. Hydraulic elevators may be divided into five distinct groups, the system under discussion belonging to the fifth class:

1. Hydraulic systems which take their pressure direct from the street water mains.
2. Those which derive their pressure from an open gravity tank or the roof.
3. Those which use a closed roof tank, where the pressure is due to the hydraulic head, plus the pressure of the pumps.
4. Those which use a pressure tank on or near the level of the bottom of the elevator machines.
5. Those which obtain their pressure from direct connected steam cylinders or from weighted accumulators.

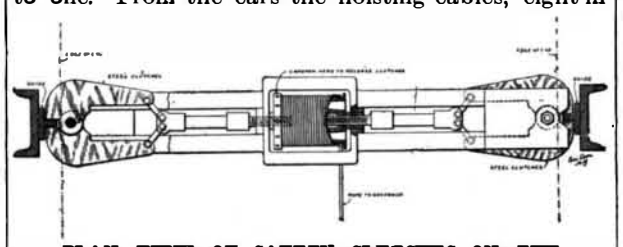
The above distinctions relate to the methods of furnishing the needed head or pressure. The elevator machines proper may be of the horizontal or vertical type and are of either the "piston" or "plunger" variety, the former consisting of pistons working in bored cylinders and the latter of plungers or rams working through stuffing boxes in cylinders that may or may not be bored to fit the plunger.



TRACT SOCIETY ELEVATOR, SHOWING GOVERNOR AND ROPES.

The elevators in the American Tract Society building are of the plunger type and pressure is maintained upon the elevators and the pumps are controlled by weighted accumulators. For the regular service of the elevators the water is supplied by a Crane high-duty, cross-compound, crank pump. There is also provided as a relay to the main pumps a powerful duplex pump, and there is also a smaller duplex pump for night and Sunday service. The main pumps deliver water against an accumulator pressure of 250 pounds to the square inch, and the pumps are automatically governed by the rise and fall of the accumulator.

The plunger cylinders extend half way up the shafts, the plunger being geared to the cars in the ratio of two to one. From the cars the hoisting cables, eight in number, pass over a sheave at the top of the shaft, then down below a sheave at the head of the plunger and are finally carried up and fastened to the overhead beams. The car is drawn up by the pull of the dead weight of the plunger. When an ascent is to be made the discharge valve is opened, releasing the water from the cylinder and allowing the plunger to descend. To lower the car, water is admitted to the cylinder, so as to raise the plunger. The shipper rope leads from the car to a pilot valve, which in turn acts upon the main valve, its action being similar to the floating lever in common use in steam engineering. This guards against a too sudden admission or exit of the water; for, however suddenly the shipper may be pulled, the main valves will only open by degrees, thus insuring a gradual starting or stopping of the car. The water, under the accumulator pressure, enters the cylinder through a check valve, whose office is, in case of the bursting of any part of the pipe system, to maintain the water in the cylinders and hold the cars stationary at the point at which the accident occurred. Such in brief is the hydraulic system as carried out at this building. The safety appliances are worked out on the well known lines adopted by the Crane Company, and the fact that they have hitherto given good satisfaction all over the country makes the present deplorable accident the more puzzling, and will lend special interest to the pending inquiry.



PLAN VIEW OF SAFETY CLUTCHES ON THE ELEVATOR CAR.

The Wellman Polar Expedition.

It was recently announced in the New York Herald that Mr. Walter Wellman was to be the leader of an expedition into the polar region. Three years ago Mr. Wellman was the head of an expedition which penetrated far into the ice at the north of Spitzbergen. The new expedition will start north some time next June, taking the Franz Josef Land route. Mr. Wellman has just returned from Europe, and held a long conference with Nansen concerning his plan, which Nansen approved with warm terms. Mr. Wellman says:

"My plan is very simple. We shall establish a supply station at Cape Flora, which has just been abandoned by Jackson, the English explorer, who returned without going as far north as Nansen did. Next autumn we expect to throw out a second supply station, two or perhaps three degrees further north, or within seven or eight degrees of the pole. There we shall winter. The following spring, as soon as there is light enough to travel by, we shall set out with six men, sixty or seventy dogs and sledges, determined to make the best possible use of the favorable season. The favorable season for work in that region is while the cold is still great, say at temperatures from sixty to fifteen below zero. Then the surface is hard and sledging at its best. In June the power of the summer sun produces slush and renders travel difficult, if not quite impossible.

"Therefore, we shall have from one hundred to one hundred and ten days in which to make our effort. Actually, all attempts to reach the north pole nowadays are dashes. Dr. Nansen made his dash from the Fram. Lieutenant Peary proposes to make a dash from the north of Greenland.

"Dr. Nansen believes, if he had had a base of supplies to fall back upon and a large number of dogs, he coule have reached the pole. He says it can be done in the way I propose, and I am naturally eager to have a try at it, and, if possible, to plant the American flag at the spot where there is no other direction than south.

"I am well aware that many persons think nothing practical is to be gained by reaching the pole. It chances that I am an enthusiast in this field, and I ask neither public subscriptions nor universal consent. My party will be a mixed one as to nationalities, with a few American scientific men and the others Norwegians."

Possibilities of Trade with Central Africa.

We are in receipt of a letter from Mr. J. H. Camp, of Lima, Ohio, bearing upon the question of the development of our trade with Central Africa. Mr. Camp speaks with authority, having spent seven years at Congo, and he states that the inhabitants of Central Africa are always ready to pay high prices for manufactured goods, provided they can be sure of obtaining a really durable article. At present there is a great demand for all classes of building material and household goods. There is a demand for all classes of textile goods, from calicoes to heavy blankets, and the superior class of tools made in the United States, including carpenter's tools and American axes, would sell readily among a people who are endeavoring to climb to the level of civilization. In exchange we would receive ivory, gold, precious stones, fine timbers, rubber, etc.

In conclusion our correspondent writes: "I may say that, after a thorough search over that great and rich equatorial country, I find that we are the only country of any great importance which has not taken steps toward permanent representation there. A set of consuls, properly located, would bring millions of dollars annually to our manufacturers, and keep thousands of idle operatives busy. I trust that before long our national association of manufacturers may be able to aid in opening this great and new country to our commerce, and I am sure that our people would be greatly surprised at the results which would speedily follow."

DR. H. B. GUPPY, English scientist, has just returned to Napoope, Hawaii, after spending twenty-three days alone on the summit of Mauna Loa, the famous volcanic mountain, at an elevation of 13,000 feet above the sea level. During this time he lived principally on rice, bread and coffee. He used melted snow to furnish the water. Dr. Guppy lost considerable weight, but is none the worse for his trip. He made many explorations on the crater, in addition to collecting such flora and fauna as could be found upon it. The crater was found to be seven miles in circumference. It was generally filled with steam during the doctor's stay on the mountain. One day a section of rock measuring 300 by 1,200 feet slipped into the crater, and the landslide continued for seven hours.