PROPOSED FIRE ENGINE ELEVATORS FOR USE IN THE NEW YORK ENGINE HOUSES.

For some years the necessity of increasing the number of engines that could be called upon for the extinction of fires has been realized forcibly by the Fire Department of this city. Their power of doing this has been restricted by unfavorable conditions. The districts where increased force is most needed are crowded with houses, and property is held at a very high valuation. For each engine company a building 25 feet in front and of full depth is required. The department has not felt able to purchase new lots enough to carry out their desires.

Some years ago Mr. Henry D. Purroy, now president of the board, conceived the idea that by utilizing the cellars of engine houses the capacity of each might be doubled. At present the cellars represent little more than waste space. They contain a small heating apparatus, and the great part of their area, equal to that of the working floor, is useless. He proposed to introduce elevators that should be sufficiently powerful to raise and lower an engine or tender, or other apparatus, from floor to floor. If this idea were successfully carried out, there would be ample room for a second relay of men and horses on the upper floors, the extra apparatus would be stored in the cellar, and the working floor would be as unobstructed as it now is.

In the illustration we present Commissioner Purroy's idea in some detail. Sections of the cellar and working floor are made movable, and are connected by heavy stanchions, so as to preserve an invariable distance from each other. When the lower platform, sinking into a depression in the cellar floor, comes to a level therewith, the upper platform is flush with the working floor. Four guide posts run from cellar floor to the ceiling of the ground story. Upon the lower platform an extra engine or tender is placed. After the regular engine has been called out, the platforms are raised until the lower one is even with the working floor. By any simple locking device which may be automatic, the platform is caught and secured in this position. The second apparatus is then ready to answer a second alarm. Our illustration shows the elevator rising as the regular engine is leaving for a fire.

By counterpoising, the weight to be raised may be almost nothing. An engine represents some 10,000 lb. While this seems a large weight, it is an invariable one, and the elevator may be counterpoised within a few pounds of its load, and might even be overbalanced, so that the platform, on a catch being released, would rise automatically. For such lifting power as may be required, it was thought that a gas engine might be used.

The length of the stanchions should be so adjusted that the upper platform would strike the ceiling above or striking pieces attached thereto, and lock itself there as the lower one came to its place. This feature was included in the original idea, and appears a very good one.

With regard to the location of the elevator, it may be in the front or rear. If in the front, then its upper platform would alwayscarry the regular engine. If in the rear, the upper platform would be unoccupied, and would count as floor space. As the lower engine rose, it could be run forward by man power or the horses could be harnessed as it stood.

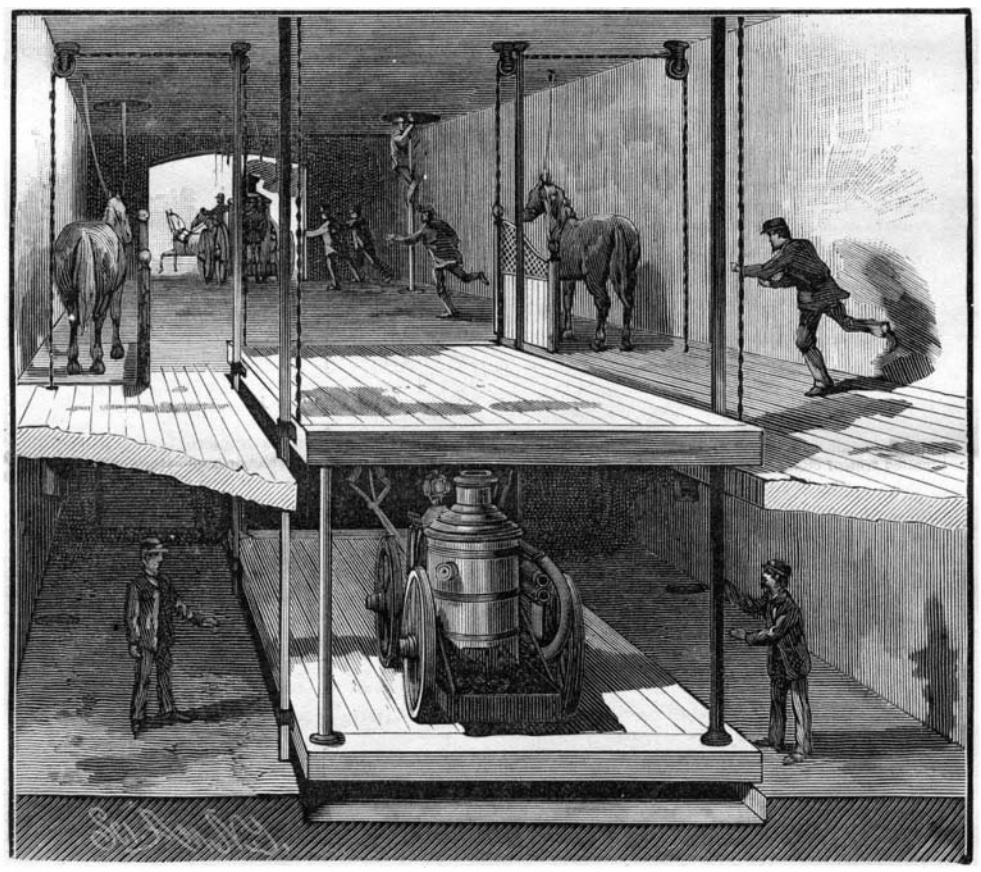
By having it of sufficient length, the extra engine could be carried up with its pole in place and the harness hanging from the snap hooks on the lower surface of the upper platform. On the other hand, as it takes but a moment to place the pole in its socket, the smaller elevator may be adopted.

The widest range for application of power and other details is still open. A direct or indirect hydraulic lift may be employed, or a windlass worked by some form of power would answer. The lower engine need not be kept upon the platform, but may be stored in front or rear of it, and be run on when the upper one goes out. To guide it between the stanchions and guide posts, Commissioner Purroy has proposed the use of rails on the platform, similar to those used on street railways.

The double platform elevator counterpoised is substantially the original idea, and presents, to our mind, very great advantages. Plans have been prepared by Messrs. N. Le Brun & Son, architects to the department, which involve the use of a single platform elevator, worked by hydraulic power. When the first engine has gone out, the elevator, whose platform has hitherto formed part of the working floor, is lowered to the cellar, receives its engine or other apparatus, and rises with it to the upper level. Such elevator may be worked by a short cylinder directly under it or by an indirect acting cylinder, such as is in use on most elevators.

For cities of a more regular shape than New York, this plan can be worked to even greater advantage. Three or four houses can be made to cover a large area if worked upon this plan. While it seems a peculiar merit of the method that it can be applied to old houses, the department, not wishing to risk a failure, have preferred to wait until a new house was to be built to test its merits. This is now soon to be done, and it promises to offer a satisfactory solution of a very troublesome problem.

The double platform elevator presents the advantage that the floor is always complete save as the lower engine is coming up. On the other hand, the single platform arrangement does away with the obstructing stanchions and guide posts. Each system, in other words, has its own advantages.



FIRE ENGINE ELEVATOR.

PHOTOGRAPHIC NOTES.

Improving Gelatine Emulsions.—Before the first annual Convention of Photographers of Great Britain, recently held at Derby, Mr. A. L. Henderson, well known for his exhaustive experiments in gelatine emulsions, spoke upon the advances which are being made in this direction. By means of the centrifugal machine he had, with one or two exceptions, remedied every spoiled emulsion that had been brought to him, and in those cases he believed the emulsions had been fogged by light.

He regrets that photographers, as a general rule, are so reticent and uncommunicative about any improvements they may discover. If there were fewer so-called trade secrets, photography, as an art science, would make much more rapid strides. He says:

Through this new departure, *i. e.*, using a centrifugal separator, I have gained more knowledge in six months than the whole previous year's experiments. By the complete removal of the colloid matter and soluble salts, I am enabled to examine the finely divided bromide, and then add other substances that I venture to think will still more revolutionize photography. I particularly allude to the addition of what may be called accelerators (physical or chemical) to emulsion. If an emulsion, being perfectly free from soluble matter, is boiled for a time, it will darken in color. The same emulsion might have been boiled as long in the presence of free bromide and nitrates without darkening. If in the former case I add some nitrate that will dissolve oxide of siver, and add some free bromide, I decolorize the emulsion, but I will not altogether eliminate fog, for this reason: the free silver (*i. e.*, I will call it free silver for argument's sake) has acted on the colloid before the addition of the free bromide, which has to play the part of reconversion, but, as I have previously stated, if both the nitrates and free bromide is present from the first, no chemical fog will result.

Some few years ago, Professor Stebbing published "that a washed bromide of silver coarsely precipitated, when boiled with the addition of free bromide, a breaking up of the granules took place." I tried this at the time without noticing this effect, but on my adding some gelatine a rapid breaking was the result, and I found that this occurred without the free bromide. It is very evident that the addition of fresh gelatine to a finished emulsion will frequently accelerate and sometimes slow it. Accelerate if the gelatine is neutral, and restrain or slow if it is acid. I have discovered that a finished emulsion may be ripened considerably by keeping it liquid, with the addition of a very small quantity of pure nitrate of potassium and bromide of potassium. My reason for suggesting potassium salts is that they are less deliquescent, and no harm will come over the plates prepared without the removal of the salts. The quantity must not be so large as to give any appearance of crystallization when the plates are dry. The larger the quantity, the finer is the emulsion in density, speed, and clearness of shadows. I generally add to every ounce of gelatine five grains of potassium nitrate and two of bromide. Here are two plates. You will see the effect; not only does the speed increase, but, strange to say, the density also. Both these plates have had the same exposure under the sensitometer tablet. I calculate the speed has been increased nearly four times. I am not quite sure if my explanation is correct, but it looks as if the very partial crystallization allows more light to penetrate the film and perhaps absorb certain rays less actinic. I think this idea will open a wide field of research, namely, that crystalline matter introduced in emulsion may take the place of the various substances recommended to give orthochromatic or isochromatic effects.

Here is another curious result occasioned by the mixture of a very rapid and a slower emulsion. You will see that the plate is covered with black spots. At first I thought that some impurity had got into the emulsion, but on close examination it will be seen that where there is no exposure, the black spots do not exist, showing that the black spots are silver compounds. The addition of nitrate of potassium and bromide caused a breaking up and possibly dissolving of the more sensitive particles (these particles are so fine that they have passed through a chamois leather filter). This will explain why an emulsion is more homogeneous and better for being set and remelted. I called attention to the fact some years ago that setting and remelting several times improved the quality of emulsion, although at the time I was not sure of the reason. I see that Mr. Plener has given it as his opinion that a putrid emulsion that frilled could not be cured by the removal of the decomposed gelatine. I differ with Mr. Plener in this matter. Mr. Plener, doubtless, made this statement, believing that frilling was produced only from decomposed gelatine. The most common cause of frilling is the subsidence of the silver bromide to the glass from slow setting. An emulsion that has become sloppy is usually coarser. I believe that Mr. Plener is, to a certain extent, correct regarding the re-emulsifying of the bromide after being passed through the separator. The addition of acids to the bromide of silver will remove all the gelatine, and, in fact, will permit the bromide to be washed in alcohol, and added to vehicles other than gelatine. If the gelatine is not perfectly removed, the granules of silver bromide will harden under the alcoholic treatment, and be useless for mixing with collodion; but they soften in water again, and are easily miscible in gelatine.

One word more regarding the keeping qualities of emulsion containing nitrates and bromide. The antiseptic properties of nitrate of potassium are well known to picklers of meat. I have some emulsion put away to test the keeping qualities. I am in hopes that at the next convention I may be able to show this emulsion, and tell you something more of its properties.

We have taken the foregoing extracts from the *British Journal of Photography.*

American Institute Fair, New York.

The 55th annual fair of the American Institute will be opened in the city of New York on the 29th of September, 1886. The building is now being put in order. The fountain in the center of the main building will be in operation this year, and will be illuminated by Edison electrical lights. There will be an unusual display of fine engines and labor-saving machinery of all kinds. The horticultural display will commence on the 6th of October.

RECENT determinations give light a velocity of 185,420 miles per second (Cornu), or 186,380 miles per second (Michelson).