

NEW BOX FASTENER.

The device shown in the engraving is designed for fastening lids on boxes without the use of screws or nails, and in such a way that the lid can be readily fastened or removed.

The lid fastening consists of a pivoted bail at one end of the box, to which springs are attached. These springs pass through staples on the end of the box, and press the bail over the end of the lid. The latter is provided with a series of tongues fitting into recesses and between tongues on the upper edge of the end of the box, the end of the box being provided on its upper edge with a spring, which presses upward and holds the lid up against the pivoted bail to prevent the bail from becoming loose.

To fasten the lid on the box, one end of the lid is passed under the fixed strap or band, and the bail on the opposite end is pulled outward, and the tongues at the end of the lid are pressed into the recesses in the upper edge of the end of the box. Then the bail is pushed back again over the tongues. The bail and the straps pass into recesses in the end, sides, and lid of the box, so that their surfaces will be flush with the surfaces of the box. Stamps of muslin or paper are secured on the lid and box to indicate whether the lid has been tampered with or not. This useful invention has been patented by Mr. William J. Baker, of Denver, Col.

Changes in Cruls' Comet.

Spectroscopic observations of the great comet, made by Commander Sampson, at the Naval Observatory, Washington, October 15 and 16, showed the spectrum to consist of three bands. The brightest band was in the middle of the green, nearly corresponding to the "B" lines; the second was in the orange yellow; the third, at the middle of the blue. The middle band was very bright, and sharply defined on the least refrangible side. The other two bands were of about equal brightness, but were much fainter than the middle band. Like it, their brightest portions were near the least refrangible side. No band sharply defined on both sides could be made out.

This spectrum is quite unlike the one observed when the comet was nearer the sun: a spectrum bright and continuous, with many bright bands, among which the sodium bands were particularly prominent. In the spectrum of October 15 and 16 there was no trace of the sodium band.

It was found that when the brighter portions of the bands were removed as far as possible from the field of view, the fainter portions were seen to extend themselves into an almost continuous spectrum. When the tail of the comet near the nucleus was examined, it was found to consist of a faint continuous spectrum, without any bright bands. The explanation of this great change in the spectrum is that when the comet was first examined just after it had passed the sun, the continuous spectrum was due to reflected light, while the bright bands were due to the incandescent vapor formed by the intense heat of the sun. The comet has now so changed its position with regard to the sun that the amount of reflected light has greatly diminished, and the comet itself has greatly cooled after its hot bath in the atmosphere of the sun. The beautiful silvery appearance of the comet is attributed to the preponderance of green light which it emits, as shown by its spectrum.

To account for the apparent separation of the nucleus of the comet into three or more parts on several days with subsequent consolidations, the hypothesis has been advanced that the nucleus is not a single body, but is made up of a cluster of independent parts with a motion among themselves. The discovery by Dr. Schmidt, at Athens, October 8, of a small comet near the great comet, and pursuing the same general course, tends somewhat to confirm the hypothesis of a broken or "cluster" nucleus.

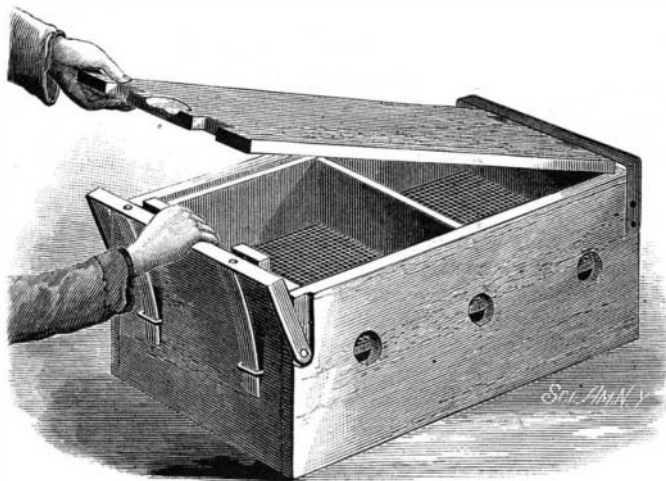
A Medical Case for Railways.

The Pennsylvania Railroad Company has had prepared for carriage on each locomotive of the company, a box of appliances to be used in case of accidents. The box contains: one rubber compress, one package of absorbent cotton, six rolls of bandages, and one pyramid of pins. A label on the box tells how the outfit is to be used, and directs that it must always be kept up by immediate requisition for any article needed. This outfit is obviously intended mainly to meet necessities arising from accidents to trainmen in the ordinary course of events; yet it might prove very serviceable to injured passengers in case of large disasters.

The promising discoveries of coal in Iowa have been followed by not less promising discoveries of iron ore.

AN ENGLISH FOURTEEN-STORY HOUSE.

During a recent stay in London, says the editor of *La Nature*, we had an opportunity of observing the curious structure shown in the accompanying cut. The building is an apartment house, which, counting the floors beneath the level of the street, and the attics, numbers fourteen stories. Besides these, there are two subcellars. This house is located in a new quarter near the Westminster Abbey. On approaching it, the beholder is filled with astonishment at the aspect of a so truly monumental mass, whose total height is about one hundred and thirty feet. The number of windows in the structure, inclusive of those looking out upon the vast courts within, exceeds five hundred. The tenants of the house and their visitors reach its different



BAKER'S BOX FASTENER.

stories by means of a hydraulic elevator, which takes about two minutes to reach the thirteenth story. After reaching the latter a marvelous panorama may be observed if the weather is clear. But, as well known, fogs are frequent in London, and it often happens that the tenants of the upper floors are immersed in clouds, after the manner of aeronauts.

There is at Genoa an eleven-story house, and there have been in former times some constructed at Paris of seven and nine stories; and, in the United States, numerous experiments have been made with similar structures, these becoming practicable with the use of elevators.

The City of London has long had the reputation of having houses only of from two to three stories; but the example here brought to notice shows what can be done by English architects, who, it appears, are not restrained, as they would be, at Paris, by administrative regulations.

Natural Gas for Pittsburg, Pa.

The Philadelphia *Press* reports that a corporation has leased a large gas well at Murrysville, eighteen miles from Pittsburg, with the intention of piping the natural gas to that city for industrial and illuminating purposes. The



AN ENGLISH FOURTEEN-STORY HOUSE.

projectors profess to be confident that they will be able to supply gas enough to Pittsburg to meet all requirements for heating and lighting.

At a meeting of the New York Microscopical Society, Oct. 10, Dr. William B. Carpenter, of London, summarized his investigations of the structure of *Eozoon Canadense*, and exhibited many specimens under the microscope. Dr. Carpenter holds to the theory of the organic origin of this much disputed fossil.

New Method of Printing Photographs in Colors.

The Hoeschotype is the invention of Herr F. C. Hoesch, of Nuremberg, who has spent the last three years in bringing his process to perfection. The method by which Herr Hoesch works is at once simple and rapid. A photograph is first taken of the picture. From the negative six gelatine prints on glass are made, and a color plan having been made on one, on each of the other five a separate color scheme is worked out corresponding to the particular tint desired, all the portions not required being painted out. The colors used are the three primaries, a neutral gray, and a brown, and with these five tints any combination can be produced. The gelatine is made insoluble with bichromate of potash, and thus can be printed from in an ordinary lithographic press. The advantage which Herr Hoesch claims is that where a chromo lithograph of an extended scale of tints may require from a dozen to twenty printings, the Hoeschotype may be produced in five printings. The various stages of the color printing by which the finished print is built up are exceedingly interesting. The print we examined was the portrait of a girl. Plate No. 1 showed only the yellow tint graduating from the deep points of color in the hat to the light tints in the hair. The outline of the features was only just discernible, while the cheeks were left white. In the next printing the color was red. Here, where necessary, the red mingled with the yellow, producing orange. No. 3 was blue, and the greens and purples made their appearance in their proper places. No. 4 was a neutral tint of gray, which toned down the crudeness of the three primaries. Finally came the brown, which gave a mellowness and warmth to the shadows, and completed the picture. For the result we have nothing but praise; and if examples like the ones we saw at Messrs. Gladwell's can be produced rapidly and at a

small cost, chromo-lithography will be almost superseded. It is evident that some artistic skill in manipulating the gelatine plate is absolutely necessary, for herein lies the power of being able to produce graduated tints at one working; but whether the gelatine is worked upon before or after being bichromatized we are unable to say. So far as the artistic element is concerned, we understand that Herr Hoesch is certain that any South Kensington student of average skill could, with three months' practice, acquire proficiency. If this be so, there is no insuperable difficulty for the artist. We believe that no attempt has been made in connection with enlargements of portraits from life, but we saw several Hoeschotypes of vases from the objects themselves, which left nothing to be desired. Of course it is not necessary to use five tints in every case, and in the reproductions of the vases three only were employed. To insure absolute accuracy in the matching of tints, the inventor has prepared a scale in which every combination of the five colors in certain proportions is shown. Herr Hoesch divides his five colors into fifths, and having thus twenty-five portions to ring the changes upon, he gets 1,600 tints, each of which has a number attached to it which shows on reference to a table that it is composed of so many fifths of one color, and so many fifths of another, as the case may be. The equality of the prints may therefore be depended upon. So far as we could see from the results shown by Messrs. Gladwell, there is hope that the Hoeschotype may take its place before long as one of the recognized art processes of the day.—*Photo. News.*

Gunpowder Engine.

A powder engine has been patented in Germany by Herr Beck. In it a piston is forced to and fro in a horizontal cylinder by small quantities of powder ignited on either side alternately. Powder pans are provided on the bottom within, on which, at the proper moment, powder falls through passages from two holders which rest on distribution slides. The igniting of the powder is effected by means of a spirit or gas flame from the cylinder cover, drawn in through an oblique aperture by the suction force of the piston. The access is regulated by slides. The gases of explosion are expelled through holes furnished with slides, on return of the piston. The heavy residues are pushed by the piston into bags, which are emptied at intervals. It is claimed for the new motor that, with small occupied space, it is very effective and easily set at work. The consumption of powder is comparatively small, and the engine regulates itself. The danger is represented as slight.

St. Louis is to be supplied with water gas for fuel purposes. The laying of pipes is progressing rapidly.