whereby they were carried onward with but little exertion on the part of themselves. But this was soon disproved. They sallied forth at right angles from the train, flew to a distance of thirty or forty feet, still keeping pace, and then returned with increased speed and buoyancy to the window.

To account for this, look at the wings of a fly. Each is composed of an upper and lower membrane, between which the blood vessels and respiratory organs ramify so as to form a delicate network for the extended wings. These are used with great quickness, and probably 600 strokes are made per second. This would carry the fly about twenty-five feet, but a sevenfold velocity can easily be attained, making 125 feet per second, so that under certain circumstances it can outstrip a race horse. If a small insect like a fly can outstrip a race horse, an insect as large as a horse would travel very much faster than a cannon ball.

THE INTERIOR OF THE EARTH.

One of the most interesting questions relating to our planet, says Professor G. P. Serviss, is that of its interior constitution. Observations made in deep mines and borings indicate that the temperature increases as we go downward at the average rate of 1° Fahr. for every 55 feet of descent, so that, if this rate of increase continued, the temperature at the depth of a mile would be more than 100° higher than at the surface, and at the depth of 40 miles would be so high that everything, including the metals, would be in a fluid condition. This view of the condition of the earth's interior has been adopted by many, who hold that the crust of the earth on which we dwell is like a shell surrounding the molten interior. But calculations based upon the tidal effects that the attraction of the sun and moon would have upon a globe with a liquid interior have led Sir William Thomson and others to assert that such a condition is impossible, and that the interior of the earth must be solid and exceedingly rigid to its very centre. To the objections that the phenomena of volcanoes contradicted the assumption of a solid interior, it is replied that unquestionably the heat is very great deep beneath the surface, and that reservoirs of molten rock exist under volcanic districts, but that taking the earth's interior as a whole, the pressure is so great that the tendency to liquefaction caused by the heat is overbalanced thereby. The whole question, however, is yet an open one, as the *Indian Engineer* wisely observes.

MAKING GLASS FOR MOSAIC WINDOWS.

The glass-worker has only begun his work when he has the molten "metal" simmering in his crucibles. It must undergo many subsequent manipulations before it is available for the purpose of art. Some of these, from a technical point of view, seem retrogressional. It has been found that the rich color effects in glass of the middle ages are largely due to imperfections in the material. Its lack of homogeneousness, its unequal thickness, and uneven surfaces contribute largely to its beauty. The modern product is too uniform to be brilliant; it transmits the light with too great regularity. Intentional imperfections are, therefore, introduced into the process, and the products, in consequence, are much more satisfactory to the artist. This work of individualizing the product has now been so far systematized that several special brands of art glass are recognized in the markets. The so-called antique glass in both white and colors, is made precisely like the ordinary sheet window glass, except that the surface of the glass is made full of minute blow-holes, which produce almost an aventurine effect, and add greatly to its brilliancy. In the cathedral glass the surface is rendered wavy and uneven, so that the transmission of light shall be correspondingly irregular. In the flash glass ordinary sheets are covered with a thin plating of colored glass, a process which permits a very delicate color tone, and materially decreases the expense, where a costly glass, such as ruby, is needed to give the color. In mosaic work it is now generally preferred that the glass shall not be at all transparent, since the effect is much richer. Most of the glass is therefore cast—as rough plate is cast.

THE EMPLOYES' TIME REGISTER.

The accompanying illustrations relate to an excellent system of recording and registering the time, attendance, or performance of employés, which is being introduced by the Automatic Time Stamp & Register Company, of 71 Sudbury street, Boston. It is extremely simple in plan and execution, and so completely answers the requirements of its intended service that its adoption in manufacturing and other establishments where the arrival and departure, or performance, of employés is a matter of importance to be noted and registered with infallible accuracy, cannot fail to prove advantageous. The system and its operation will be understood from the following description:

It comprises a card-delivering device which must be used in conjunction with a second device which is adapted to receive the cards, and which is provided with suitable mechanism wherewith to print upon them the exact time—year, month, day, hour and minute of their reception. Fig. 1 is a view of the first device, which consists of a locked box of thin metal, mounted on a wooden base. In this the cards —numbered consecutively, and weighted so as to hold them securely—are placed. At the bottom of this box, in front, is a slit just large enough to allow one card to be delivered at a time; and directly opposite is an opening through which a thin blade of metal may be introduced, which, by forcing against the bottom, and whenever the box is pushed inward, shoves the card forward through the slit and into the hand of the operator.

The second portion of the mechanism consists of the card-receiving and printing device. It is shown herewith in Fig. 3. It is formed of an iron case, hinged at the back, and at the top is provided with a slot for receiving the cards. The front of the case is also hinged, and in its upper part is fixed a circular piece of glass. In this box is contained an automatic