# A Wizard of Modern Industry

## Recent Developments of the Electric Eye

HOW the photo-electric cell may bring about an estimated saving of millions of dollars annually in the steel industry was demonstrated recently in New York by J. V. Breisky, research engineer of the Westinghouse Electric Company. An accurate automatic process is to be substituted for human eyesight and judgment in determining temperatures of steel in the various processes of manufacture. No previous mechanical device has been quick enough to give the essential instantaneous record of the temperature of metal, in the blast furnace, the tube mill, or rolling mill. Tremendous losses thus occurred when the temperature was estimated too high, too low, or too inconsistently.

To illustrate this new use of the "electric eye," Mr. Breisky made a demonstration of its precision in measuring temperatures. On the lecturer's table was a photo-electric cell unit, an electric heater, and a meter calibrated in degrees temperature. A varying current was made to pass through the heater, the temperature in the heating element thus being made to rise and fall. The slightest change—hardly noticeable to the human eye—caused an instantaneous variation in the reading of the meter. In all the processes of steel manufacture, where accurate control of temperature is essential, and where human eyesight finds it difficult to judge, the electric eye readily indicates temperatures from 1300 degrees Fahrenheit up to the highest degree of heat encountered.

### Huge Unnecessary Waste.

IT is estimated that in the United States alone several hundred thousand tons of steel are scrapped annually, or sold as an inferior product, because of lack of accurate temperature control in steel mill practices. The general adoption of this new robot in steel mills would save enough annually to construct the famous Chrysler Building 20 times over. The tremendous increase in the use of alloy steel in recent years makes a means of avoiding waste essential, since alloy steels are more expensive than ordinary steels, and losses due to inadequate temperature-control therefore more serious.

### An Automatic Light Control.

ANOTHER application of the electric eye, destined to affect almost every workman, office employee, or school child, was demonstrated next. A clever piece of apparatus automatically controls the lighting of factory, office, or school. When the day is gloomy, when a storm arises, or when for any reason daylight varies, artificial lights will be provided; and they will be turned off again when daylight gives sufficient illumination. An unvarying degree of minimum light will thus be provided without human interference wherever this new device is installed.

To demonstrate the new light control, the unit was set up on the stage of the auditorium. The artificial illumination came from the ceiling, while daylight was represented by light coming from both sides of the stage. Before beginning the demonstration, Mr. Breisky had the overhead artificial lights on the stage turned on, while the "daylight effect" was out. The approach of dawn was then simulated by gradually increasing the "daylight." At a certain point the electric eye acted, the main lights being automatically extinguished.

Thus a workman, near the point where such a unit was installed, would observe no variation below a fixed minimum in the amount of light falling on his work. Mr. Breisky now decreased the light coming from the sides of the stage, representing the waning of daylight. As soon as a pre-determined minimum was reached, the overhead lights were automatically turned on. A demonstration was thus completed of how a constant intensity of illumination can be maintained at a given point. Variations in daylight are often overlooked by persons responsible for the lighting of schools, streets, shops, or factories.

The eyesight and efficiency of many workers in large plants is affected if someone neglects to provide artificial light when it becomes necessary to supplement daylight. On the other hand waste occurs if the lights are left burning when not needed.

This automatic control is now used in one of the biggest factory aisles in the plant of the Westinghouse Electric and Manufacturing Company at East Pittsburgh. It has proved so valuable that several of the largest industrial concerns in the country are now installing such units.

THE engineer pointed out how the automatic light control device could be applied to many lighting problems. The illumination of electric signs or of display windows in shops may be similarly controlled, an additional possible feature being the use of time-clocks to darken the windows during the night hours when no illumination is desired.

Another interesting installation of this light control device, now in use, is that of controlling the flood lighting of several large gas-holders located in the vicinity of an airport to insure the flood-lights being on at any time during the day when daylight becomes too low. This prevents accidents to flyers and is used at the same time for orientation of aviators by means of markers on the top of the gas-holders.

Similarly, street lights may be automatically controlled so that adequate illumination is provided at all times without the possibility of the situation being overlooked by a busy or neglectful official.

### Other Applications.

A DEMONSTRATION was also made of other devices developed by the Westinghouse Company where the photo-electric cell is used. Everyone entering the room was automatically counted as he crossed a beam of light which was thrown across the doorway. The shadow of a passing body caused the electric eye to communicate with a counting machine. An automatic sorting machine was able to detect differences in the appearance of packages.