lyn. If any of our readers wish to gaze upon a scene of active city life we advise them to come and stand for a few minutes upon the steps of the new SCIENTIFIC AMERICAN office. The throng of passengers and vehicles constantly moving before our doors is remarkable.

We cannot very well close this little episode relating to the SCIENTIFIC AMERICAN offices without giving our readers a picture of our branch office at Washington. It is located at the corner of F and Seventh streets, directly opposite the Patent Office, a location which, by its convenience, greatly facilitates us in the dispatch of our affairs. In this and our New York establishment, aided by many able assistants, we are carrying on probably the largest and most successful business relating to patents that was ever undertaken by a single firm. We aim to do the work promptly, properly, and on moderate terms. That our labors, which now extend over a continuous period of more than thirty-five years, are highly satisfactory to the public, is seen in the wide patronage that we enjoy, and which steadily increases with each passing year.

IT is gratifying to know that Commissioner E. M. Marble has been prevailed upon to reconsider his proffered resignation of the Commissionership of Patents.

Manufacture of Oxygen Gas.

The industrial manufacture of oxygen has engaged much thought, while the uses, on a large scale, of that agent have not been very exactly determined. At Passy, says *Nature*, there are now works for producing the gas according to an improved method of MM. Brin frères, who attach the highest value to oxygen as an industrial agent, and indicate various applications of it. The process is the well known one in which caustic baryta absorbs oxygen from the air, and gives it up under heat. By a special way of preparing the baryta, however (described in *Annales Industrielles*), they render it highly retentive of its absorbent power, obviating the necessity of frequent renewal. After 400 operations there was (on microscopical examination) no appreciable change. The baryta is placed, at Passy, in metallic retorts connected, in groups of fifteen, in two furnaces heated with gaseous fuel. A locomotive engine drives Root blowers, which force air into the retorts; after peroxidation the oxygen is liberated by heat, and pumped into the gasometer through an apparatus which removes traces of carbonic acid. As it is found that the peroxidation takes place better with moist than with dry air, the air is passed through a saturator on its way to the retorts. For production of 5,000 cubic meters of oxygen a day in Paris, it is estimated (from the data at Passy) that the cost per cubic meter would be from 0·12 to 0·15 franc, according as coal or coke was used for fuel. The price of 100 kilogrammes of baryta prepared by the new method is about 250 francs.

Wild Beasts and Snakes in India.

It is with somewhat more than ordinary interest that we have for some years past awaited the annual records setting forth the fearful ravages wrought by tigers and other wild animals, and by snakes, throughout our Indian empire. From a brief notice which appears in the columns of a contemporary, we now learn that there has been a steady *decrease*, from 1876 to 1880, in the total number of wild animals destroyed throughout Hindostan, coupled, however, with a proportionate *increase* in the number of persons killed by wild animals and snakes. Thus, whereas in the year first named there were destroyed in Hindostan no fewer than 23,459 wild beasts, in 1880 the figures diminished to 14,886; but, during this same period, the number of human beings who have lost their lives has mounted up from 19,272 to 21,990! One satisfactory feature observable in the present annual returns is that relating to the great increase in the number of snakes destroyed in the Bombay Presidency alone. Of course, it must be a matter of impossibility to suggest an antidote for the mortal injuries inflicted by a wild beast such as the tiger; but there would seem to be a good field now presented for the further prosecution of the experiments already made by Dr. De Lacerda in connection with a specific for snake bite.

Consolidation of Torpedo Interests.

The various patentees of electrical devices for torpedoes have lately combined in one corporation, to be known as the Lay Torpedo Company. By combining all the recent improvements in devices for reducing the size, increasing the speed, and controlling the discharge of movable torpedoes, it is believed that torpedo boats can be built at once smaller, lighter, and faster than any before seen; boats that can be run on or below the surface, as may be desired; steered in any direction, and stopped at will; exploded by the operator or automatically, as may be desired, the charge being 100 pounds of explosive equal to dynamite in power. One wire will carry the current for stopping, starting, steering, or firing.

Electricity from Crystals.

Jacques and Curie have shown that by the mere compression of an inclined hemihedral crystal, electricity is developed. They experimented by placing a crystal or a suitable section of it between two sheets of tin foil insulated on the exterior by plates of caoutchouc, the tin foil being connected to a galvanometer. By now compressing the crystal in a vise or otherwise, electricity is developed and may be measured by the galvanometer. The electricity developed is the opposite of that produced by heating a crystal—that is to say, the extremity of the crystal which becomes positive on heating, becomes negative on compression. On releasing the pressure, electricity of an opposite kind is produced. The authors find that the production of electricity by pressure can only be obtained with hemihedral crystals having inclined faces. By combining a number of such crystals in a pile, they have invented a new apparatus for producing electricity. The amount of electricity developed varies for different minerals. They find, for example, that a section of quartz, cut perpendicular to the main axis, evolves more electricity than a similar section of tourmaline.

IMPROVED PULVERIZER.

A very simple and effective pulverizing machine has lately been perfected by Messrs. Thomas B. Jordan & Son,

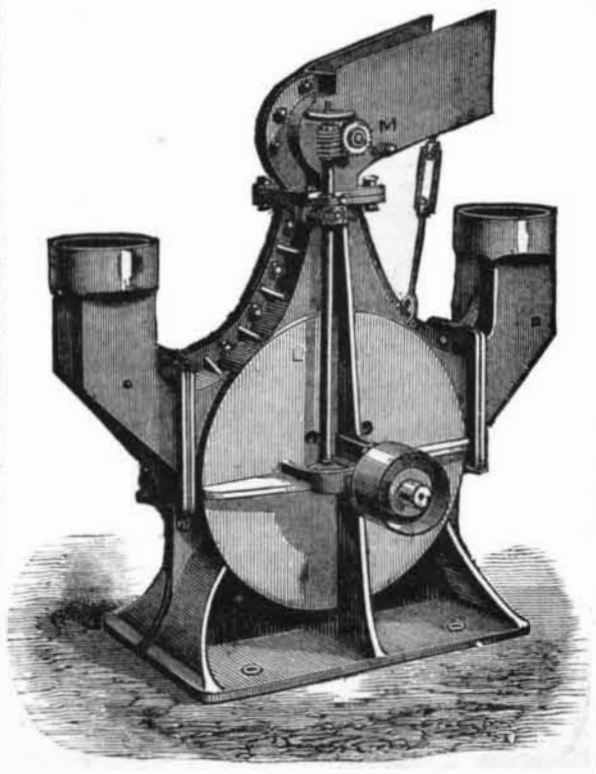

FIG. 1.
IMPROVED PULVERIZER.

London, and which is represented in the two engravings. Requiring a machine of this class for their own use, and not finding one in the market sufficiently simple or effective for their purpose, Messrs. Jordan, after long and careful experiments, perfected this machine, which constitutes an important advance in crushing apparatus. In our engravings, Fig. 1 is a general perspective view of the machine; while Fig. 2 is a vertical section showing its internal arrangement. In this machine, two circular dished castings, A A, each having a long bearing, B, projecting from its center, are bolted together by their flanges, C C, and form the crushing chamber, D D, which has an inlet opening on the top, E, and two outlet openings, one on each side, F F. The two bearings carry short wrought iron spindles at B, which meet end to end at the center of the crushing chamber. On the inner

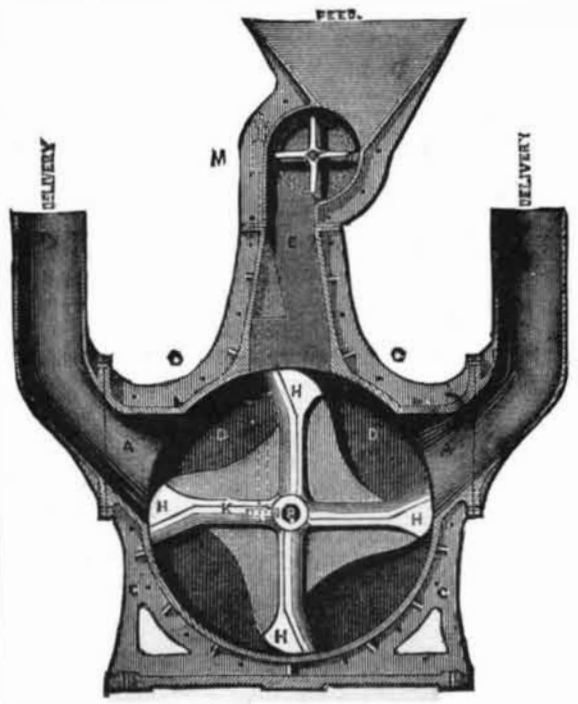

FIG. 2.
IMPROVED PULVERIZER.

side of each spindle is keyed a set of four arms, H H H H, of the diameter of the chamber, the surfaces of the one set of arms being so angled at 45 degrees with the horizontal center line that they are parallel to and face those of the other set. These arms revolve in opposite directions, passing close to each other and to the sides of the chamber, and their backs are so formed as to create a blowing or fan action in the chamber, drawing air through openings placed in the sides and near the center of the chamber. On the outer end of the spindles, at B, are keyed pulleys for driving by belts, the spindles and their arms and pulleys being quite free and independent of each other to turn in reverse directions. One of the spindles at K, has a worm engaging a wheel, and working the vertical shaft, L, which drives at a given speed the automatic feeder, M. By means of driving belts on the pulleys the spindles and their arms are revolved in reverse directions at any suitable speed for the material to be crushed. The material falling into the chamber from the automatic feeder is struck by one of the arms (owing to the angle of its face) into the path of those revolving in the reverse direction, and is by them, for the same reason, immediately returned; thus it is with great force struck to and fro from arm to arm until reduced as fine as required. There is, therefore, no grinding action, the crushing being done entirely by percussion or impact, but without centrifugal force. This is the whole process of crushing. The fineness of the material leaving the machine is regulated not by sieves in the ordinary way, but by the current of air, which immediately carries off all particles light enough for its force to suspend, and the force of this current can be accurately adjusted by closing or opening the apertures in the casing. The current in the machine is sufficient to carry the crushed material up 10 or 20 feet of pipe to another chamber, the height of which column of pipes also regulating the size of the particles delivered, different sizes being delivered at various levels if required. It will thus be seen that the machine is extremely simple; complete in itself and self-contained; there is very slight wear and tear; and great saving of power, there being no grinding action or friction between the parts of the machine, and the crushed material leaving the machine immediately in the state required, giving place to fresh crude stuff. Although very recently introduced, several of these machines are already in use in a cement factory, where they are doing good work. Being applicable to the reduction of any kind of material to the finest possible powder without sieving, this pulverizer undoubtedly has a large future before it.

The Cola Nut.

Sir Joseph Hooker's recently issued report on Kew Gardens contains an interesting note on the subject of the cola nut. They are the seeds of a tree, *Cola acuminata*, belonging to the natural order Sterculiaceæ. From six to twelve are contained in woody pods, from three inches to six inches in length, of which five or less are produced by each flower. Like olives, they are said to enhance the flavor of whatever is eaten after them. But their most important property is that they are said to have the power of staying, even for a prolonged period, the cravings of hunger, and of enabling those who eat them to endure prolonged labor without fatigue. In a report by Consul Berkeley, from the Gambia, some interesting facts relating to the large trade done in them in West Africa are given. The import of these nuts was, in 1879, no less than 108,000 pounds more than in 1878: while, on the other hand, the exports were also 58,000 pounds in excess. The trade in cola nuts is an attractive feature in the commerce of the Gambia. They are the product of the Sierra Leone district, and the trade in them, both at Sierra Leone and the Gambia, is almost exclusively in the hands of women, to a large number of whom it affords the means of livelihood, and in many instances the acquisition of considerable wealth. They are largely consumed by the natives of the Gambia, and are of bitter taste and produce no exhilarating effect, but are said to possess the power of satisfying for a considerable time the cravings of hunger. For this purpose, however, the nut is much less used than it is as a luxury. The trade in the article is rapidly increasing. In the year 1860 the import was about 150,000 pounds; in 1870 it had increased to about 416,000 pounds; while in 1879 it had increased to over 743,000 pounds. During the past ten years, also, the trade has spread to Central African, and even to the African shores of the Mediterranean. It is pointed out by Sir Joseph Hooker that the *Cola acuminata*, in fact, plays the same part in tropical Africa that Erythroxylon coca does in South America. The plant has been introduced into the West Indies, and it having been suggested that the nuts would be valued in the Indian Ocean, the plant has been successfully propagated at Kew, and thence has been distributed to the Botanic Gardens at Calcutta, Cambridge (United States of America), Ceylon, Demerara, Dominica, Mauritius, Sydney, and Zanzibar.—*London Times.*

The Waukegan Artesian Well.

Waukegan, Illinois, is in latitude 42° 30′ N., longitude 88° W., on a bluff 80 feet above and overlooking Lake Michigan. Settled in 1834, it was incorporated as a city in 1859. A water supply is procured from an artesian well, completed in 1875 to a depth of 1,134 feet. Rock is encountered 180 feet from the surface, to which depth the boring is cased with a four-inch iron pipe. The first pipe put in corroded and was replaced in 1881.

The water will rise to 65 feet above the surface. The well discharges into a brick tank 20 feet square and 20 feet high, built half above and half below the surface of the ground, on the highest land in the city. The supply is copious and constant.

From the tank it is distributed by cast iron pipe, of which three miles, mostly of six inch diameter, are laid, with fifteen fire hydrants.

The population in 1880 was 4,031. The daily consumption is not stated. The yield of the well is in excess of the present demand. The cost of the well was $3,350.