The Persecuted Chinaman.

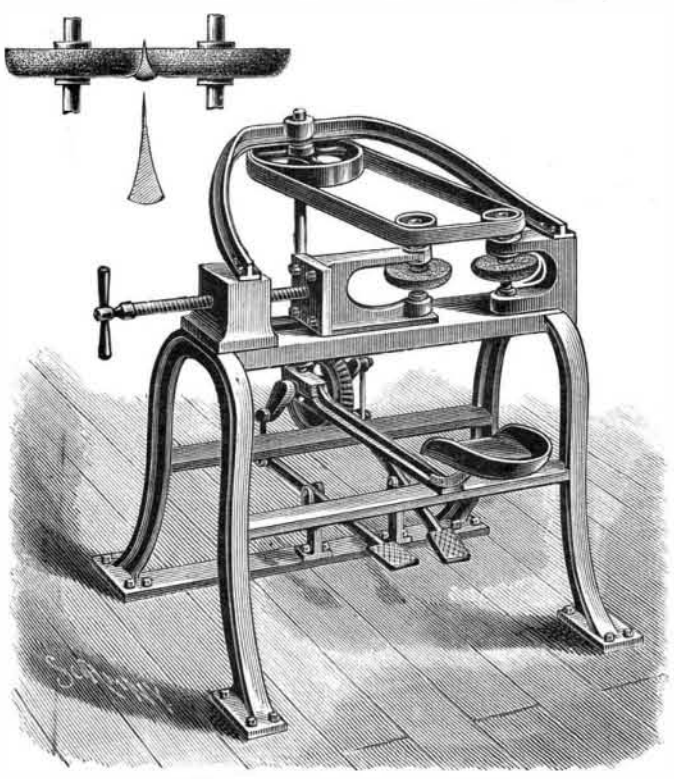
We add our protest to others against the Chinese census bill which has passed the House of Representatives, and is now pending in the United States Senate. This bill requires the Superintendent of Census to give to every Chinaman in the country a certificate, which, after ninety days from the date of the beginning of the enumeration, shall be the sole evidence of his right to remain in the United States, and in the absence of which he shall be liable to deportation or to imprisonment for five years. We are glad to see that the committee of the Senate proposes to omit the clause making the right of a Chinaman to remain in this country dependent upon the certificate. But this is only a mitigation of the wrong threatened by this bill. We do not deny the right of the nation to sift out, or even to exclude by proper legislation, immigrants whose coming the nation believes to be dangerous to its well-being. But, the *Christian Union* says, to select a certain class who have come, and put them under special restriction and requirements and render them subject to exile from the land of their adoption for no crime whatever, is an act wholly unjustifiable and wholly unworthy a great nation. It is difficult, indeed, to conceive even a specious argument for such legislation.

The Action of Water at High Temperatures and at Great Pressures upon Wood and Cellulose.

Pure cellulose gives traces of sugar at the ordinary pressure. At higher pressures the quantity of sugar increases, but at 20 atmospheres it is converted into hydrocellulose. Wood is attacked by water at the ordinary pressure, but the action reaches its maximum at 5 atmospheres, when beech wood loses 26·7 per cent of its weight, of which 11 per cent becomes sugar. There are also produced dextrines, precipitable by alcohol. No vanilline is obtained from the aqueous or ethereal extracts, or from the dried residues. The color reactions of Ihl must be due to the transformation of lignine into carbohydrates.—*H. Tauss* (*Dingler*).

AN IMPROVED GRINDING MACHINE.

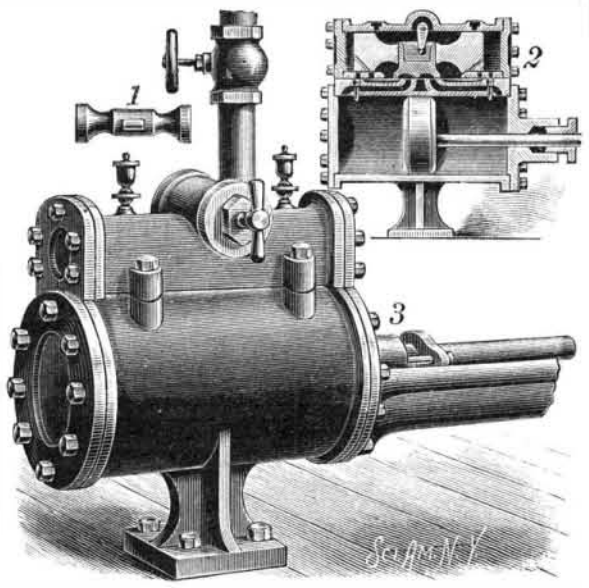
The accompanying illustration represents a machine specially designed for grinding razors and similar articles concave or hollow. It has been patented by Mr. George J. Ridley, of No. 146 Wall Street, Auburn, N. Y. In the top crossbeam of the frame is a bearing supporting a vertical shaft, on which is a grinding wheel with curved periphery. Directly opposite this wheel is a second grinding wheel, the shaft of which is mounted to turn in suitable bearings on a block adapted to slide on the top crossbeam of the frame, toward or from the other wheel. The block is moved with a screw, and is locked in place when adjusted by bolts extending downward through a slot in the top crossbeam. On the upper ends of the shafts carrying the grinding wheels are pulleys, over which passes a belt, also passing over a large pulley on the upper end of a rear vertical shaft, motion being communicated to the latter shaft by a bevel gear and pinion from a transverse shaft operated by cranks connected with treadles. A seat is located in front of the machine in such a manner as to enable the operator seated thereon to conveniently actuate the treadles and hold the articles to be ground in contact with the wheels. The small figures represent the adjustment of the wheels for grinding razors concave or hollow. By removing the treadles and attaching a pulley the machine may be run by power, when, by using a drip to keep the steel from heating, work may be done with great rapidity.



RIDLEY'S GRINDING MACHINE.

AN IMPROVED STEAM ENGINE VALVE.

An automatic valve mechanism for steam engines, designed to be operative without the use of an eccentric or crank, is shown in the accompanying illustration, and has been patented by Mr. William Gehring, of the Standard Iron Works, San Diego, Cal. Fig. 1 is a side view of the valve-operating piston, and



GEHRING'S VALVE FOR STEAM ENGINES.

Fig. 2 a longitudinal section of the cylinder and valve chest, Fig. 3 being a view in perspective showing the application of the improvement. A steam cheston top of the cylinder covers the valve seat, and is provided with a cylinder in which slides the valve-operating piston. The valve seat has an exhaust port, and steam ports which communicate with the ends of the cylinder. To the valve seat is fitted a double main valve, in the back of which is a cavity for receiving an arm on a shaft extending through the side of the valve chest, and provided with a starting lever. The valve-operating piston has a central mortise for receiving the rectangular back of the main valve, and in the heads of the piston are diagonal passages through which steam is admitted to spaces at each end of the steam chest. In the lower part of the valve cylinder are live steam ports and exhaust ports. In the top of the main cylinder, underneath the exhaust ports in each end of the valve cylinder, is a valve casing with a spring-pressed tappet valve, whose stem extends into the path of the power piston, the latter having beveled ends for engaging these valve stems as the piston nears the end of its stroke in either direction. By this arrangement the tappet valves are operated to admit steam to the space at the ends of the valve-operating piston. This valve mechanism, though applicable for general purposes, is particularly designed for use in connection with steam pumps.

Synthetic Indigo.

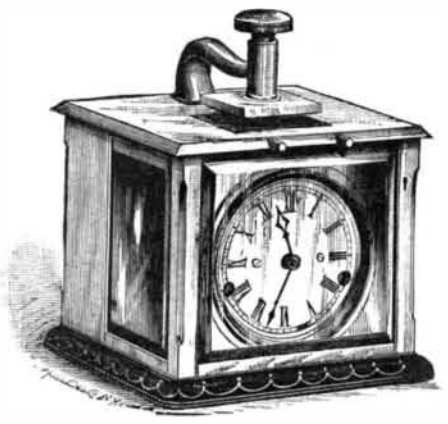
A new and very simple method of synthesizing indigo has been discovered by Dr. Flimm, of Darmstadt (*Berichte*, No. 1, 1890, *Science*). In studying the action of caustic alkalies upon the monobromine derivative of acetanilid $C_6H_5NH.CO.CH_2Br$, a solid melting at 131·5°, it was found that when this substance was fused with caustic potash, a product was obtained which at once gave an indigo blue color on the addition of water, and quite a considerable quantity of a blue solid resembling indigo separated out. The best mode of carrying out the operation, according to *Nature*, is described by Dr. Flimm as follows:

"The monobrom acetanilid is carefully mixed with dry caustic potash in a mortar, and the mixture introduced into a retort and heated rapidly until a homogeneous reddish brown melt is obtained. This is subsequently dissolved in water and a little ammonia or ammonium chloride solution added, when the liquid immediately becomes green, which color rapidly changes into a dark blue, and in a short time the blue coloring matter is for the most part deposited upon the bottom of the vessel in which the operation is performed. The fused mass may also conveniently be dissolved in dilute hydrochloric acid and a little ferric chloride added, when the formation of indigo takes place immediately. The collected blue coloring matter may be readily obtained pure by washing first with dilute hydrochloric acid, and afterward with alcohol."

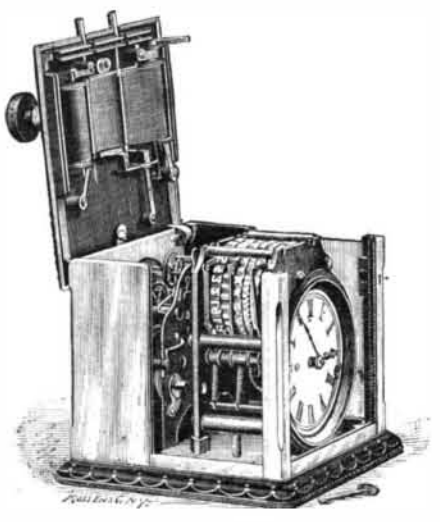
That this blue substance was really common indigo was proved by the fact that it yielded several of the most characteristic reactions of indigotin, such as solubility in aniline, paraffin, and chloroform; its sublimation; and the formation of sulphonic acids, which gave similar changes of color with nitric acid to those of indigotin. The final proof was afforded by its reduction to indigo white and reoxidation to indigo blue by exposure to air. Moreover, the absorption spectrum of the coloring matter was found to be identical with the well known absorption spectrum of indigo; hence there can be no doubt that indigo is really formed by this very simple process.

AUTOMATIC TIME AND DATING STAMPS.

A small compact instrument which is an effective watchman's time clock, and by means of which, by the simple pressure of the hand, the time, date, names, and other designations may be instantly recorded or printed on documents and papers, forms the subject of a patent recently issued to Mr. Charles Stahlberg, of Brooklyn, N. Y. This instrument requires no attention except winding once a week, the month, date, and time of day, to the fraction of a minute, being set automatically at the proper second, including the automatic setting of the first day of a new month from a long or short month, and February of a common or leap year. It is in fact an automatic perpetual calendar, which indicates on paper at any moment the year, month, day, hour, and minute of time on which it is used. The type wheels of the instrument have on their periphery the type corresponding to the divisions of time which each one is intended to print—first, the year wheel; second, the meridian and hour wheel operating mechanism; third, a meridian wheel; fourth, a minute wheel; fifth, a minute wheel operating mechanism; sixth, an hour wheel; seventh, a date wheel operating mechanism; eighth, a date wheel; ninth, a month wheel; and finally, a month wheel operating mechanism. The clock movement is constructed to move the shaft which actuates the type wheel mechanism equal distances at intervals of one minute, or at such intervals as is desirable, the shaft being stationary during the intervals, the intermittent motion of the actuating shaft being gained by the interposition of an auxiliary motor or spring in the train of the clock. This really divides the clock train into two portions, the lower portion of the train being driven by the main springs of the clock, and its office being to wind the auxiliary motor spring once a minute. By this means the power driving the time movement is equalized every minute, and the clock is run under the best possible conditions for the attainment of accuracy. The inking ribbon and mechanism necessary for adjusting it are attached to the hinged cover of the case, giving ready access thereto when the cover is turned back. To guard against picking the lock which opens the stamp, means are supplied to attach a seal. The mechanism, being automatic, can be placed in connection, electrically or otherwise, in police, messenger, and telephone service, with stock tickers, etc., and wherever it is desirable to keep an exact record of date and time to the minute. It is one of the most reliable and effective devices that has come under our notice. The instruments are furnished by the Accurate Time Stamp Co., No. 431 Eleventh Avenue, New York City.



NEW TIME STAMP—CLOSED.



NEW TIME STAMP—OPEN.

THE question of the best form of meter for registering the supply of electricity to private consumers is being argued in English electrical circles.

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