wood, or cucumber tree, or poplar—any wood that is soft on end, or brooms slightly, and contains no pitch or gum. A fine dead surface can be got thus with powdered oil stone, and the stick may be whittled to work in curves and channels.

Scraping for ornament is quite common, but as usually practiced it is as objectionable as stoning—there is too much of it. The flat scraper should never be used for ornament—only the round nose and the "bagnet" scrapers. And for this purpose the scraper should never be used in right lines, only in curves, making "curly-cues." The surface to be scraped for ornament should be filed or emery rubbed to take out all turning marks and planed ridges; no suggestion of the lathe or the planer tool should be left. Stoning looks well on either a dead smooth surface or on one of high polish. Scraping over a planed surface, left as it came from the planer, only serves to show, with more distinctness, the furrows and ridges inseparable from planing, even with a finish tool. And the scraping should be done with a very light hand, so that its effect on the surface could not be detected by the finger ends.

Some very unique work, partaking of the scraping process, was noticed lately in a shop where fine machine tools are made. The scraper was formed with very fine teeth. It was forged from a three-eighths square bar of fine steel of the proper length for use, the end flattened slightly and turned at right angles, the angular portion projecting perhaps one-eighth of an inch. This portion was ground, milled, or filed to an edge, and then was chased on a "hob," or master tap of fine thread, from a pitch of 60 to one of 100 to the inch. The tool was then hardened and drawn to a straw color. The size here designated may be varied at will; indeed, to do the best work several sizes are necessary. Following graceful curves, these tools will produce a series of fine parallel lines suggesting the engine turning on the backs of watches. The surface for this work should be finely finished and polished.

Some acids judiciously applied produce fine effects. Etching in patterns ought to be confined to finished steel, wrought iron, copper, brass, and bronze; when used on cast iron for pattern work, the acid will not leave clean lines. Ordinary etching in pattern is done by cleaning the surface with lye, then covering it with engravers' etching ground, made of Venice turpentine, Burgundy pitch, and spirits of turpentine. It may be obtained ready prepared at supply stores for engravers and for calico printers. Or a coat of common beeswax melted and rubbed on with a cloth or applied on the heated work, if heating is feasible. The pattern is made through the resistant etching ground by means of suitably shaped steel points, hard enough to scratch the metal. Then equal parts of sulphuric and nitric acids, with twice their combined volume of water, or more, if the metal is soft like copper, are mixed and applied to the work. The pattern will be etched after an hour's exposure, the resistant defending the finished portions.

Lemon juice is very effective on a surface of cast iron, and its result is quite elegant. It turns the portion of polished cast iron to which it is applied to a bronze black, and when touched over with shellac will absorb a sufficient amount of the varnish to preserve it. To many, lemon juice would seem to be a weak and ineffective acid for metal; but every one knows how quickly a knife blade of steel will blacken when used to cut a lemon. The writer has a lemon squeezer made of cast iron, zincked, which with use has a hole eaten through it half an inch diameter, by the action of the acid. The darkening of polished iron by this citric acid is very beautiful.

THE first shipment of Alabama coal to a foreign port was made from Mobile to Cuba last week by schooner.

The Patent Office Business of 1885.

According to the recently submitted report of the Commissioner, covering the business of the Patent Office for the last calendar year, it appears that there were 24,233 patents and reissues granted in 1885, as against 20,413 in 1884, and 22,383 in 1883. The States represented by more than 1,000 patents each were New York, 4,532; Pennsylvania, 2,454; Massachusetts, 2,243; Illinois, 1,907; Ohio, 1,837; New Jersey, 1,115; and Connecticut, 1,011. The patents issued to citizens of foreign countries numbered 1,549. The total expenditures on account of the office were $1,024,378.85, and the receipts were $1,188,089.15, or a surplus for the year of $163,710.30. The accumulated surplus in the treasury of the United States on account of the Patent fund amounted, Jan. 1, to $2,945,405.58, there having been but seven years since 1838 which failed to add to the accumulation.

The Commissioner again points out the great need that there is for more room and a larger force for the proper transaction and prompt disposal of the work of the Patent Office—matters which have been repeatedly brought to the attention of Congress. It is extremely hard to understand the hesitation and apparent reluctance of that body to make the needful provisions for the growing business of the office, while its receipts have been so steadily in excess of the expenditures; and, as this is a long session, it is to be hoped that more careful consideration will be given the subject than it received in the last Congress. The Commissioner further suggests an increase in the price of the *Official Gazette*, which is now twice as large as it was when it was started for $5 a year, and also recommends that the Patent Office itself be intrusted with the photo-lithographic work of printing it, which is now done under contract by outside parties. A laboratory for the special testing of electrical apparatus is likewise suggested as a desirable addition that should be made to the facilities of the office. The inventions coming into the office were, thirty years ago, divided into but thirteen classes, whereas they now comprise 177 distinct classes, and the distinctions which are constantly required to be made have become so nice that the greatest care and skill are necessary to determine accurately what is new and what is old. Congress should no longer trifle with the needs of this important and always self-sustaining department of the Government, and it is hoped the Commissioner's suggestions will be heeded before the session closes.

IN packing bottles in cases for transportation, India rubber bands slipped over them will prevent breakage.

NIGHT SKY—FEBRUARY AND MARCH.

BY RICHARD A. PROCTOR.

The Great Bear (*Ursa Major*), with its Dipper and Pointers, is now high up in the northeastern sky. The Pointers direct us to the Pole Star, α of the Little Bear (*Ursa Minor*). A line from the Pole Star to the Guardians of the Pole (β and γ) lies in the position of the minute hand of a clock 18 minutes after the hour. The Dragon (*Draco*) extends from between the Bears to the horizon—east of north—where its head with its two bright eyes can be seen.

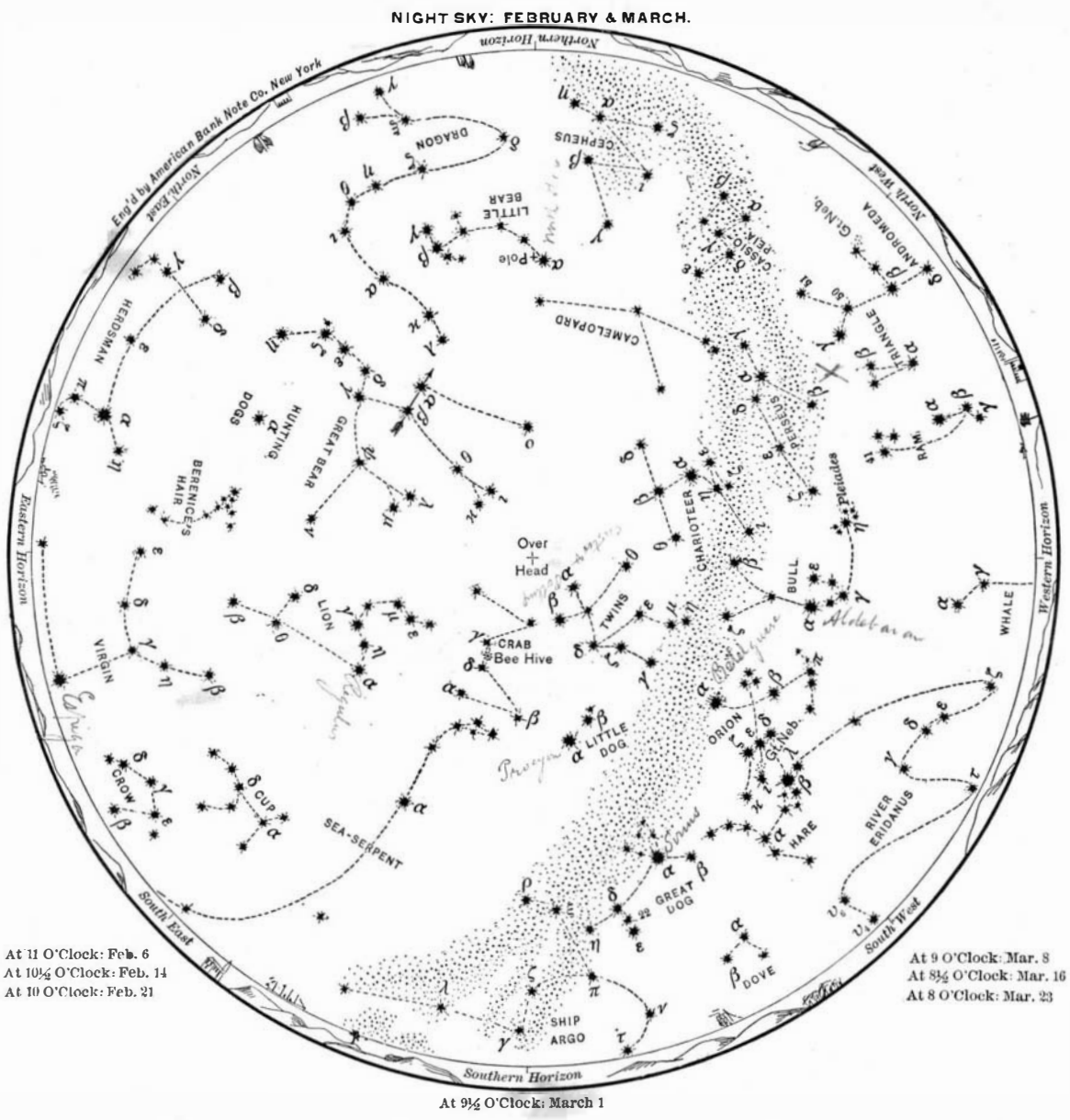
Cepheus is low down, somewhat to the west of north; his Queen (*Cassiopeia*), the Seated Lady, beside him (α and β mark the top rail of her chair's back); while above her lies the poor constellation *Camelopardus*, the Giraffe.

Andromeda, the Chained Lady, is in the northwest, low down—in fact, partly set; the Triangle, and next the Ram (*Aries*), beside her, toward the west. Above them is *Perseus*, the Rescuing Knight; and above him, somewhat to the west, the Charioteer (*Auriga*). The Bull (*Taurus*), with the Pleiades and the bright Aldebaran, is in the mid-heaven, due east; *Gemini*, the Twins, higher, and toward the southwest. Orion, below them, is already slanting toward his grave, low down in the west; beneath him the Hare, and in the southwest a part of the River (*Eridanus*).

Due south is a part of the Star Ship (*Argo*), beside which, low down, is the foolish Dove (*Columba*), while above leaps the Great Dog (*Canis Major*), with the splendid Sirius, chief of all the stars in the sky, marking his mouth. High up, a little west of north, is the Little Dog (*Canis Minor*), and higher, a little east of north, the Crab (*Cancer*), the dark constellation, as it was called of old, with the pretty cluster, *Prosepe*, or the Beehive.

The Sea Serpent (*Hydra*) is rearing his long neck high above the horizon, bearing, absurdly enough, on his back Noah's Cup (*Crater*) and Noah's Raven or Crow (*Corvus*).

Nearly due east, the Virgin (*Virgo*) has risen, Spica shining brightly just above the horizon. The Lion (*Leo*) occupies the midspace above; the "Sickle in the Lion"—its handle marked by η and α, its curved blade by γ, μ, and ϵ—will at once be recognized. The Hair of Queen Berenice (*Coma Berenices*) is nearly due east, and fairly high. Between this small but remarkable group and the Great Bear lies Hevelius' foolish constellation, the Hunting Dogs (*Canes Venatici*). Lastly, in the northeast, the Herdsman (*Bootes*), with the orange-yellow brilliant Arcturus, is rising, though at present, paradoxical as it may seem, he lies on his back.



In the map, stars of the first magnitude are eight-pointed; second magnitude, six-pointed; third magnitude, five-pointed; fourth magnitude (a few), four-pointed; fifth magnitude (very few), three-pointed; counting the points only as shown in the solid outline, without the intermediate lines signifying star rays.

A Georgia Willow Farm.

About a mile below the city of Macon is the osier willow farm of Mr. I. C. Plant, which has been visited by a correspondent of the *American Druggist.* The willow switches, at the end of two years, are from four to seven feet long, and are cut and gathered into bunches like sheaves of wheat. In the stripping building they are steeped in water, and the bark at the larger end loosened for a couple of inches by machinery. The leaves and bark are then removed by a little machine devised by Mr. Plant. One by one the switches are placed in the mechanical stripper, and with a pair of pliers are pulled through with a sudden jerk. They are then wiped off with a woolen cloth, bundled, and laid away to dry.

All the leaves and bark are dried and baled. They are used for medicinal purposes, and command a price of twenty-five cents a pound. There are at present 400,000 willows growing on the farm, and 80,000 additional slips have recently been set out. The entire levee is to be eventually covered with them, when sixty acres will be devoted to this single crop. The average yield is a ton to the acre. When dried, the willows command $200 per ton, and find a ready market.