ASTRONOMICAL NOTES.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, October 26, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

	H M.		H.M.
Venus rises	5 33 mo.	Uranus rises	1 25 mo.
Mars rises	5 22 mo.	Neptune rises	5 21 eve.
Jupiter sets	10 28 eve.	Neptune in meridian	0 09 mo.
Saturn in meridian	9 32 eve.		

FIRST MAGNITUDE STARS, ETC.

	H.M.		H.M.
Alpheratz in meridian	9 41 eve.	Procyon rises	10 52 eve.
Mira (var.) in meridian	11 51 eve.	Regulus rises	1 00 mo.
Algol (var.) in meridian	0 42 mo.	Spica rises	5 37 mo.
7 stars (Pleiades) in merid.	1 22 mo.	Arcturus sets	7 01 eve.
Aldebaran rises	7 10 eve.	Antares sets	6 21 eve.
Capella in meridian	2 49 mo.	Vega sets	1 09 mo.
Rigel rises	9 16 eve.	Altair sets	11 53 eve.
Betelgeuse rises	9 02 eve.	Deneb sets	4 14 mo.
Sirius rises	11 17 eve.	Fomalhaut in meridian	8 30 eve.

REMARKS.

Neptune will be brightest October 31, being at that time 180° from the sun, and rising at sunset He has been seen at opposition with a telescope of 4-inch aperture, and a smaller instrument will undoubtedly show him, provided the observer knows just where to look. His right ascension, October 31, at midnight, is 2h. 26m. 25 sec.; declination, 12° 33′ 46″+. Jupiter will be very near the moon October 31, at setting, being a trifle north of the moon.

PENN YAN, N. Y., Saturday, November 2, 1878.

PLANETS.

	H.M.		H.M.
Venus rises	5 52 mo.	Saturn in meridian	9 03 eve.
Mars rises	5 17 mo.	Uranus rises	0 58 mo.
Jupiter sets	10 05 eve.	Neptune in meridian	11 37 eve.

FIRST MAGNITUDE STARS, ETC.

	H.M.		H.M.
Alpheratz in meridian	9 13 eve.	Procyon rises	10 25 eve.
Mira (var.) in meridian	11 23 eve.	Regulus rises	0 32 mo.
Algol (var.) in meridian	0 15 mo.	Spica rises	5 09 mo.
7 stars (Pleiades) in merid.	0 55 mo.	Arcturus sets	6 34 eve.
Aldebaran rises	6 42 eve.	Antares sets	5 54 eve.
Capella in meridian	2 22 mo.	Vega sets	0 41 mo.
Rigel rises	8 49 eve.	Altair sets	11 25 eve.
Betelgeuse rises	8 34 eve.	Deneb sets	3 47 mo.
Sirius rises	10 50 eve.	Fomalhaut in meridian	8 02 eve.

REMARKS.

Saturn will be near the moon November 5, 8h. 47m. evening, being then about 7° south of her. Monday evening the moon will be in the cluster of small stars which constitute the Western Fish.

It is now shown that Professor James C. Watson's observations of the intra-Mercurial planet agree with Mr. Lewis Swift's, of Rochester, N. Y., and also corroborate those of Dr. Lescarbault. Hence Dr. Lescarbault should be considered the discoverer of "Vulcan." Professor Watson, however, is quite confident that he has discovered another intra-Mercurial planet, which at first he supposed was the star *Zeta Cancri*. These planets probably have very eccentric orbits, and careful and persistent search with good refractors, provided with very long dew tubes, blackened inside, may result in finding them, probably less than 15° east or west of the sun. If not found thus or caught while making a transit, astronomers will have to wait until 1880 or 1882 for a solar eclipse to reveal them.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although only approximate, they will enable the ordinary observer to find the planets.

M. M.

Positions of Planets for November, 1878.

Mercury.

Mercury rises on November 1 at 7h. 3m. A.M., and sets at 5h. 1m. P.M. On November 30 Mercury rises at 8h. 54m. A.M., and sets at 5h. 29m. P.M.

Mercury passes the meridian at 1h. 11m. P.M. on the 30th. This planet should be looked for just after sunset, south of the point of sunset; it will probably not be seen with the eye before the first week in December.

Venus.

Venus rises on November 1 at 5h. 51m. A.M., and sets at 4h. 34m. P.M. On November 30 Venus rises at 7h. 5m. A.M., and sets at 4h. 23m. P.M.

The daily path of Venus is so nearly that of the sun that it is not likely to be seen.

Mars.

Mars is very small, and although it rises before the sun and further north, it will not be likely to attract attention.

On November 1 Mars rises at 5h. 20m. A.M., and sets at 4h. 16m. P.M. On November 30 Mars rises at 5h. 6m. A.M., and sets at 3h. 11m. P.M.

Jupiter.

Jupiter is less conspicuous, but is still the most brilliant object in the evening skies. It is visible as soon as sunset, a little west of the meridian, and at an altitude of 27° or 28°.

On November 1 Jupiter rises at 43m. after noon, and sets at 10h. 5m. P.M. On November 30 Jupiter rises at 11h. 3m. A.M., and sets at 8h. 33m. P.M.

If we take the hour from 7 to 8 P.M. to look at Jupiter, the 1st satellite will be unseen because it is crossing the face of Jupiter on the 1st and 24th; it will be unseen at that time on the 2d and 25th, because it is in the shadow of Jupiter; on the 9th, because it is behind Jupiter.

The smallest satellite, the second in distance from Jupiter, will be invisible between 7 and 8 P.M. by coming in front of Jupiter on the 14th, going into Jupiter's shadow on the 23d, and going behind Jupiter on the 30th.

The largest satellite, the third in distance from Jupiter, will be crossing the planet's disk at this time, on the 17th and on the 28th will be in the shadow of the planet.

The 4th satellite will be invisible more than four hours on the 15th, as its motion is slow and it then makes a passage across the face of the planet.

Saturn.

Saturn will be in excellent position for evening observers all through November.

On November 1 Saturn rises at 3h. 20m. P.M., and sets at 2h. 55m. A.M. of the next day. On November 30 Saturn rises at 1h. 24m. P.M., and sets at 57m. after midnight.

Saturn surpasses Jupiter in interest to those who have good glasses. With even an ordinary glass, the projection of the ring on each side the ball of the planet can be seen, and the largest moon can be watched around in its orbit of 16 days' duration.

With a large telescope at this time the ring is seen as little different from a line; but the small satellites gathered around it make the whole system exceedingly interesting, and the view exquisitely beautiful.

Saturn can be known by its white light, and the fact that it is nearly on the meridian about 8 P.M., and at an elevation of about 44°.

Uranus.

On November 1 Uranus rises at 1h. 1m. A.M., and sets at 2h. 20m. P.M. On November 30 Uranus rises at 11h. 6m. P.M., and sets at 24m. after noon of next day.

Neptune.

Neptune rises on November 1 at 4h. 55m. P.M., and sets at 6h. 27m. the next day. On the 30th Neptune rises at 2h. 59m. P.M., and sets at 4h. 29m. A.M. of the next day.

Displays of Ingenuity at the Boston Mechanics' Fair.

The quality and quantity of the various products of industry being at present exhibited at the Mechanics' Exposition in Boston far exceed those of any previous exhibition in that city. Contrivances of all kinds are there; from the everlasting sewing machine, in twenty different shapes—each explained and recommended with the usual amount of volubility—to elaborate philosophical, electrical, and surveying instruments of perfect workmanship and superb finish.

Such apparatus, however, require diagrams and illustrations in order to render their distinctive features intelligible. The same may be said of other exhibits, as, for instance, the extensive display of silverware, prominent among which are some very attractive specimens by Reed & Barton, of New York city.

In this exhibition, as in all others of a similar character, there is very much which must be seen rather than written about, to be understood and appreciated. In those products, processes, and inventions that are of real practical utility there is much interest, and to a few of these reference is now made.

From the Creosote Wood Preserving Works at Elizabethport, N. J., there is a curious display of different woods that have been under water, some from New York harbor and other places, showing the rapid destruction caused by the *Teredo navalis*. The ravages caused by this and other marine or land worms and insects are astonishing. Thousands of holes are bored in all directions with geometrical accuracy, until the planking or pile is nothing else than a mass of worm cells. The destruction to wharves and ships by the *Teredo* is something enormous. It has been demonstrated, however, by forty years' experience in Europe, that timber well injected with creosote oil is absolutely protected from decay, wherever exposed, and from destruction by the *Teredo* and other worms. Creosoted ties, it is said, last in Europe from twelve to twenty-five years, and both ties and bridge timber thus preserved are in general use on most of the railways in Great Britain and on the Continent.

The specimens on exhibition show very clearly the effect of creosote on wood, and prove how effectual it is in the preservation of railroad ties, piles, timber and planking for vessels, etc.—wherever, in short, wood is liable to decay.

The process known as the "Hayford Process" is the one adopted by the company who exhibit these specimens. By this the sap and moisture contained in wood are evaporated by steam heat, and then withdrawn by powerful vacuum pumps. Wood is thus seasoned without hardening the fibers. Then hot creosote oil is admitted to the cylinder containing the wood, which, being in a vacuum, rapidly absorbs the oil. A pressure of 100 lbs. to the square inch is then applied until the wood has absorbed the requisite quantity of oil—about 8 lbs. to the cubic foot.

A large block of wood is shown that was partially creosoted, and thus fully protected from the *Teredo*, which had destroyed the rest of the block.

The Crosby Steam Gauge and Valve Company exhibit their improved steam gauges and adjustable pop safety valves. In the former the mechanism is of an uncomplicated character. The spring is hollow, and is so shaped and arranged, and the mechanism is such, that the vertical as well as the horizontal movement of its free ends is fully utilized. It thereby permits, it is claimed, the use of springs 100 per cent stronger than can be used in any other gauge, so preventing its setting under any pressure which may be indicated upon its dial. This gauge is very sensitive. There is no vibration of the pointer; no freezing. The adjustable pop safety valve is also of simple mechanism, and has few parts. The arrangement is such that it opens precisely at fixed working pressure; that it discharges all excess of steam above fixed working pressure; that it reduces the pressure rapidly upon opening; that it closes with the least possible loss of steam. One of the best features of this valve is that it never sticks on its seat.

Bean's Atmospheric Railroad Signal is in operation in the main building. The signal is worked at one side of the building, but the signal itself is placed in an elevated position on the other side. Its action is very simple. The motion of a flexible diaphragm, attached to a movable part of the railroad (as, for instance, a track instrument, drawbridge bolt, or switch lever), creates a pressure or exhaust of air in a quarter inch gas pipe connecting such lever, or other part, with the distant signal. The Old Colony and the Boston and Lowell railroads have adopted these atmospheric signals. Where the recent accident occurred on the Old Colony Railroad, we are informed, there were no signals of this description. The signal is claimed to be perfectly reliable, working automatically; every movement of the lever causes a corresponding movement of the signal. Any movement of the signal when out of sight, as at curves, or in fogs and storms, is as positively known to the switch or signal man as if in plain view. An electric connection is made between the two points, and every change of signal is announced at the station or switch post by the ringing of a bell. The electric wire runs through the pipe, which is embedded in the earth where practicable, thus being protected from storms or other disturbance. These signals have worked at distances of 1,000 to 2,000 feet reliably and efficiently during the winter and summer that they have been in operation, unaffected by atmospheric changes.

New Mechanical Inventions.

An improved Vehicle Wheel Hub has been patented by Mr. William H. Armor, of McKeesport, Pa. The object of this invention is to provide an improved construction of wheels, whereby the spokes may be inserted in the fellies and the hub without cutting the tire, and their inner ends may be kept tightly secured in the hub.

Mr. John A. Stephens, of Lecomte, La., has patented an improved Balanced Steam Valve. This invention relates to valves for steam engines which are balanced by the pressure of the steam. It is particularly intended for the throttle valves, to render the working of them easier, so that they require to operate them only power sufficient to overcome the friction of the parts.

Messrs. Hiram H. Hill and Frank Moorlen, of Augusta, Me., have patented an improved Steam Fire Engine. The object of this invention is to furnish a vertically working steam fire engine, so constructed that its action will be more steady and easy than engines constructed in the ordinary way. The improvement consists in a novel method of connecting the flywheel crank with the reciprocating pistons by means of a lever or half walking beam.

An improvement in Metallic Button Hole Stays for Boots and Shoes has been patented by Mr. Daniel Crane, of Seneca Falls, N. Y. The object of this invention is to furnish an improved device for preventing the button holes of button boots and shoes from tearing out or becoming frayed by the strain of the button hook and of the button.

Mr. James Parker, of Detroit, Mich., has patented an improved Guard for Car Axle Boxes, by which not only a considerable percentage of the oil lost with the present axle boxes is saved, but also the entrance of dust and the rapid wear of the journal and brass bearings prevented.

An improved Hose Nozzle has been patented by Mr. George F. Palmer, of Rochester, N. H. The object of this invention is to furnish, for hose of all kinds, an improved adjustable nozzle by which the quantity of water discharged may be regulated with great facility without changing the nozzles, and without impeding in the least the free passage of the water, whether a large or small stream is used.

The Stability of Modern Civilization.

In his address before the American Science Association, August 20, Professor Grote regarded the public press as at once a most efficient means for disseminating scientific knowledge and a surer basis for a permanent though ever advancing civilization than the world has ever before known.

"Those who have brought together the story of the ancient civilization of Greece have agreed with unanimity that the separation between the mass of the people and the intellectual portion became at length insurmountable, and finally led to national destruction. This makes for our view that it was to a defect or incompleteness in the machinery for the dissemination of knowledge that we must ascribe the dying out of the older states. To understand the new civilization, we must remember that it rests on a larger average intelligence, brought directly about by the discovery of the art of printing. There is then a distinct reason, a scientific ground, for the opinion that our present civilization rests upon a surer basis than did those which preceded it, and this we may safely bring forward in the cause of truth. For science is in danger always of being regarded as the enemy of the state, because it tends constantly to modify existing ideas. But if we can show the necessity for a constant modification of our ideas, arising out of our own constitution, then it may be seen to be unreasonable to defame those who follow the search for truth. And it being undoubtedly true, as Locke says, that of all the men we meet with, nine out of ten are what they are, good or evil, useful or not, by their education, we can see how wide reaching the effect of our improved basis of civilization must be upon us as a people, and how important it is to understand the real direction in which it works."

Recent Inventions.

An improvement in Carving Forks has been patented by Mr. Daniel Williams, of West Philadelphia, Pa. The object of this invention is to provide an attachment to carving forks for releasing from the fork any substance held by it.

Mr. Asa Brooks, of Hawleyton, N. Y., has devised an improved Machine for Calcimining, Painting and Whitewashing the ceilings of rooms. It is so constructed as to do the work in a rapid and workmanlike manner.

An improved Apparatus and Process for Annealing Glass has been patented by Mr. Auguste Weyer, of New York city. The object of this invention is to anneal glass in such a manner that a greater homogeneity is imparted to the same, which enables it to resist considerable changes of temperature without being liable to crack or break.

Messrs. Geraldo A. Beeman and John T. Mason, of Comanche, Tex., have patented an improved Pump having two barrels of different diameters, the larger being subjacent to the smaller, and each provided with a valved piston, said pistons being both secured to the same piston rod. It has a weight arranged to counterbalance the added weights of the water columns above the smaller and below the larger piston.

An improved Machine for Hulling, Scouring, and Cleaning Coffee has been patented by Mr. Patrick McAuliffe, of New York city. This invention relates to an improved machine by which coffee of all grades may be hulled, scoured, and cleaned, and different kinds and grades of coffee mixed and turned out with uniform appearance, and by which no annoyance from dust is experienced as the impurities are drawn off and collected. The machine has a continuous operation, as it receives the coffee at one end and discharges it at the opposite end in a uniform and marketable condition.

Messrs. Charles F. Bailey and George F. Perrenot, of Rockport, Tex., have patented an improved Machine for Ironing Clothes, pressing seams, fluting, etc. It is simple, convenient and effective.

An improvement in Bed Bottoms has been patented by Mr. Henry S. Cate, of Millerstown, Pa. This invention relates to improvements in the bed bottom for which letters patent were granted to the same inventor April 9, 1878, and numbered 202,149. It consists of an outer frame and a number of intermediate cross shaped pieces or links, that are connected longitudinally and transversely by elastic strips with each other, with the frame, and with longitudinal rods or slats interposed between the cross pieces. The cross pieces are raised by means of wood or leather blocks placed between them and the supporting strips, so as to raise them above the slats. End cross strips of the outer frame serve as guards in case of breakage.

An improvement in Burial Caskets has been patented by Mr. William J. Noble, of New York city. The coffin has a novel catch that engages with the latch of the sliding cover. The face glass is set in a frame and arranged to slide back beneath the cover.

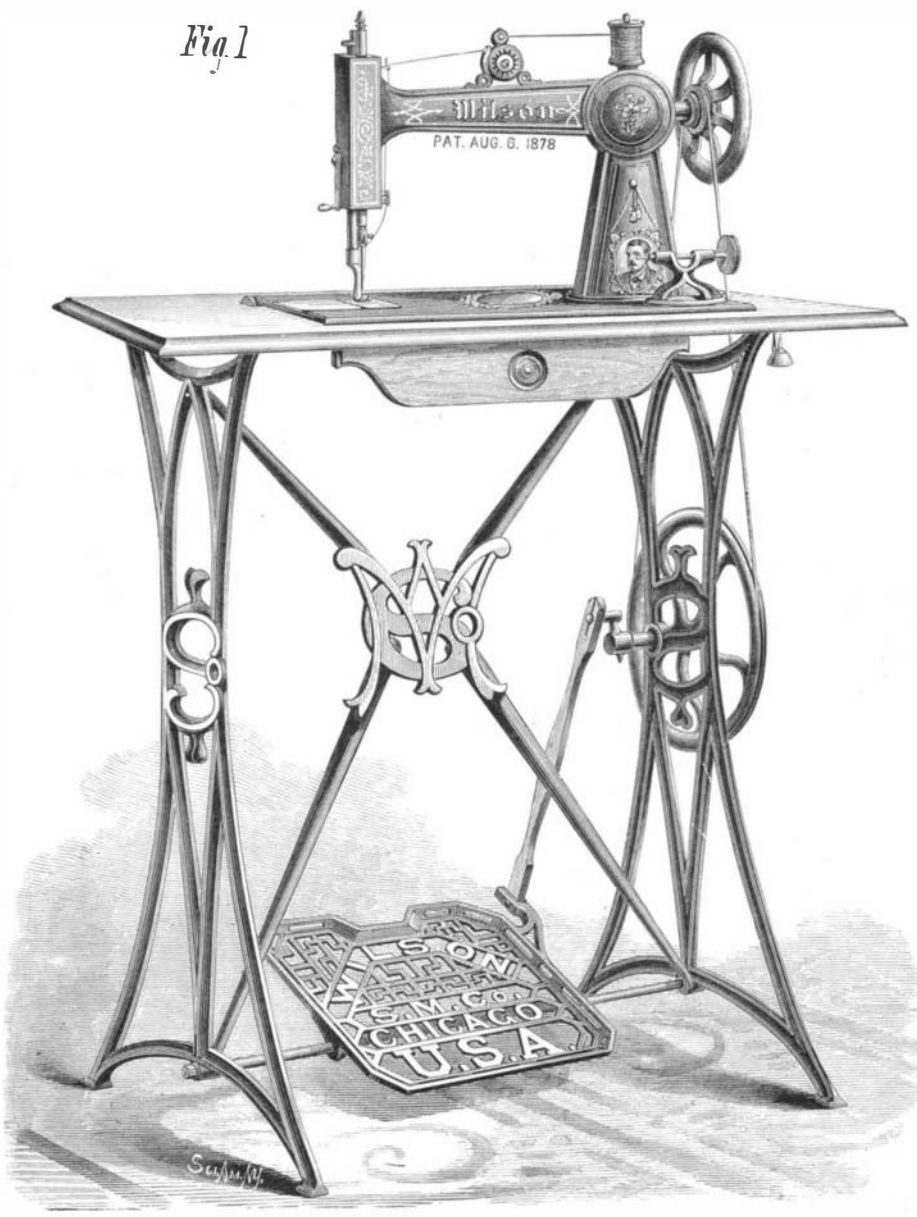
An improvement in Ash Sifters has been patented by Mr. William E. Brush, of New York city. This invention is an improvement in the class of ash sifters having a curved or sémicircular bottom, upon which they may be rocked, for the purpose of separating the ashes from the coal cinders.

New Ways to Use Iron Wanted.

In view of the plain fact that existing establishments for the production of iron and steel have a capacity far in excess of any probable demand likely to arise in the natural course of trade, the (London) *Iron* proposes a new policy for the iron trade. The business of iron masters, it argues, should be not merely to make iron, but to discover and devise new ways for using iron; and mention is made of a few instances in which a well directed effort to extend the use of iron and steel could not fail of success.

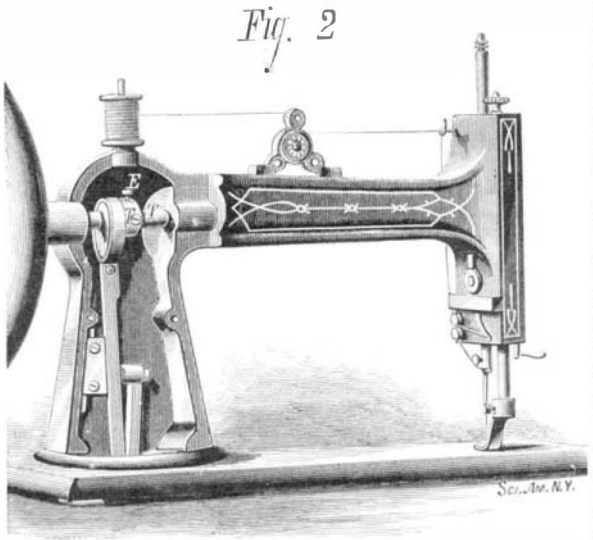
"Without dwelling on the far too limited employment of these metals in bridge and ship building purposes—for which their superiority is uncontested—one cannot fail to be struck with the great field offered by the permanent way of railways for the disposal of our surplus stocks. Mr. Wood's estimate that some forty millions of railway sleepers have to be replaced annually at a cost of over six millions sterling, is probably not far from correct. That a permanent way constructed wholly of iron or steel is at least equal, if not superior, to the existing compound system, has been demonstrated in India, Belgium, and Germany. With an economical mode of protecting the metallic sleepers from corrosion, the advantages would be still greater. Without implicitly adopting Mr. Wood's estimate that the railways would save three millions a year by the change, it cannot be doubted that it would be a highly beneficial one both for the companies and ironmasters. It is, moreover, a change which must inevitably come sooner or later, since wood is becoming yearly dearer and dearer; while there is hardly a civilized country which is not suffering—in deterioration of climate—from the destruction of timber, of which the demands of railway engineers are a prime cause. It will not be much longer endured that the preservation of a certain proportion of forest land, which is demanded alike in the interests of hygiene and agriculture, should be rendered impossible because the conservative instinct of engineers prefers continuing to use timber for purposes for which it is less well suited than iron. The enormous destruction of young trees for the supply of pit props might also be very materially lessened by the use of removable iron pillars in the many situations in which they can be successfully employed in mining.

Fig. 1



NEW WILSON SHUTTLE SEWING MACHINE.

Fig. 2



WILSON SEWING MACHINE—SIDE REMOVED.

"By the use of steel for the framework of railway carriages and trucks there would result a gain in strength, lightness, and durability; while the saving of life and property in accidents, by having cars which would present an enormous resistance to crushing, would alone justify the change. Architects are already using iron girders with some freedom, and with the experience they have thus gained of the use of metal in construction, it would require but little encouragement to induce them to adopt it much more largely in all positions where the maximum of strength with the minimum of bulk is sought. There is, however, a most singular prejudice against iron, very prevalent among architects, on the score of æsthetics. Now the truth is, that no material lends itself more readily to the most graceful and beautiful forms. Not only does its extraordinary strength enable cumbrous buttresses and bulky pillars to be dispensed with, and the widest spaces to be roofed with a single span, but, owing to the facility with which the most intricate designs may be reproduced by casting, cornice, frieze, and finial may be enriched with a luxuriance of ornament difficult of attainment by the worker in stone or wood. There is much room, too, for the increased use of iron for such purposes as fencing, the construction of outbuildings, for wheels, and telegraph posts, and a thousand minor outlets which it would be tedious to enumerate.

"While all are agreed that a vastly extended use of iron would be a matter of general advantage, are we to wait till consumers, retarded by the ponderous inertia of prejudice and ignorance, appreciate the fact in their own good time, or is it not allowable to accelerate a result so generally desirable by every legitimate means? We have had enough of masterly inactivity. The occasion is favorable for adopting a more progressive policy, which, if vigorously prosecuted, will certainly bear good fruit. Let the two bodies which represent the scientific (or technical) and the commercial interests of the iron trade appoint a Joint committee to draught a scheme for an association whose business it should be to extend the use of steel and iron. Some such body has already been formed in Belgium (though as yet it has shown few signs of life), and there is no reason why the movement should not be taken part in by the iron trade of all ironmaking countries, their interest being in this matter identical. The work of the association would consist in the collection of unimpeachable and carefully verified data as to the relative strength, durability, and cost of steel and iron as compared with wood, brick, and stone; to point out the particular directions in which the best results may be expected to follow from the substitution of the superior material for inferior ones, and to induce manufacturers generally to adopt definite sizes and patterns for the leading articles of manufacture, such as girders and columns, in lieu of the present perplexing variety, which is a relic of the days when standard gauges for screws and wire were not; to collect trustworthy information as to promising inventions tending to economy of make, and possibly to encourage judiciously the direction of invention into useful channels; above all, to give the greatest possible publicity to their recommendations and the facts on which they are founded. Such would be some of the functions that the new body could be called on to perform. By the adoption of such measures as this, we believe that such an impetus would be given to demand that the equilibrium so long destroyed would be speedily restored. The policy of *laissez-faire* has been tried; if a more vigorous policy fails of success, it will at least deserve it."

THE NEW WILSON OSCILLATING SHUTTLE SEWING MACHINE.

The sewing machine in its most perfect form is peculiarly an American manufacture. This industry, which has already attained such gigantic proportions in this country, is destined to increase, for our sewing machine manufacturers have the entire world as a market for their goods.

Among the few leading sewing machines, the Wilson as formerly constructed may undoubtedly be mentioned as one of the best. The new Wilson sewing machine, which is shown in perspective in Fig. 1, and in detail in the other engravings, and which is about to be placed upon the market, is remarkable for the peculiar combination of mechanism by which all of the movements required to make the stitch are effected by few and simple parts.

This machine is the result of years of experiment conducted by skilled workmen. We are advised that the Wilson Sewing Machine Company have a corps of ingenious and competent workmen constantly employed in improving the machine and devising new means and methods of manufacture, so that they may not only produce a machine of superior excellence, but may do it economically, so that both the manufacturer and the purchaser may share the benefits. Wherever a machine can be simplified without impairing its efficiency, it not only lessens the cost of manufacture, but it also increases its durability and facilitates its operation and management.

The Wilson Sewing Machine Company have in their new machine reduced the number of both moving and stationary