# Srimtific Ameritan. 

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

## Scientific ${ }^{\text {rim }}$ American, pobisgrd wrbily

At 123 Pulton Stroet $\mathrm{N} . \mathrm{Y}$. (Sun Buildinge.) by monn \& company. Azēts.
 4. (f. Courtenay. Charleston. S. W. Pease Cincinnati, p 1 cities and towns in the United States. Single copies of the paper are on sale at 211 the periodi
cal stores in this city. wrooklyn, and Jersey Citt. al stores in this city. irooklyn, and Jersey City.
 Direct Acting Pumping and Cornish Engines. As considerable has appeared in our columns relating to the Cornish Pumping Engine, the same question has lately excited no small amount of discussion on the other side of the Atlantic. A paper has been read on the subject before the Royal Scottish Society the subject before the Royal Scottish Society
of Arts, by D. Landale, in which he described a direct-acting pumping engine, which, since 1852, has been slowly making headway against the Cornish Engine, on account of its simplicity and cheapness. There are two kinds of this engine, both condensing, high-pressure, and expansive; one with a 40 -inch cylinder and 12 feet stroke, which is simply a Cornish engine turned upside down, the cylinder resting on a strong sole plate over the mouth of the shaft, and the piston-rod attached direct to the forcing set-pump rods. The air pump is small in diameter, with the same length of stroke as the engine, thus doing away with the ponderous beam, parallel motion, and heavy masonry of the cylinder pedestal, lever wall, and engine house, and obtaining any desirable length of stroke by merely adding to the length of the cylinder and piston-rod, thereby increasing the efficiency of the pumps, and making smaller ones do the same work. The second kind of engine is also inverted over the shaft, and secured and attached to its the shaft, and secured and attached to its
work in precisely the same way. It also uses high pressure steam expansively; but its peculiarity consists in there being a constant vacuum above the piston, both during the descent and ascent of the load. During a portion of the descent the piston is nearly in equilibrio, having a vacuum on both sides; that under being a partial, and the one above being about $121-2 \mathrm{lb}$. per square inch, or the common condenser vacuum. As the piston and load continue to descend against this vacuum, a self-acting valve shuts toward the piston, and a full vacuum is acquired by the time the piston has got to the lower end of the cylinder, thus giving a tension or extra pressure equal to 4 tuns on the 70 -inch cylinder at the moment when it was most required to at the moment when it was most required to
overcome the vis inertia. The steam valve is overcome the vis inertia. The steam valve is
then opened, and high steam admitted forthe up-stroke. There are only two double beat valves worked by the engine. The vacuum valve is self-acting, oblong, and hinged, working on the upper port of the cylinder.

Convenient Railroad State.
It seems of the ninety-one counties in Indiana the inhabitants of eighty can leave home in the morning, go to Indianopolis by railroad, attend to business there from two to eight hours, and return home the same evening.

## Polarized Light.

In the apparatus ream of the Smithsonian Institution, there is exhibited an immense instrument for showing the colors of polarized light. The arrangement of this instrument is the invention of Dr. Edmundson, of Baltimore, who has long been known to the scientific world. The instrument presents on a larger scale than perhaps they were ever before exhibited, the gorgeous colors of light.

## IMPROVEMENT IN PLATFORM SCALES.



Improved Platform Wcizhin: Scale ${ }^{\text {D }}$ Our engravings illustrate the platform scales of Messrs Strong \& Ross, Vergennes, Vt. Patented Jan. 15, 1856. Also patented in Europe.
In this invention, the long under bracing and levers generally required for platform scales, are dispensed with, rendering the pit in the ground unnecessary. The construction is also greatly simplified and cheapened. At each end of the platform there is a shaft, A. which is provided with short cranks, C. B B are the beams of the platform which rest upon the ends of the cranks, $C$, and consequently the weight upon the platform tend to turn shaft A. levers, $D$, extend from the shafts, $A$, and terminate in a sling, E , which connects with the scale beam, F, so that when A turns, no mat ter how slight its movement, the short end of scale beam E will be depressed; by putting on weights at the opposite end, the proper counterpoise will be obtained, and the correct weight of all articles placed on the platform ndicated.
Fig. 2 is an enlarged view of the connection between the ends of the platform beams $B$, and cranks, $C$. The end of beam B rests upon balls which are contained in a double cup-shaped piece, $\mathbf{G}$; the latter has a vertical projection, $\mathrm{G}^{\prime}$, which rests upon a knife edge, con crank C. H are studs projecting from

The Worcester (Mass.) Telegraph says :"Without intending to disparage in the least the capitalists of Worcester, we may truly say that our city owes its growth and present business prosperity to the intelligence and activity of her mechanics. In saying this we cannot be accused of slighting those of our citizens who are enabled to live in well arranged mansions and to fare sumptuously every day, because most of these built the foundation of their present affluence in the machine shops of our city; most of them have in their day, toiled with their own hands, and started their fortunes by the sweat of their
the side frames, $I$; the studs support shafts, the proper balance is obtained. L is a screw A, upon knife edges, $a$. The ends of these studs, $\mathrm{H}^{\prime}$, are swiveled and turn on pivots, $e$, at right angles to the knife edges $a$; this arrangement permits the knife edges to adjust themselves by partial rotation upon the swivels, $\mathrm{H}^{\prime}$, and thus a perfect bearing is insured ; perfect accuracy in the fit and finish is also rendered unnecessary, expense reduced, \&c. $J$ are pins in frames, $I$, to prevent the ends of beams, $B$, from lifting out of place.
This method of connection gives free movement to the parts, in all directions, without friction, and yet keeps them all in proper place; the use of check rods is also unnecessary, for the platform does not rest rigidly upon the knife edges, and therefore there can be no direct shock or wear upon them.
When a very heavy load is placed upon the platform, its beams are likely to bend, and in common scales this bending pu:ls the levers, causing them to vibrate more than the true weight. The use of balls under the ends of the platform beams, totally obviates this objection.
The beam, $F$, has a sliding poise, $K$, of the ernier kind, graduated so that the fractions indicated by the beam may be easily read. This is very convenient in use, for only one peration is necessary to determine the weight any load, viz., to slide the poise, M, until
own brow. What they have accomplished others now laboring in our busy mechanical hives of industry will accomplish; and hunreds of young men who are now employed at the bench or vise, will, at no distant day, become the proprietors of the shops where they re now emp.oyed, and reside, perhaps, in the very mansions now occupied by their employrs. Such is "manifest destiny," and such is the inevitable result of well-applied industry, and honest, upright conduct. So much for the mechanics of Worcester."

Canse of the Inundations in France
At a late meeting of the Academy of
weight for the finer divisions of fractionssuch as ounces, half ounces, \&c.
We saw the accuracy of this invention put to a severe test not long since. The capacity of the scales on trial was six tuns, a load consisting of a tun and a half of iron was rolled upon one corner, and then changed from place to place; at all points in which it was placed, the scale exhibited the same weight with scarce a variation of half an ounce; a copper penny thrown upon the platform, when thus balanced, would destroy the poise, so accurate was the apparatus.
The principles of this weighing machine are adapted to the construction of scales of the largest and longest description. For railroad purposes it may be arranged in elongated form, extending several hundred feet, so as to weigh a number of cars, with their burdens, at once.
It is extremely portable, rests flat on the ground, may be taken up and put down any where, or packed in small compass for distant transportation. Its construction is quite simple, and its manufacture very economical. The invention contains other points of interest, but our limited space prevents their special notice.
Address theinventors, as above, for further information.
which he attributed the recent destructive inundations in that country to a sirocco from Africa. He asserted that this sirocco passed over the sea, causing rapid evaporation, and that it carried the moist clouds to France, where they were condensed and fell on the mountains in heavy showers, melting the nows, and causing heavy torrents to flow down upon the plains, thus swelling the rivers to overflowing.

Good Speed.
On the 10th ult., the morning train bound east on the New York Central Railroad, ran from Buffalo to Syracuse, nearly 150 miles in

[Reported Officially for the Scientific American.]
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## The Paison Strychitinc.

This drug, which has lately become so notorious for destroying the lives of human be-ings-as in the case of the infamous Dr. Paler, recently executed in England-is a most deadly organic poison. A dog has been killed with the sixth part of a grain of it, and a human being with less. When introduced into the stomach it acts with fearful energy, causing lock-jaw immediately, violent spasms, and death in a few minutes. It is odorless, but so intensely bitter as to be perceptible to the taste when one part is diluted in a million parts of water. The composition of strychnia is carbon 44 , hydrogen 24 , oxygen 4 , nitrogen 2 equivalents. It is colorless, and forms soluble crystalizable salts. It is an alkaline base, and is extracted principally from the Strychnos nux vomica. The tree from which it is obseveral parts of the Estate size, and grows in of Ceylon. Its fuit are large orat he islan berries, the pulp of which is the favorite of many birds. The seeds contain the deadly poison. They are flat and round, about a inch in diameter, and gray in color. These seeds were used as a medicine, and as a po:son, by the Hindoos, long before they wer known in Europe. Many of the natives Hindostan often use it as people use opium They commence with taking the eighth of nut a day, and gradually increase their allowance to an entire nut, which would be about twenty grains. If they eat it directly before or after food, no unpleasant effects are produced; but if they neglect this precaution, spasms are the result
The bark of the tree is also poisonous, an from its resemblance to Angustura or Cuspa ria bark, a tonic medicine imported from South America, caused a great deal of alarm and ex citement in Germany, in the early part of this century, by being mixed with that bark. No
poison, but some chemists have attained to great skill in detecting it, when administered as a poison. The following is Dr. Thompson's method of detecting the one-thousandth part of a grain :-
Having placed a drop of strong sulphuric acid on a piece of glass, add to it a small quantity of the suspected substance, and stir the wtole together, so as to favor solution; then sprinkle over the mixture a little powdered bichromate of potash, and gently move a glass rod through the fluid. If strychnia be present, a violet color of considerable beauty will be almostimmediately produced which, after a few minutes, will fade into a reddish yellow, but may be renewed by the addition of more bichromate, so long as any strychnia remains undestroyed in the mixture. In this way the thousandeh part of a grain of that alkaloid may be made to yield a very decisive indication. The points to be noticed are, that sulphuric acid alone produces no apparent effect, end that the action begins at once round each particle of the bichromate, so that if the glass be held in a vertical position, streams of a violet colored fluid may be seen to flow from each particle; and if at this time the whole be slowly stirred, the entire bulk of the fuid will speedily assume the same characteristic tint.


The Coroner's Jury, in the case of the terrible railroad accident on the North Pennsylvania Railroad, mentioned by us last week is, that "the collision was caused by the crim inal negligence of Alfred Hoppel, the conduc tor of the excursion train, who carelessly and negligently run his train beyond the side ling at Edgehill."
This conductor is now in jail. The total number of the dead by this accident is 66 ; wounded. over a hundred. Will any person be punished for the criminal negligence which caused this accident? Let the people of Penn sylvania answer.

More American Printing Presses for England The Illustrated London News announces tha it has contracted for one of Hoe's printing presses, and the London Times has also or dered a very large one.
At the Complimentary Supper given by the proprietor of the New York Sun, a few years ago, to Col. Hoe, when the first large press was put up in the Sun Establishment, James, the Novelist, who was present, said, "West ward Hoe" had become a byeword, but "Eastward Hoe" would soon supersede it He said this in reference to a demand tha would yet arise for such presses in Europe His prediction is now fulfilling.

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About 50 miles of the above cable has bee recovered by the Telegraph Co. They fitted out a brig from Cape Breton, with fifty men and a powerful capstan, and they have fished up the above length of it, leaving thirty miles ying in the ocean. With $\$ 50,000$ of insur ance recdived on it in London, the Company have recovered nearly all they had paid out for it.

## Bust of Columibue

Mr. A. Herbemont, U. S. Consul at Genoa taly, possesses the only bust of Columbus now in the native city of the great discoverer. Mr. Herbemont found a bust in the Campidoglio, at Rome, which was the only one in I: a l , except one at Naples. From the former he procured two casts, one of which was sent to the South Carolina College Library, at Coumbia, and the other is in the U.S. Consulate Office at Genoa.

Death of an Artist
Thomas Doughty, a distinguished Ameri can landscape painter, died in this city on the 23rd inst. His last days were passed in comparative poverty, and he has left a destitute family.
A portion of the rock over which the water falls at the Falls of St. Anthony, gave way for a distance of about fourteen feet from the Minneapolis side, on the 6th July. The break does not diminish the hight of the fall any, but removes that portion of it some distance further up stream.

