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**LIST OF PATENT CLAIMS**  
Issued from the United States Patent Office.

FOR THE WEEK ENDING JANUARY 8, 1851.

To J. M. C. Armeby, of Worcester, Mass., for improvement in Candlesticks.

I claim casting the fly-wheel of the corn sheller solid with the feeding wheel, so as to bring it between the two bearings of said wheel, as herein before set forth.

[Some mistake of the Patent Office here.]

To David Baird, of New York, N. Y., for improvement in Spring Mattresses for invalids.

I claim, first, the employment of the end stays, having rule joints, allowing a limited range of motion and standing in a bracing position, substantially in the manner and for the purpose set forth.

Second, I claim the centre supports for rendering that part of the mattress permanent when desired.

To Thomas Bennet, of New York, N. Y., for improvement in Rotary Pumps.

I claim the arrangement of the curved water ways in the annular space above the fan or paddle, when substantially as described, in combination with the rotating fan or paddle wheel, substantially as described, and for the purpose specified.

And I also claim the self-adapting valves, substantially as described, and governing the apertures leading to the annular space above, in combination with the rotating fan or paddle wheels, and the curved water ways, substantially in the manner and for the purpose specified.

To E. B. Bigelow, of Clintonville, Mass., for improvement in Looms for weaving Tapestry Carpets with parti-colored warp.

I claim regulating the delivery of giving out of one or more warps or chains, by the separate tension of each, substantially as specified, in combination with a ground or controlling warp, which determines the length of the cloth warp, regulated by its tension and controlled by a break, or an equivalent thereof, when the lathe beats up, substantially as specified.

I also claim the employment of fingers, moving or vibrating independently of the lathe, substantially as and for the purpose specified.

To Francis Draper, of East Cambridge, Mass., for improvement in Fountain Inkstands.

I claim the arrangement for cutting off the communication between the cap and the main fountain of ink, by means of a layer of cork, or other similar substance, in the bottom of said fountain, and a cork, or other similar stopper, fitted on the bottom of the cup tube, or the lower end of said extended cup tube pressing against said layer, as set forth, in combination with the above specified arrangement, the inner cylinder in which said stopper moves as a piston, by which the air is more effectually excluded from the main fountain of ink.

To Wm. Maguire, of Cincinnati, Ohio, for improvement in machines for Jointing Staves.

I claim the arrangement, substantially as herein described, of a circular rest, having a sliding motion to and fro, in the plane of its axis, and having, around its perimeter, catches for the retention of the stave during the process of jointing, and rotating the distance from stave to stave, at every forward stroke, and held fast for the action of the rotating jointers upon the stave at every return stroke, the jointer and circular rest being so arranged as to impart, at the same time, to the stave

edge, any given bevel and taper, according to the size and bilge of the cask.

To S. W. Marston, New York, N. Y., for improved Fly-tumbler Lock for fire-arms.

I claim the fly-tumbler arranged and combined with respect to the sear and the cock, in the manner and for the purposes set forth.

To Edward Neely, of Savannah, Mo., for improvement in Grass Harvesters.

I claim the manner herein described, of suspending the cutter ring from the wheel by means of straps, or other yielding material, for the purpose herein described.

I also claim the combination of the cutters, bevelled cutter ring, and straps, for the purpose of raising the cutter ring over any obstruction coming against the edge of the knife, as herein described.

I also claim the manner of arranging the guide beard, standard, arm, and strap, secured as described, for the purpose of guiding the machine and allowing the parts to yield to a sudden stopping of the machine, or to irregularities in the ground, for the purpose and in the manner described.

To Jacob Neff, of Philadelphia, Pa., for improvement in Electro-Magnetic Engines.

I claim the insulated discs, in combination with the platina points, to act in concert with the magnetic wheels, in manner and form, and for the purposes described.

To Cunningham H. Pennington, of Rome, Ga., for improved arrangement of arches in bridge-trusses.—Ante-dated Dec. 9, 1850.

I claim the method herein described, of combining and arranging the several arches of a bridge, so as to make each arch alternately the upright and inverted arch, as it passes from one span of the bridge to another, and vice versa, when one set of arches have their remotest distance from each other, and their greatest sustaining point, directly over and under the points, when the other set of arches are changing from upright to inverted arches, or vice versa.

To James Shields, of New York, N. Y., and Samuel Pierce, of Troy, N. Y., for improvement in Coal Stoves.

We claim the method, substantially as herein described, of supplying currents of atmospheric air to the products of the combustion, at or near the thread leading from the fire chamber to the flues, in combination with what is known as Nott's fire-chamber, having the draught throat leading therefrom, between the top and the grate, the upper part of the fire pot may constitute a feeder or chamber of preparation, substantially in the manner and for the purpose specified.

To S. R. Simpson, of Springfield, Ohio, for improved Parallel Vise.

I claim the attaching the lower end of the moving jaw of the vise to a block that is attached to and moves with the end of the screw, in the manner and for the purpose described.

To A. L. Simpson, of Durham, N. H., for improvement in Ox Yokes.

I claim arranging in the beam of the yoke two draft staples, some six inches apart, in lieu of one at the centre and the combination or use therewith, of a branch chain of proper length, connected to the main draft chain, at a proper distance from the beam, and the adjustable hook, for modifying the length of the branch chain, as specified and for the purpose set forth.

To James Warner, of Springfield, Mass., for improved means for revolving the breeches of repeating fire-arms.

I claim the cranked shaft operated by the tumbler, having its axis of vibration in the line, or nearly so, with the axis of rotation of the cylinder, substantially in the manner set forth.

R. G. Westacott, of Worcester, Mass., (assignor to R. G. Westacott, E. L. & N. K. Lombard, of Boston, Mass., or elsewhere) for improvement in the manufacture of Caviar.

I claim salting the roe or ova, whereby extraneous matters are separated, the same consisting in suffering it to stand in pickle, or a strong saline solution, or until it undergoes a process by which ova, and such extraneous matters separate from one another, the former rising to the surface of the pickle, while the latter falls to the bottom of it.

And I also claim the combination of the male sturgeon oil, as above mentioned, with

the salted ova, for the purpose of improving the manufacture thereof, as specified.

For the Scientific American.  
**Mechanical Principles.—No. 3.**

**ACTION AND RE-ACTION.**—Perpetual motion has always been a favorite subject with tyros in mechanical principles, and the subject has lately been renewed in the shape of Mr. Paine's gas light. There is no connection, however, between strictly mechanical action and a combination of mechanical and chemical action: those who make such comparisons do not understand the subject; for, viewed in the light in which Mr. Paine's light has been called by a gentleman "perpetual motion," the steam engine, as it now stands, is just as much so. Why? because one man can dig as much coal in one day as will supply an engine of 100 horse power for the same time. The steam engine, therefore, gives out a far greater mechanical result than the labor required to produce the elements and feed them to the engine to call forth its powers. Strictly speaking, there can be no such thing as perpetual mechanical motion. Why? because "action and re-action are equal and opposed to one another." Inertia is simply a principle of matter, or quality in all bodies, by which they can neither generate nor destroy motion, it therefore follows that when bodies act upon one another, in any way whatever, the total quantity of motion, in a given direction, after the action takes place, must be the same as before it; for, if it were otherwise, some motion would be produced by the action of the bodies, which would contradict the principle that they are inert. Mechanical action does not mean any inherent active principle in bodies, but the effect of motion in bodies. If two balls of glass were projected opposite to one another in a tube, both balls being 12 pounds, with a velocity of 100 feet per second, the momentum of each would be  $12 \times 100 = 1200$ , therefore the momentum, at the point of contact, where they meet, would be 2,400. This would shatter them both to pieces. If one, in motion, struck the other when stationary, the ball, in all likelihood, would not be broken, for the momentum exerted would be only one half. The second ball, therefore, if it could be carried along with the moving one, would be reduced in velocity, but the amount of moving matter would be doubled, consequently the quantity of motion (momentum) would be the same, thus proving that action and re-action are equal. Momentum is the quantity of matter multiplied into its velocity. A ball of 12 pounds weight moving at a velocity of 10,000 feet per second has double the quantity of motion (momentum) that a ball of the same weight has, when moving with a velocity of only 5,000 feet per second. A body of 5 pounds weight, moving at a velocity of 10,000 feet per second ( $5 \times 10,000 = 50,000$ ) has more momentum, or force, than 50 pounds moving only at the rate of 500 feet per second, ( $50 \times 500 = 25,000$ ), but 50 lbs., moving at the rate of 1,000 feet per second, has as much momentum as 5 pounds moving at the rate of 10,000 feet per second. A piece of tin on a mandril, if made to revolve at a great velocity, will cut through iron, because it has so much of a superior momentum as to counterbalance its defect in hardness, as compared with the iron. A round ball, without a cutting edge upon it, when shot from a cannon, will pierce through iron plates, with the greatest ease. The steam pressure on a piston, if the area is 100 inches, and the pressure 100 lbs on the square inch, is the same as the weight of a body amounting to  $100 \times 1000 = 100,000$  pounds, and the velocity of the piston at 300 feet per second, will give an amount of momentum equal to  $10,000 \times 300 = 3,000,000$ , lifted one foot per second, or a horse power of 5,454 6.11, for a horse power, is a unit of 33,000 lifted one foot high per minute. If we say 300 feet per minute, we have a horse power 60 times less, or 90 10.11 horse power. When the velocity in feet and the weight are multiplied into one another, the resultant may be called the whole weight moved one foot in the time specified.

MACLAURIN.

MESSRS. EDITORS.—In last week's Scientific

American it was stated that "a ball of lead, 2 inches diameter, will fall faster than a ball of lead one inch." This I think, is incorrect and contradictory to the known laws of gravitation. As the earth's attraction acts separately and equally on every particle of matter, without regard to the nature or species of the body, it follows that all bodies must be moved with the same velocity. If two equal particles of matter be placed at a certain distance above the surface of the earth, they will fall in parallel lines and with exactly the same speed, because the earth attracts them equally,—in the same manner a thousand particles would fall with equal velocities. Now, these circumstances will in no wise be changed if those 1000 particles, instead of existing separately, be aggregated into two solid masses, one consisting of 990 particles, and the other of 10. We shall thus have a heavy body and a light one, and, according to our reasoning, they must fall to the earth with the same speed.

W. A. BLACK.

Philadelphia, Jan. 6, 1851.

For the Scientific American.

**Belts and Pulleys.**

In Vol. 6, page 53, of the Scientific American, is an inquiry in regard to the use of thick and thin belts to drive machinery. I have found by experiment, that if equal weights were suspended upon opposite sides of the same pulley, by straps of equal weight, but of unequal thickness, the weight suspended by the thick strap would preponderate, and which seems evident, from the consideration that the thick belt carries the weight further from the centre of motion—the inside of the belt, next to the pulley, not being strained as much by the weight as the outside, in consequence of the bending of the strap, thereby increasing the strain on the outside, while it is proportionably diminished on the inside, and, in effect, increasing the size of the pulley by so much of the thickness of the strap as is not strained. It therefore becomes obvious that, as the pulley is enlarged by this means, a less number of revolutions will be produced by a thick belt than by a thin one, provided, however, that both belts have the same velocity; but, as it is evident that if the driven pulley is enlarged, the driving pulley must also be enlarged by the same means, consequently the velocity of the belt alone will be increased, while that of the two pulleys remains the same.

E. M. CHAFFEE.

New Haven, Dec. 23, 1850.

**Coal for Gas.**

The London "Journal of Gas Lighting," for last November, has an elaborate article on the comparative lighting powers of different kinds of coal, and the respective values of their residuary products. From this article is compiled the following table. Five cubic feet per hour of the gas produced by each description of coal, it must be understood, gives a light equal to the number of candles stated in the first column of figures. The second column shows to what proportion of the cost of the coal the residuary products are equivalent.

	CANDLES.	PER CENT.
Scotch Cannel,	20 to 30	5 to 20
Newcastle Cannel,	22 to 25	30
Wigan Cannel,	20 to 23	20 to 25
Newcastle Coking Coal,	11 to 15	50 to 55
Derbyshire do.	12 to 15	40 to 45
Yorkshire do.	10 to 13	45 to 50
Lancashire do.	10 to 12	45 to 50
Cumberland do.	10 to 12	35 to 40
Gloucestershire do.	10 to 12	30 to 35
Cheshire do.	10 to 12	20 to 25
Somersetshire do.	9 to 10	40 to 45
Staffordshire do.	9 to 10	35 to 40
South Wales and Dean Forest do.	8 to 9	45 to 50

This table may teach the public how fallacious it is to suppose that gas can be sold at the same price, with the same profit, all over the world. The lighting power of the coal—the value of the residuary products—the extent of consumption—must all be taken into consideration. We must also bear in mind that the residuary products of the same coal vary in value according to locality.

The Philadelphians have given a grand fete to Capt. Mathews of the "City of Glasgow."

