

NEW HAY PRESS.

The great volume of hay in its natural state renders it very difficult of transport, so that where vast quantities are required for the forage of armies or the wants of large industrial establishments, it becomes necessary to reduce its bulk very considerably. This, however, must be done judiciously, and above all uniformly; for if a certain pressure, determined by experience, be exceeded in any portion of the mass, the nutritious juices are expressed, and the hay rendered comparatively valueless. It is found that hay cannot be compressed like cotton by the application of one direct pressure, but that the consolidation must be effected by two separate operations, one for placing the particles in as close proximity as possible with a slight degree of pressure, and the other to give the final squeeze for reducing the bulk into as small a compass as may be desired. This has generally been effected by tossing the hay into cubical cases, where it is trodden down by men's feet before the final pressure is applied; but this method is open to many objections. The hay is bruised and broken by this rough

treatment; no uniformity can be secured in the packing; and the plan enables unscrupulous dealers to fill in the interior of the bale with a damaged or inferior article. Besides this, the form of the bales is very inconvenient, so that they require four men to transport them from place to place.

The hay press exhibited in action by Mr. Th. Pilter, of Paris, at the Cattle and Implement Show under the auspices of the French Minister of Agriculture and Commerce, is improved by him from an American model, and patented in England and France. The hay, thrown on to a platform, is delivered continuously in small quantities up to a circular plate, and passes through two narrow slits, into which it is uniformly fed by two revolving cones, which impart to it a corkscrew motion. The hay is, in fact, roughly spun into a double threaded screw of very fine pitch, and forced onward with gentle pressure until a sufficient quantity has been collected to form a cylindrical bale of the weight desired. A pressure of about 6 cwt. to the cubic yard is then applied, giving the density which is found most desirable; a pressure of 8 cwt. to the square yard may, however, be given if required. The bale is then bound by two steel wires, crossing one another in a longitudinal direction; they are previously looped at each end, and are fastened by simply inserting in the loops a curved link like a small belt hook before it is flattened. On the pressure being relieved the mass slightly expands, stretching the wires; and the bale falls out of the press, a solid uniform cylinder, 2 feet 1½ inches in diameter, which may be rolled along by one man. A bale weighing from 2 to 2½ cwt. is found most convenient, and for this a power of only three horses is required.

A perspective view, engraved from a photograph of the press exhibited at Paris, is given in Fig. 1. The machine rests upon a pair of wooden carriages, similar to those of a wagon, connected by stout longitudinal frames of angle iron; it is, therefore, easily moved to wherever required for work. The main shaft extends the whole length of the frames, and is supported in bearings, one at each end of the right hand frame or that removed from the point of view in the engraving. A pulley keyed on to the end of this shaft receives motion, by a belt, from a horse gear, portable engine, or any source of power. This shaft carries three spur pinions of equal diameter, arranged quite near the bearings, two at the front end and one, not visi-

ble in the engraving, at the back; they all run loose, but are capable of being made fast by friction clutches. When none of the pinions are in gear the main shaft only revolves. When the two hindmost pinions are both made fast on the shaft, they cause the two large spur wheels of equal diameter, arranged along the center line of the machine, to revolve together. That nearest the front end is fast on the second shaft,

which, by means of a pair of miter pinions, rotates a transverse crank shaft, actuating the shakers. There are four of these shakers with rake teeth, two on each side of a central division (not shown) for keeping separate the two streams of hay fed in by the two cones. This division is made movable for permitting the wires to be inserted for binding the bales. Having described the principal parts of the appliance, we

will now proceed to give an account of the operation of compressing the hay and forming the bales. Both the large spur wheels are thrown into gear, so that the screw, nut, and head revolve together. The hay is then thrown by forks on to the platform by two men, one on each side, and is carried on by the shakers to the back plate, where it is drawn uniformly through narrow rectangular apertures by the revolving cones. The head is at first close up to the back end; but the pressure exerted by the cones, introducing the hay, forces it gradually forward; and teeth are attached to the head for preventing the hay from slipping round it. In order to cause sufficient resistance of the head on the square bar, the latter is provided with a brake

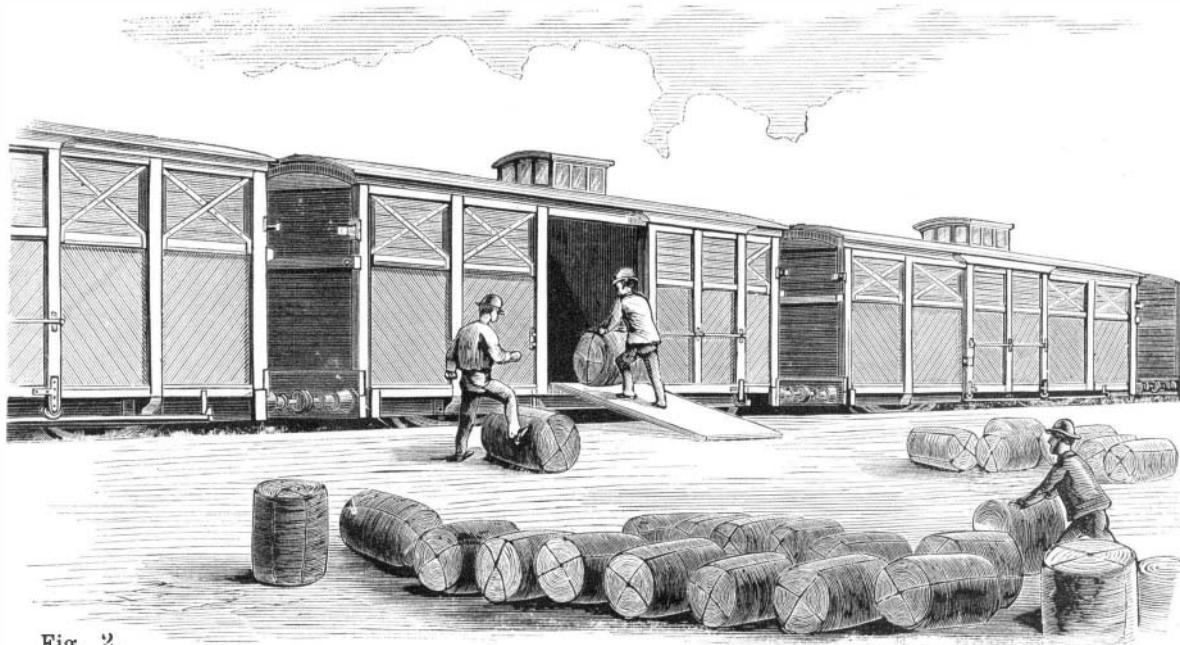


Fig. 2.

LOADING HAY CYLINDERS.

which is hollow, and forms the nut of a screw. The other is merely a ring having a flange cast on to it, which is carried by three friction rollers; it has, however, a couple of ribs, cast on the inside of the ring, which fit into notches in the circular head of the press, so that they revolve as one piece when the hay is fed in at the back end. This head is guided by two T irons bolted to the back plate and attached to a collar carrying arms at the front end. The head is also bolted to a square bar of wrought iron, which slides through the center of the screw, and passes out at the front end. When both the spur wheels are in gear, the second shaft, forming

screw, which is turned as tight as experience shows to be desirable. When a sufficient quantity of hay has been fed in to form the weight of bale required, the back pinion, spur wheel, and cones are thrown out of gear, and the large spur wheel at the front end kept in gear; as the boss of this wheel forms a nut to the screw, it causes the latter to advance and drive back the head until it has given the hay the amount of compression desired. The bale is then bound by the two steel wires as described above; the double lever clutch throws out the larger spur wheel, and throws in the smaller, thus bringing back the screw; and the bale falls out, ready to be rolled away wherever required.

The operation of the machine is one of the simplest character, requiring only a power of three horses, the labor of two men, and from three to five minutes of time, according to the size of the bale.

Fig. 2 shows the method of loading the bales into railway cars; and Fig. 3 a plan of the car with the arrangement of the bales as stowed away. It will be evident that this new hay press possesses considerable advantages over those which have preceded it.—Iron.

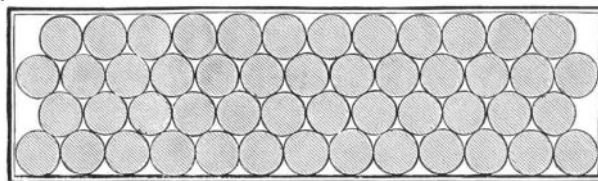


Fig. 3.

HAY PRESS.

the nut, and its screw revolve together; but when the back wheel is stationary, the revolution of the nut causes the screw to advance, forcing the head toward the hinder end. For bringing back the screw a smaller spur wheel, the boss of which also forms a nut, is made to revolve in the contrary direction by means of an idle wheel or carrier; and the front spur pinion is thrown into gear by a double clutch at the front end. A bevel wheel cast on to the annular spur wheel at the back end (not seen in the engraving) turns the cones, which are centered in the ribbed plate, and also takes into a bevel pinion, giving motion to a short longitudinal shaft,

Beautiful Black Color for Bronze.
A strong concentrated thin solution of nitrate of silver is required for this purpose. It should be mixed with an equal solution of nitrate of copper, and well shaken together. The pieces which require coloring are dipped into this solution and left for a short time. When taken out, they should be equally heated till the required black color makes its appearance.

Economy of Co-operation.
In his report as Commissioner to the Paris Exhibition Ex-Governor Howard, of Rhode Island, speaks of Switzerland as the cheapest cloth-making country in the world. This is due, he says, to the fact that the Swiss factories are run largely on the co-operative plan. Mills are family concerns, and owners and operative live and work together. The hands themselves are very often property owners and have a general interest in the prosperity of the community. As the result, there is a more general spirit of contentment among the Swiss factory workers than any where else in the world. Wages are very low.

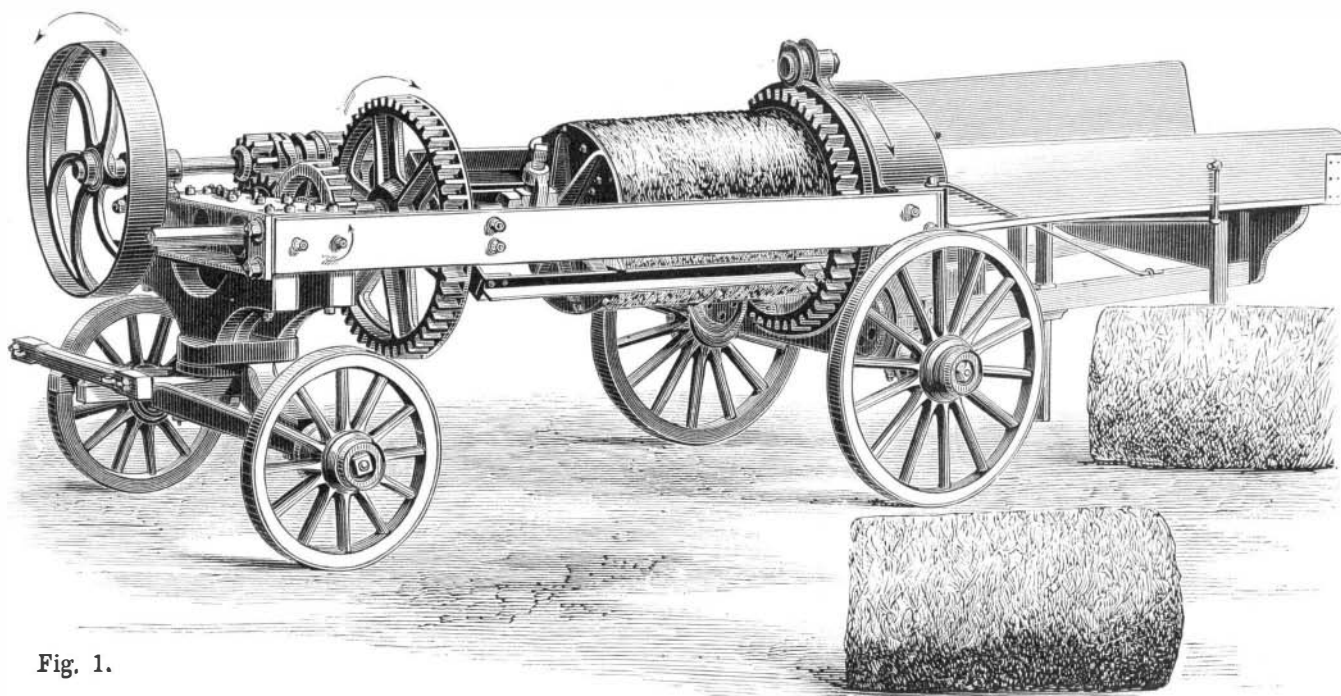


Fig. 1.

PILTER'S ROTARY HAY PRESS.

New American Industries.

The *Grocer*, in summing up the new sources of wealth in this country, and alluding to the anxiety of foreign producers at our rapid strides in producing nearly all the most important staples formerly imported, says that six years ago cream of tartar was imported from France to the extent of 6,000,000 lb. yearly, but so successfully has the manufacture of it in this country been carried on, that last year not a single pound was imported. Notwithstanding that the crude materials have at present to be imported, the price of the manufactured article has been reduced from 32 cents per pound, the rate for the French article here, to 23 and 24 cents per pound for the American production. France and England formerly sent us annually 500,000 lb. of tartaric acid, while the importation for the last fiscal year was 183 lb. England formerly monopolized our market for citric acid to the extent of 250,000 lb. annually and at the rate of \$1.30 per pound, while last year 27,018 lb. were imported and sold at the same price as the American article, 57 cents per pound. At present the lime juice from which citric acid is made has to be imported, but it could easily be produced from fruits grown in Florida, if only sufficient energy were put into the work. If the lemon and lime growers of the South can be induced to prepare the lime juice, the entire production and manufacture of citric acid will be kept in this country, saving hundreds of thousands of dollars annually and developing another great industry. Borax was formerly brought from England at the rate of from 600,000 to 1,000,000 lb. every year. Owing to the development of borax mines in Nevada, this importation has largely fallen off, and the report for the last fiscal year showed only 3,492 lb., and the price of the refined article, which is now prepared in this city, is only 8 to 9 cents per pound, when formerly it was 35 cents per pound, England being now among the buyers where she was the principal seller, both of the crude and refined product.

The production of fruit sirups has heretofore been entirely in the hands of the French. The long time required to transfer these goods from France to South America and the West Indies, where they are largely used, and the natural advantages of the country, induced our New York merchants to enter into competition with the European markets for the production of fruit sirups. The experiment has proved successful, and sirups of a far richer flavor have been produced much cheaper and have met with approval in the tropics. The success of the experiment bids fair to bring to the United States a large trade, and retain in the United States millions of dollars that has previously gone to other nations.

IMPROVED SNOW FLANGER.

We give herewith an engraving of an improved apparatus recently patented by Mr. David A. Cox, of Pine Bush, N. Y., for removing snow from the inner side of the track rail to make way for the flanges of the car wheels. This device, although quite simple, is said to be very effective. We are informed that it has been subjected to a practical test during the past winter, which has demonstrated its utility to the satisfaction of the railroad that has adopted it, as well as to the inventor.

The beam, A, of the car truck is mortised to receive the scrapers, B, which are slotted at their upper ends and held in place by a pin. The upper ends of the scrapers are pressed by the springs, C. The scrapers are flexible, and their lower ends are provided with a projection that extends nearly to the flange of the rail.

As the car progresses the snow is thrown outside of the track, and the path of the wheel flanges is readily cleared. The scraper being flexible yields to any rigid obstruction. The device may be applied to one or more of the trucks on the train, and it operates when the car is drawn in either direction.

Instead of using the slotted scraper the one shown in the foreground having a T-shaped head may be employed, but its action would be the same as that already described.

A Large Meteorite Found.

About 5 o'clock in the afternoon of May 10, a large meteor was seen to fall at the edge of a ravine near Estherville, Emmett county, Iowa, making a hole 12 feet in diameter and about 6 feet deep. S. E. Bemis writes to the *Chicago Tribune* that search parties had found numerous pieces, varying in size from 1 to 8 ounces, also four pieces about 4 lb., and one weighing 3 lb. and 2 ounces; but the largest size was found bedded 8 feet in blue clay, and fully 14 feet from the surface. Its weight is 431 lb., and its size 2 feet long by 1½ wide, and one or so foot thick, with ragged or uneven surface. It is composed, apparently, of nearly pure metal, a piece of which has been made into a ring. It makes a very pretty ring, resembling silver somewhat, but a trifle darker in color.

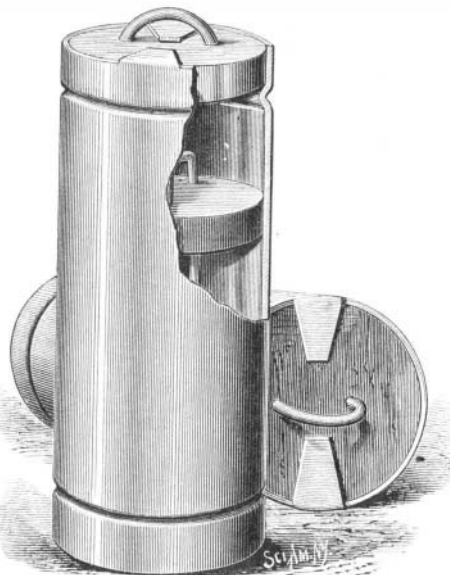
Not Pleuro-Pneumonia.

Professor Williams, of the New Veterinary College, Gayfield, Edinburgh, Scotland, has decided that the American cattle slaughtered at Liverpool were not suffering from contagious pleuro-pneumonia, as the veterinary officers of the Privy Council asserted. The lungs of such cattle having been submitted to him for examination, Professor Williams

says that in none of them were there any of the signs of contagious pleuro-pneumonia, but all presented evidences of capillary bronchitis and collapses of certain lobules of the lungs of recent origin. In none of the lungs were there any traces of pneumonia or of pleuritis. He is of the opinion that the disease originated during transit. He adds that the above mentioned portions of lungs have been examined by Dr. Hamilton, Pathologist to the Royal Infirmary and Demonstrator of Morbid Anatomy; Dr. Young, Professor of Physiology; Mr. Vaughan, Professor of Anatomy; Mr. Kitchen, Professor of Materia Medica and Therapeutics, all of the New Veterinary College of Edinburgh, and others, all of whom agree with him as to the nature of the disease and are ready to indorse his opinion.

NEW SAMPLE CASE.

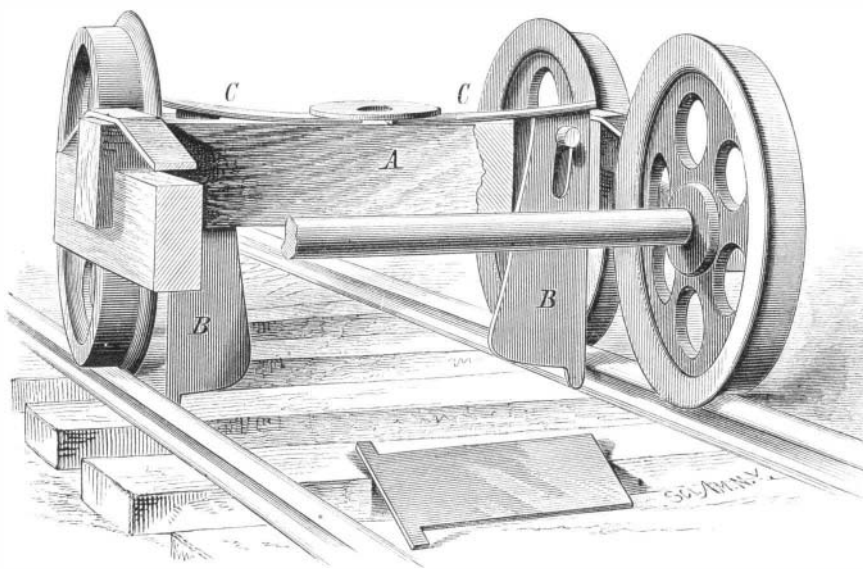
The accompanying engraving shows an improved case for sampling, holding, or conveying goods of various kinds. It

**DAVIS' SAMPLE CASE.**

seems especially adapted to the use of millers and others dealing in grain or flour.

It consists of a sheet metal tube having near each end indented grooves, that in reverse form ribs or shoulders on the inside of the tube, which serve as seats for the stoppers. The stoppers are of sufficient thickness to reach from the rib to the end of the tube, and are retained in place by lips formed at the end of the tube, which are bent down after the package is filled.

The tube is provided with one or more partitions or diaphragms of cork or other suitable material, which divide the package into two or more compartments, so that two or more different samples may be carried. The stoppers at the ends

**COX'S SNOW FLANGER.**

of the package are provided with handles to facilitate their removal.

This improved sample package was recently patented by Mr. M. R. Davis, of Jackson, Mich., from whom further information may be obtained.

Growth of the Petroleum Business in the Pennsylvania Oil Fields from June, 1872, to April, 1879.

The amount of crude petroleum produced in the month of June, 1872, was 506,130 barrels. The amount of crude oil held in stock at that time in the producing regions was 1,010,302 barrels. The number of producing wells in June, 1872, was 4,144. The average daily production per well was 3 9-10 barrels. The sales of crude on board of cars in June, 1872, were from \$3.80 to \$4.10 per barrel.

The amount of crude produced in the month of April, 1879, was 1,507,950 barrels. The amount of crude held in stock at that time was 6,666,611 barrels. The number of producing wells in April, 1879, was 10,782. The average

daily production per well was 4 6-10 barrels. The sales of crude oil certificates in June, 1872, were from 73¼ cents to 83¼ cents per barrel.

From the above exhibit the following results appear:

1. That the production of the Pennsylvania oil fields has increased about 200 per cent.
2. That the stock of crude held in the producing region has increased over 600 per cent.
3. That the number of producing wells has increased about 160 per cent.
4. That the daily average production per well has increased 0.7 per cent.
5. That the average price of crude in April, 1879, was nearly 300 per cent less than in June, 1872.

From the above results the deduction of over production is inevitable.—*Stowell's Petroleum Reporter.*

RECENT AMERICAN PATENTS.

Messrs. D. M. Hurlburt and C. R. Slocum, of Hornellsville, N. Y., have patented an improved umbrella drip cup, which consists in a collar with a flexible rim and having attached to it a flexible bag. The drippings run into the flaring portion of the collar and from thence into the flexible bag.

Messrs. Joseph Conly and Jonas B. Wise, of Sharon, Wis., have patented an improved refrigerating building for the preservation of fresh meat and other substances to be kept cool. It consists in a peculiar arrangement of double walls, partitions, slides, etc., which cannot be clearly described without an engraving.

A horn tobacco box, consisting of two similar sections connected by flanges and rivets, and provided with a sliding cover, has been patented by Mr. Hermann Arnold, of Elizabeth, N. J.

A novel toy windwheel, consisting of a spring hammer, a corrugated bell or gong, and a metallic windwheel, attached to a handle and arranged so that the rotation of the wheel will ring the gong, has been patented by Mr. Joseph L. M. Du Four, of Bound Brook, N. J.

Mr. Frank Donaldson, of New York city, has invented an improved device to be inserted in or attached to house doors for convenience of those supplying and those receiving milk. The device holds the pitcher and the money or ticket, indicates the amount of milk required, and has a small locked door which can be opened only by the milkman, who carries a funnel adapted to the apparatus, which he inserts through the door when he desires to fill the pitcher.

An improved edging tool for lathe working has been patented by Mr. Genas B. Putnam, of Thomaston, Me. The invention consists in a flat cutting blade fitted to a handle and carrying an adjustable gauge arm, to which is attached a gauge plate that acts as a guide for the knife.

An improved means for attaching urns to stoves has been patented by Mr. Cornelius Fuller, of Somerset, Mass. It consists in a horizontally bent arm hinged to one side of the stove by a vertical pin. This arm has an eye through which passes the stem portion of the urn.

Messrs. D. W. and H. Johns and Henry Embs, of New Albany, Ind., have patented an improved machine for making ax-polls. In this machine the ax-polls are made by the rolling process, the iron bar being first bent into a V-shape and the eye formed; the ends or flanges are then closed by stationary dies as the poll comes from the roll.

An improved apparatus for utilizing waste gases of distillation in refining petroleum has been patented by Mr. Henry E. Parson, of New York city. This invention is designed to utilize the gases that are formed in the process of distilling petroleum after the oil leaves the condensing coil.

An improved clothes pounder, patented by Mr. William D. Middleton, of Elkhart, Ind., consists in the combination with a conical dasher of a perforated cylinder, a piston, and a spring, arranged so that air is forced through the clothes and through the water, facilitating the cleansing of the clothes.

In picking cotton long sacks are used, which are dragged on the ground by the pickers. When filled these sacks drag heavily and are worn out rapidly. An improved cotton sack protector, which may be easily attached to or removed from the sack, and which will obviate the difficulty referred to, has been patented by Mr. David W. Bullock, of Tarborough, N. C.

Mr. James S. Brady, of Cliftondale, N. Y., has patented an improvement in dampers for stoves and furnaces, by which the draught is controlled automatically. The invention depends for its action on the expansion of the stove and pipe by an increase of heat.

Mr. Theodore Beckerman, of Henry, Ill., has recently patented a windmill which has several novel features. The spokes of the wheel and the rods and stays are made of gas pipe to secure strength, lightness, and durability. The hub is of cast iron and the sails are of sheet iron or wood. It is provided with an effective automatic governing device, consisting of a weighted lever and connections, by means of which the sails may be kept full in a moderate wind and turned more or less under a varying wind pressure, so that a uniform speed will be maintained under all working conditions. The peculiar construction of the mill admits of the use of large sails without necessarily using heavy working parts.