

## New Inventions.

## Applying the Waste Gas of Blast Furnaces.

Within the past few years an immense saving of fuel has been effected in some iron-smelting establishments, by conducting the waste heat of the blast furnaces under boilers to generate steam for driving the machinery employed.

The venerable Dr. Nott, of Union College, Schenectady, N. Y., was the first inventor who attempted to save the waste heat of blast furnaces, and apply it usefully, and his invention has now come into very general use. Hitherto, however, the application of the waste gases of such furnaces has been defective, owing to the difficulty of making the hot gases descend from the top of the blast stack under steam boilers placed on the ground, thus rendering the system almost inapplicable to iron works built on level ground. This difficulty has been entirely obviated by the improvement in blast furnaces for which a patent has been issued this week to Henry Weissenborn, of this city, whose claim will be found on another page.

By Mr. Weissenborn's invention the hot gases of the blast furnace are stored up in a reserve gas chamber, and made to descend easily from the top of the blast furnace under boilers placed on level ground. This improvement is not merely theoretically good; it has been practically and successfully applied at the Euroka Iron Works, Wyandotte, Mich. In a letter before us from D. Webb, the Superintendent of the Works, and Joseph H. Harris, chief founder, it is stated that the various blast furnaces in New York, Massachusetts, Connecticut, and Pennsylvania were visited to obtain the best plan for building the furnaces, and Mr. Weissenborn's was at last selected as being the most feasible for the situation, it being level ground.

The furnace was commenced in 1854, but many persons who professed to be acquainted with furnaces, pronounced the project impracticable during its erection, but when finished it operated perfectly, and with the most satisfactory results. The letter says:—"The hot gas came down without extra fans under the boilers, and into the hot blast, and during an experimental trial of twenty-two days, at no time was all the waste heat used for generating the steam and heating the blast." Thus the whole cost of fuel for driving the steam engine in these Iron Works has been entirely saved by this improvement. Every invention which economises waste in fuel is of vast consequence to the iron interests of our country.

## Raking Attachment to Reapers.

The accompanying illustrations are a perspective view (figure 1) and a side elevation (figure 2) of an improved raking attachment for reapers, for which a patent was issued to James H. Thompson of Newark, N. J., on the sixth of last month (January, 1857.)

The rake has an intermittent vibrating and rotary motion, whereby it rakes off the cut grain in gavels, in a very simple and ingenious manner.

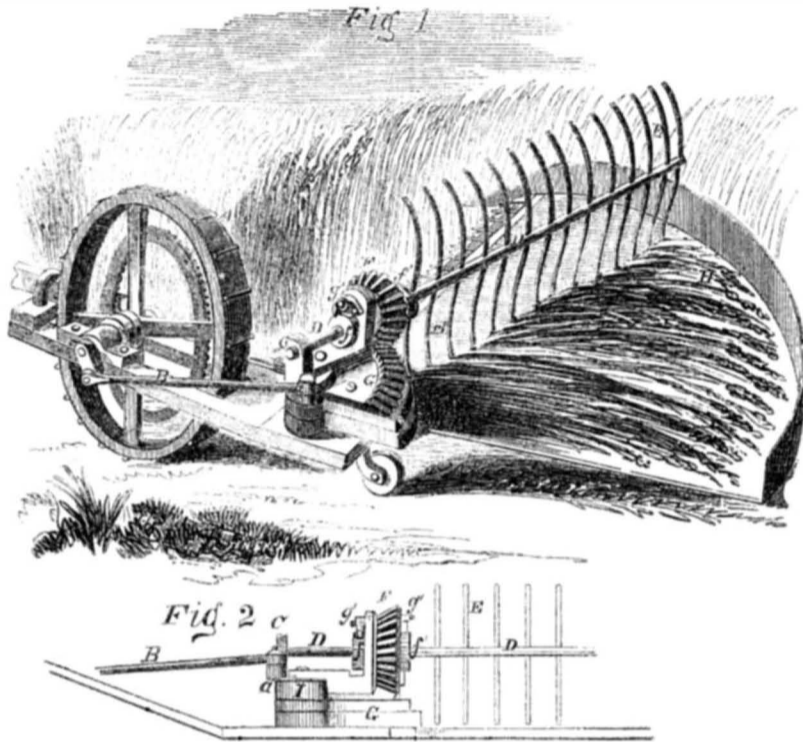
A is the driving wheel of the machine; on the outer end of its axle is a crank. B is the connecting rod, which is united by a crank pin, a, to the vibrating frame, C; this frame has two lugs, which form supports and bearing, S, to the spindle or shaft, D, of the rake; E E are the curved fingers, or teeth, of the rake; f f are two circular ratchets keyed to a shaft, D. Each of these has two notches on its periphery. g' g' are two spring pawls secured on fulcrum pins; one is secured to the inner standard or support of the small sliding frame, C; the other is connected to the face of the bevel pinion, F, which is loose on the rake shaft. G is a segment of a circular rack with bevel teeth; it is bolted on a fixed block. The bevel pinion, F, gears in this rack, and receives a semi-rotary motion, back and forth, while being moved on it, with the vibrating frame C. H is the platform to receive the cut grain; it is of a semi-circular form, and has a side curb. The cutting knives are formed and operated in the usual manner. The vibrating frame, C, is secured on a center to a fixed guide block, I, below.

As the machine is drawn forward, the con-

necting rod, B, imparts a back-and-forth motion to the frame, C; it swings, as it were, on its vertical center pin in the block. The ratchets, f f, being secured to the shaft, D, of the rake; the pawls, g' g', according as they are thrown out, and take into the notches of these ratchets, give the desired motions to the rake. When the rake is at the front end of the platform to rake back the grain, the front pawl, g', takes into a notch, f; and as it is secured

on the support of the frame, C, it holds the ratchet firmly, while the frame is moved backwards, thus allowing the bevel wheel, F, to rotate loosely on shaft D, which, being moved back on the bevel rack, G, the rake shaft is prevented from revolving. It is thus that the rake, with its teeth down, as shown, moves directly back to the hind part of the platform, gathering the grain into a gavel in its circular sweep, and discharging it at the

## RAKING ATTACHMENT OF REAPERS.



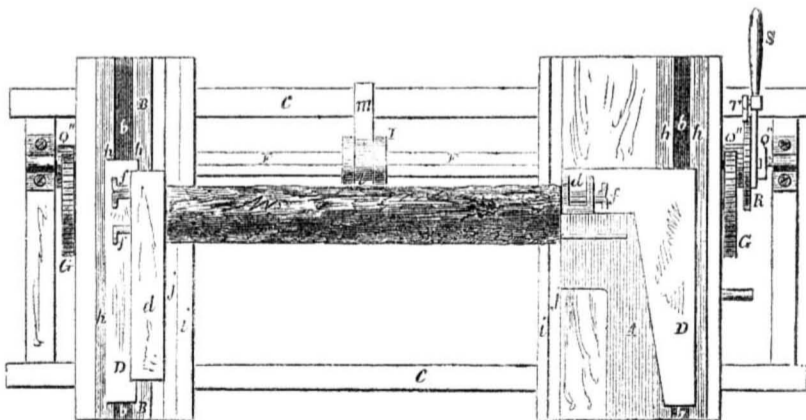
back end. Whenever the gavel is discharged, the pawl, g', on the bevel wheel, is brought round to catch at that instant into the notch in the ratchet, f', therefore, when the bevel wheel commences to revolve forward in returning, this pawl, gearing the ratchet to the wheel, gives a partial rotation to the rake which lifts its teeth above the platform, and then, when it carries the rake to the front end, it has revolved sufficiently to depress its teeth down to the platform, to rake backwards; the pawl, g', on the support of the frame C, then takes into the ratchet, f, and holds the

rake shaft firm while the rake is moving back, as has been described. The rake shaft has, therefore, a continuous intermittent rotary motion forward, in conjunction, with its reciprocating motion.

This improvement in the raking attachment of reapers appears to be excellent in every respect. The motions are correctly timed, and directed to effect the objects of raking in a complete manner, and by very simple but very ingeniously arranged devices.

More information may be obtained by addressing Mr. Thompson as above.

## COMBINED HEAD AND TAIL BLOCKS FOR SAW MILLS.



This illustration is a plan view of an improvement in combining and operating the slides of the blocks of a saw mill, whereby with one motion of the lever the two slides are moved with ease, simultaneously to feed the log the exact and equal distance transversely to the saw for each new cut.

A is the head block, and B the tail block, with a log represented as dogged between them, ready for sawing a new board, the saw being supposed to be hung and moving in the slot right the head of the log. c c are side timbers of the carriage which feeds the log forward to the saw; they support the head and tail blocks, which are moved on them to adjust them for logs of different lengths.

D D are metal slides to which the log is dogged. Those slides have racks secured on their under sides, and they move in grooves, b b; two pinions (one for each rack), on a single long shaft extending under the head and tail blocks, take into these racks and move them. These racks are cast separate

from the slides, and can be easily and cheaply repaired or changed.

d d are posts cast on the top of the slides; the ends of the log are firmly dogged to these by the pins, f f, which are inserted through openings in the posts, d d, and forced into the ends of the logs. There are hooks underneath on the slides, which hook under parallel ribs, fastened to the head and tail blocks, thus keeping the slides firm on the blocks. The log thus secured on the carriage between the head and tail blocks may or may not touch the parallel ways, i i.

F is a horizontal shaft running under the head and tail blocks with its bearings in cross timbers in the carriage. It connects the head and tail blocks, and passes through two short hollow shafts or tubes attached to those blocks. I is a supporting box pulley for sustaining shaft F, when it is of great length, and whilst sawing long logs. This shaft passes through an opening in its center; it has a groove in its periphery to receive a semi-cir-

cular collar, l, which rests upon a sliding arm, m, attached to one of the side timbers of the carriage and can be slid to the right or left to move the supporting pulley. This support prevents the shaft sagging, and also from breaking if a log should fall down upon it.

G G are two cog wheels secured on two short transverse shafts. Q Q, on which there are pinions (not seen) for engaging in the racks on the under sides of the slides, D D and by which the log is set. On the two short hollow shafts mentioned—one secured to each head and tail block—are pinions, Q' Q', into which the large cog wheels, G G, gear. R is a ratchet dividing wheel on the axle of the pinion Q'. T is a pawl which takes into this ratchet wheel. S is a setting lever—the pawl T is attached to it. This lever is loose on the shaft of pinion Q', the shaft being its fulcrum in setting the log. By actuating the lever, S, motion is communicated simultaneously to the slides of the head and tail blocks through the shaft, F, by the pinions on the under side of the slides, D D. The log remains on the head and tail blocks until sawed up into boards, and the sawed boards remain on the blocks in single stack till removed in a body when the mill is stopped.

The two wheels, G G, are of the same size, with equal cogs and pitch; the two outside pinions, Q', are of equal size, cogs and pitch; the two pinions on shaft F, under the racks of slides, D D, are of equal size and pitch, and so are the racks. The ratchet or scale wheel R, is spaced off with 32 equal cogs 5/8 of an inch pitch. The wheels and pinions are of such a size and relationship to one another that the slides, D D, which feed the log to the saw, are moved one-eighth of an inch for each cog of the wheel, R, moved by the lever, S, and held in place by the pawl, T. This result may be varied by altering the gearing but preserving the combination.

This improvement dispenses with the labor of a tail Sawyer entirely; the Sawyer sets both ends of the log with the lever, S, in an instant, and without leaving the back of the saw. By setting both ends of the log accurately together, boards are sawed exactly of an equal thickness throughout, which effects a great saving of lumber, as all boards of unequal thickness are held to be defective, and almost useless.

This improvement is adapted for circular as well as up-and-down saw mills. The logs are not hollowed out to sit on the log way, consequently no thick and thin combs are made at the center of the log. The arrangement of the lever, S, and the gearing, enables one man to exercise great power with ease in shifting the log.

A patent was granted to J. S. Snyder, of Lancaster, Ohio, for this invention, on the 5th of February, 1856, and the patentee informs us that it has already come into extensive use in Ohio, and has received first premiums at the late State Fairs of Ohio, Michigan, Virginia, and Pennsylvania. It is a labor and lumber-saving improvement. More information may be obtained by letter addressed to Mr. Snyder.

## Iodurated Glycerine in Skin Diseases.

This preparation is recommended by Dr. Gage, of New Hampshire, and is made by dissolving one part of iodide of potassium in two parts of glycerine, and turning this liquid upon one part of iodine, which is thus completely dissolved. This solution has the advantage over alcoholic solutions of not drying. By this means the surfaces to which it is applied remain supple, and the action and absorption of the iodine remain for a long time. In employing it, the diseased parts to which the solution has been applied, are covered by paper of gutta percha, to prevent evaporation of the iodine.

[The above is from the *Druggists' Circular and Chemical Gazette*, published in this city—it appears to be a good recipe. Dr. Dixon, of London, author of an able work on diseases of the eye, recommends iodine in cases of chronic ophthalmia, and asserts that the best method of applying it is to the outside of the eyelid. The above preparation of iodine and glycerine, is excellent for applying the iodine to the skin to prevent its rapid evaporation.]