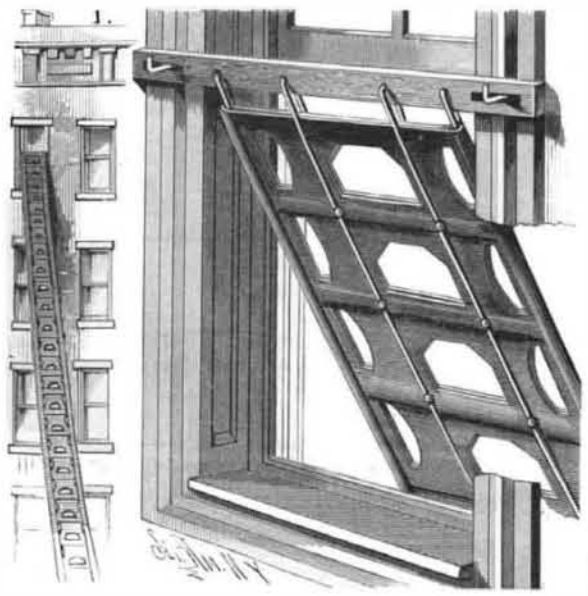
A FLEXIBLE LADDER FIRE ESCAPE.

Two pieces of canvas, or a single folded piece, are stitched transversely to form pockets to receive cross bars. The canvas is then stitched along its side edges to form passages for the side ropes. Near the sides are formed hand openings, and just over the cross bars in the center are foot openings. Along both sides of the ladder are placed ropes, which are secured to the canvas by stitching, and to the bars by rivets or staples. When the ladder is to be used as a fire escape, one end is attached to a cross bar of wood or iron, having slots made in it to receive hooks secured to the casing of the window. For further security, hooks or grapnels may be secured to the ends of the ladder for anchoring the lower end to the ground, and for attaching the upper end to any convenient object within the room. The ladder is to be secured on the inside of the window at the top of the lower sash, so that persons can step upon it from the window sill and descend on the inner side to the ground. It is made in sections, in order that any desired length can be obtained. Constructed in this manner the ladder is cheap and strong, and, being flexible, can be rolled up so as to occupy but little space, while it can be quickly adjusted when needed as a fire escape.

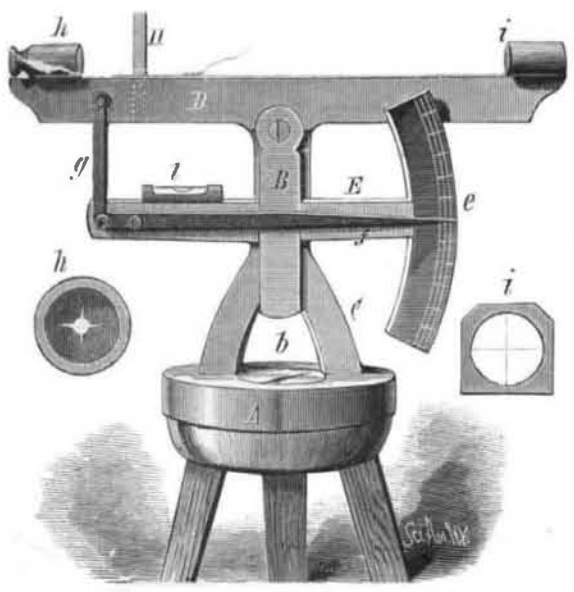


WRIGHT'S FLEXIBLE LADDER FIRE ESCAPE.

This invention has been patented by Mr. Edward P. Wright, of Portland, Oregon.

LEVELING INSTRUMENT.

In a recess in the base, A, which is pivoted upon the top of the tripod, is fitted a compass for use in obtaining right angles. Attached to the base is the standard, C, pivoted to one side of which is the bar, D. Mortised into the bar is the hanger, B, held by the same pivot screw that secures the bar to the standard, so that both parts can swing independently. The bar, E, is attached to the hanger so as to form side arms, one of which carries a scale bar, *e*, while to the other end is pivoted a pointer, *f*, that is connected by a link, *g*, to the top bar. This bar carries front and rear sight tubes, *h i*, the latter of which is fitted with crossed wires, and the former with an eye piece consisting of a disk of metal with a central hole and radial notches. Where a centrally apertured disk was used without the notches, the central part of the aperture, with respect to the crossed wires, was more difficult to determine, as the horizontal and vertical central lines of the apertures had to be imagined, whereas, by this construction, they are plainly indicated by the notches. The bar, D, is also provided with a rod, H, for use in obtaining perpendiculars.



MUNFORD'S LEVELING INSTRUMENT.

The instrument being planted, the hanger is turned to level the bar, E, which is determined by placing a pocket level on the bar, as shown at *l*. The end of the pointer, *f*, is then brought to the zero point on the scale and the bar, D, thus moved to the level. If a line is to be run with a rise or fall, the pointer will be correspondingly adjusted to the scale, which, being properly proportioned to the adjustable parts of the instrument, may also be used for measuring altitudes and distances.

This invention has been patented by Mr. Wm. H. Munford, of Anna, Ohio.

Scale Hardness of Metals.

The following is a scale of hardness in use in the laboratory of the Technical High School at Prague, composed of eighteen metallic substances, arranged in ascending order from the softest to the hardest:

1. Pure soft lead. 2. Pure tin. 3. Pure hard lead. 4. Pure annealed copper. 5. Cast fine copper. 6. Soft bearing metal (copper, 85, tin, 10; zinc, 5). 7. Cast iron (annealed). 8. Fibrous wrought iron. 9. Fine grained light gray cast iron. 10. Strengthened cast iron (melted with 10 per cent of wrought turnings. 11 Soft ingot iron, with 0·15 per cent carbon (will not harden). 12. Steel, with 0·45 per cent carbon (not hardened). 13. Steel, with 0·96 per cent carbon (not hardened). 14. Crucible cast steel, hardened and tempered, blue. 15. Crucible steel, hardened and tempered, violet to orange yellow. 16. Crucible steel, hardened and tempered, straw yellow. 17. Hard bearing metal (copper, 83; zinc, 17). 18. Crucible steel, glass hard.

The test is made by drawing a cylindrical piece with a conical point along a polished surface of the metal to be tested. In the case described, that of a bronze used for the cross head guide of a locomotive, the point, when loaded with five kilogrammes, was drawn six times through a distance of three centimeters. Under these conditions the points of the number below five in the scale were blunted without marking the surface; with Nos. 5 and 6 neither point nor surface was abraded; but No. 7, while being slightly worn on the point, began to scratch the surface. The hardness was, therefore, that of pure copper or soft bronze. The absolute tensile resistance was found to be 2,051·7 kilogrammes per square centimeter, while that of copper is 1,920 kilogrammes per square centimeter, and that of the bronze, No. 6, is 2,300 per square centimeter, thus showing an intimate relation between the strength and hardness of similar metallic compounds.

The Pneumatic Postal System of Paris.

The pneumatic system in Paris has recently been extended to the suburbs, and a very important service will shortly be opened by the postal authorities. This system has cost upward of a million francs for the laying of the pipes and the erection of the appliances. The longest distance between any two points in the system is 11,000 meters (about seven miles), and the uniform charge has been fixed at three pence for the delivery of a letter within one hour after its receipt. Compared with either the London postal or telegraph system, the facilities thus placed within the reach of Parisians are far greater.

GRAVITY FRICTION CLUTCH.

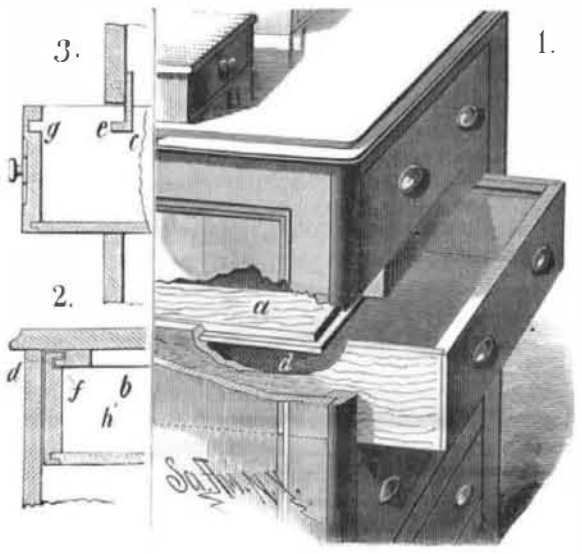
The object of the invention recently patented, herewith illustrated, is to provide a clutch for a mowing machine—or any other machine requiring a clutch—that will be noiseless and will take up all lost motion, in order that the knives may begin to operate the instant the wheels move, thus preventing the machine from clogging or leaving any grass standing. It is also designed for use upon horse rakes, sewing machines, etc.; when used upon the former, it causes both wheels to begin working at the same time, thereby obviating the jerking of the shafts against the horse, as in the case with a pawl-and-ratchet device. The disk, C, is recessed inside, and has a hub formed with a set screw, by means of which it may be rigidly secured to the shaft. The disk, B, is formed with a cam, B′, upon its inner face. Neatly but loosely fitting the recessed inside of the disk are the disk segments, E. When the disk, C, is revolved in the direction of the arrow, the eccentric hub, B′, binds against the segments, E, and the loose disk, B, is revolved in the same direction. When the disk, C, is moved in the opposite direction, the segments will not bind, but be carried around in the disk.

Figs. 3 and 4 show the same idea differently carried out. The circular plate is provided with a triangular-shaped hub formed of three eccentric arcs and three tangents, the latter meeting the arcs at the centers of the sides of the triangle. The recessed disk carries three disk segments, which bind against the triangular hub when revolved in one direction, and which are carried around when the direction of revolution is reversed. These clutches will not exceed in expense the ordinary pawl-and-ratchet, and are durable and effective in operation.

Additional particulars may be obtained by addressing the inventor, Mr. Anson D. Simpson, of Niverville, N. Y.

DUST COVER FOR DRAWERS.

The covers, *a*, *c*, are made to wholly or partly close the top of the drawers by tongues, *d*, *e*, on which corresponding groves, *f*, *g*, of the box sides and front ends will close when the drawers are shoved back into their cases, the covers being attached to the cases so as to remain stationary when the drawers are moved. The covers may close the whole of the drawers, as shown in Fig. 1, or only close with the front end, as in Fig. 3 The latter device may be easily attached to the front board of drawers in use, and is a simple angle strip having the tongue, *e*, suspended suitably for closing in the groove, *g*, which may be readily made in the front end of the drawer. These covers may be solid boards of the whole width of the drawer, or they may consist of a frame, Fig. 2, which will, when attached to the case, serve the same purpose, and as well as if solid. Constructed in this manner the drawers of a bureau, desk, or counter may be tightly closed so as to exclude the dust.

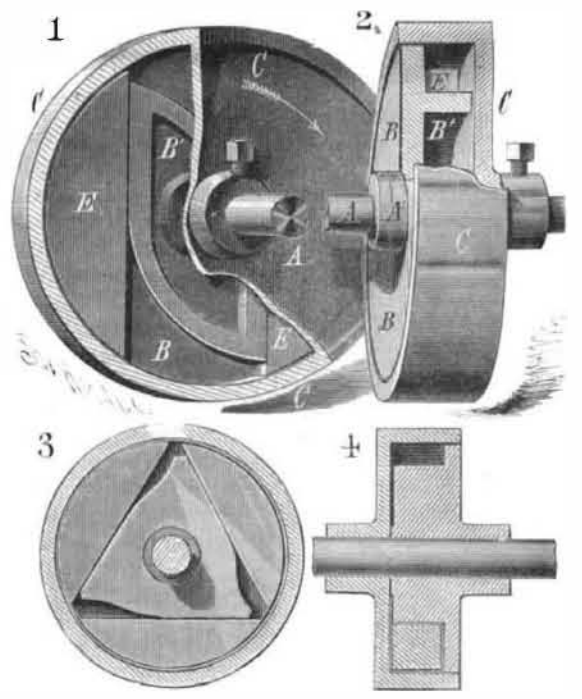


HAMILTON'S DUST COVERS FOR DRAWERS.

This invention has been patented by Mr. Alfred J. Hamilton, of Beaverton, Oregon.

Good Wool.

The production of a first class fleece of wool cannot be accomplished by a novice. It requires, in the first place, a well bred sheep, and then care in feeding and handling through all the stages of growth, and very great care in handling the fleece after it leaves the sheep's back. No matter how well bred a sheep may be, nor how good a fleece it naturally has, unless it is properly treated, its wool will be unmerchantable. Many think it does not matter how the sheep is kept, the fleece will grow just the same, and be as nice as the fleece on a well fed and sheltered animal. It would be well for these men if they would compare their clip of wool with those of some of their neighbors who treat their sheep the way they should, giving them plenty to eat, and sheltering them from all storms. They will find the wool softer, more even, and better matted, so that it makes nicer looking fleeces.—*National Stockman.*



SIMPSON'S GRAVITY FRICTION CLUTCH.

Depression in the Copper Industry.

The price of copper is now so ruinously low that the miners in some parts of the country are closing their works. Seven and a quarter cents a pound on the spot has been received. Lake Superior copper, the best in market, is worth in New York eleven and a half cents.