

**Improved Harvester and Raking Apparatus.**

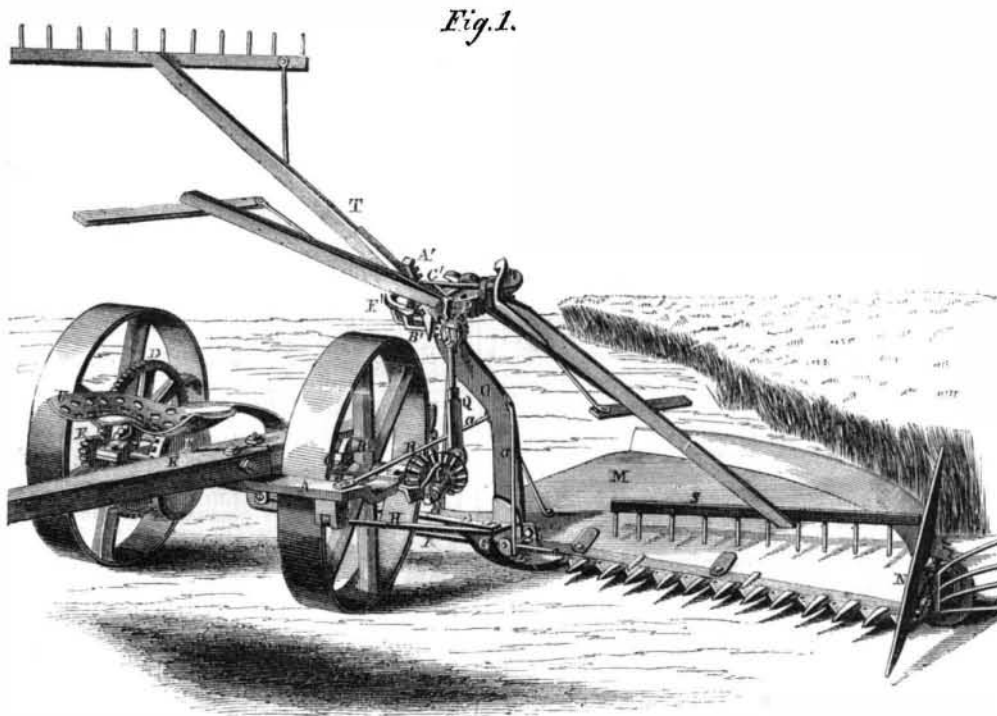
This harvester has a very wide range of usefulness, being adapted not only to cutting grain, but also to cutting grass; it also embraces several novelties in the arrangement of its details, through which a more efficient action of them is obtained. These improvements not only extend to the operation of the machine, but add very much to the ease with which it can be transported from place to place; the improvements also affect the space occupied by the machine when not in use, as by the folding of its parts the bulk can be reduced to a small compass.

center or journal; this gear is revolved by a small pinion, connected by a universal joint to a square bar, Q, said bar being connected by a second universal joint to a bevel pinion below. The whole of this mechanism, rakes and all, is driven by a bevel wheel, R, on the end of the main axle. The bar, Q, is in two parts, one sliding within the other, so as to compensate for any unevenness of position, and the action of the machine is further aided by the universal joints between the upper and lower bevel gears. There is also an arrangement near the pinion, R, by which the rakes and their mechanism may be thrown

kept at work; this is done by a small lever and coupling on the bevel gear shaft. At the lower side of the frame, on the back end, there is a flange cast, which runs under the crank plate and guards against accidental injury to the crank shaft; the attachment of the finger bar to an independentswivel joint, so as to turn slightly on its axis and facilitate folding of the bar against the side of the machine, when about to be transported, is also a good feature. The self-raking arrangement can be attached to any machine, either one or two wheels. It has been thoroughly tested and the inventor claims that it has no superior; unoccupied territory can be negotiated for by addressing the inventor.

This harvester was patented Nov. 3, 1863, through the Scientific American Patent Agency, by Reuben Hoffheins, of Dover, Penn. For further information address the inventor as above.

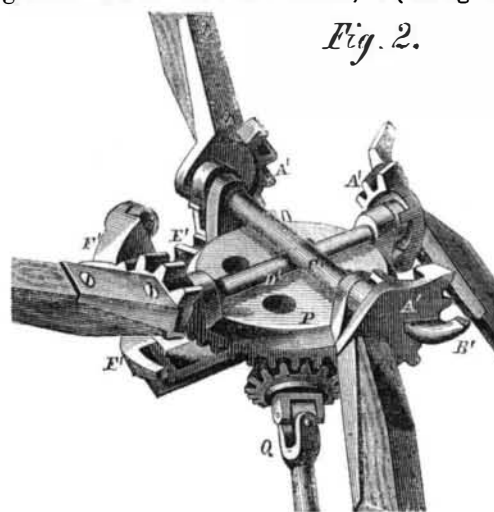
**GAS IN NAPLES.**—Gas pipes are being laid down in Naples. Hitherto, all the streets except three or four had been badly lighted with oil, but now gas will penetrate even into the most deserted quarters.

**HOFFHEIN'S COMBINED HARVESTING AND RAKING APPARATUS.**

The engraving published herewith represents the machine standing in the field. The principal part of the machinery is carried by a bed-plate, A, of peculiar construction. To this plate the axle and tongue are connected. The axle is not fastened to the bed-plate, but runs in boxes; neither are the wheels permanently fixed to the axle, but revolve easily upon it. They are fitted with a pawl, B, which takes into a ratchet wheel, C, on the shaft, so that when the machine is backed for any purpose the cutters do not operate; this pawl can be thrown out when required, so that in any case, going forward or backward, the driving machinery is stationary: the same spring that holds the pawl in the ratchet wheel also keeps it out of gear. The gearing that drives the finger bar is thus arranged:—The spur wheel, D, meshes into the pinion, E; the shaft of this pinion has a large bevel wheel, F, which gears with a bevel pinion, not shown in the engraving; on this latter pinion shaft (which runs down to the extreme back end of the machine) there is a face-plate with a wrist-pin in it, constituting a crank, and from this crank a rod runs directly to the cutter bar. This is the whole arrangement, and by means of gearing up from large to small wheels a high speed of the cutters is obtained. The finger bar has a shoe, G, at the end near the machine, by which it is carried, and this shoe has lugs on it which connect to the draw bars, H and I: through them the cutting apparatus is firmly braced to its work. The draft-pole, or tongue, K, of the machine is also made so that it can be shifted from its present position to a point outside of the wheels, either for cutting grain or grass. A track-clearer is shown at L, as also an adjustable castor roller, which carries the outer end of the cutting machinery. The grain platform, M, is secured to the finger beam by straps and bolts; the sheet iron grain fender, N, is also adjustable, and is fastened to its place by bolts.

A novel feature in this harvester is the arrangement of the raking apparatus, through which the grain is swept off the platform on one side in regular windrows. This mechanism is attached to the top of an upright timber, O, strongly secured to the grain platform; the timber is also rigidly braced to the main machine by the rods, a. On the top of the timber there is an inverted crown gear, P, which works on a

out of gear. The ends of the rake arms are furnished with a section of a bevel gear, A' (see Fig. 2), which has a short tongue, B', projecting from one side; these rake arms are secured to two shafts, C' and D', running over the top of the inverted crown gear; at one side of the crown gear there is a toothed rack, E', in which the gears on the rake arms work; as the crown wheel, P, is revolved by the advancement of the machine, the rake arms are swept over the surface of the grain platform, as shown at S, in Fig. 1; when the gear on the rake arm strikes the rack, E' (see Fig. 2),



the rake is gradually elevated from the grain platform, and is carried round again (as at T, in Fig. 1) to the platform; the tongue, B', on the lower end of the gear, A, slides upon the guard, F', which sustains the rake while passing over the operator's head. The seat for the driver is shown at U.

This harvester has also an arrangement for raising and lowering the cutter bar and its attachments, but it cannot be shown in the engraving, and the cutter bar also folds up at the side, so as to be compact and out of the way in proceeding to and from the scene of labor. All the machinery, whatsoever its functions, can be instantly thrown out of gear by raising the pawl of the ratchet wheel on the main axle, or the cutters may be thrown out and the raking apparatus,

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