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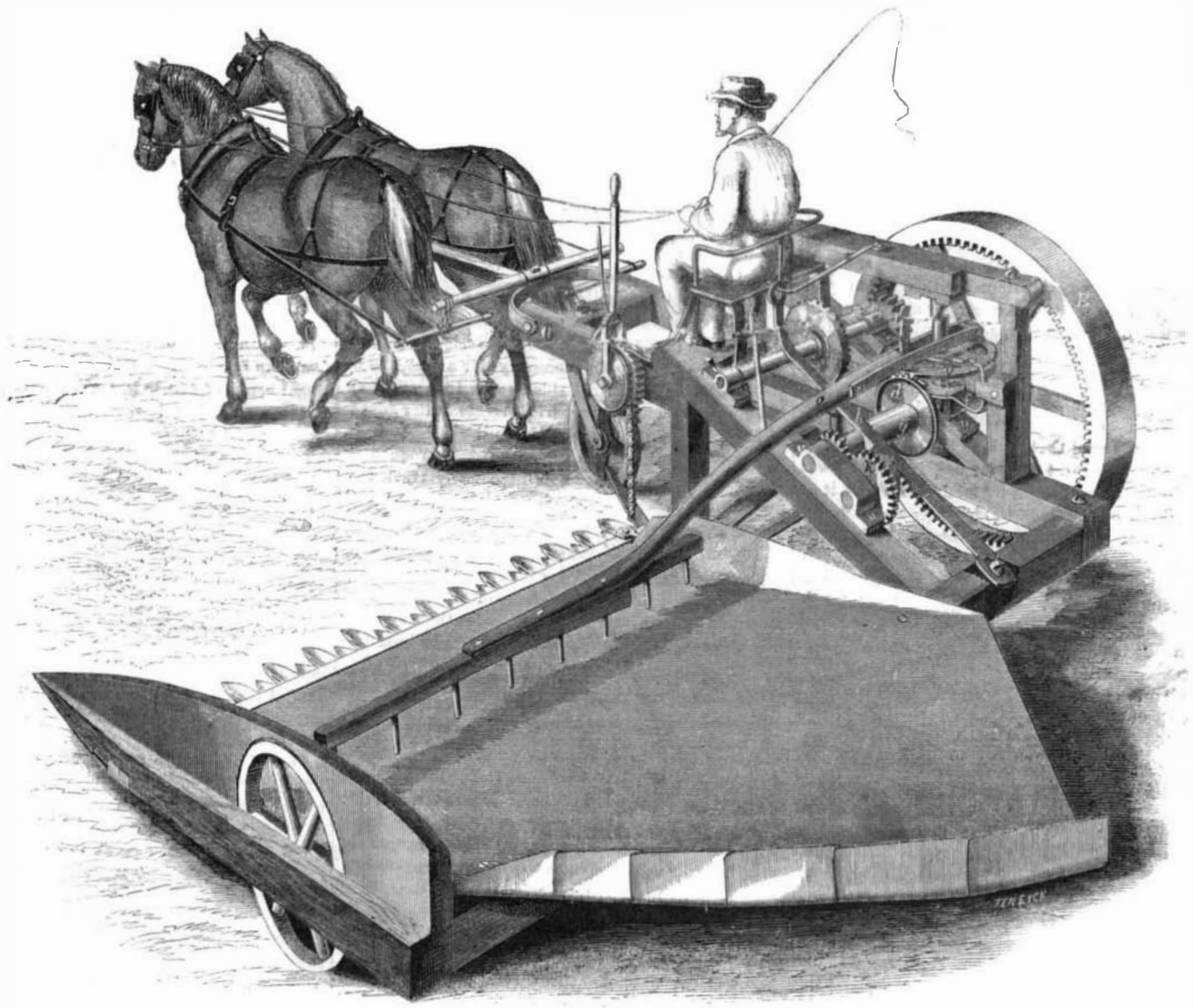
Automatic Rake for Harvesters.

For a long time after the reaping machine was invented, the bundle of grain when it accumulated upon the platform was removed by hand; the application of a self-operating rake having baffled the skill of the ingenious mechanicians who invented the cutting portion of the machine. But when the attention of the great body of inventors was called to the subject, designs for accomplishing the purpose began to come forth by the dozen. We recently illustrated one of the most ingenious of these, and we now present an engraving of another. In this the rake has no more than the requisite movement, sweeping across the platform in a horizontal plane, and then rising and returning over the grain: the motions being all effected by simple devices. The engraving shows all of the parts very plainly.



TWINING'S AUTOMATIC RAKE FOR REAPING MACHINES.

The rake shaft, *a*, is attached at its upper end by a hinge to one side of the wheel, *b*; an upright stud, *c*, being secured rigidly to the opposite side of the wheel, and rising through a slot in the rake shaft, thus allowing the rake to rise and fall, while its horizontal motions are controlled by those of the wheel. The wheel, *b*, has a beveled gear segment upon its edge, meshing into a similar segment on the vertical wheel, *d*, the wheel, *d*, being firmly keyed upon the shaft of the driving or ground wheel, *e*. Exactly opposite to the segment mentioned, upon the wheel, *c*, is a similar segment meshing into a corresponding segment on a second wheel (not shown in the engraving), which is also keyed upon the shaft of the driving wheel. It will be seen that as the shaft of the driving wheel revolves, the rake is swept backward over the platform by one segment of the wheel, *c*, and carried forward to its place by the other.

As the rake begins to move forward from its position at the rear end of the machine, it is raised to pass over the grain upon the platform. To effect this motion a cam is secured to the shaft of the driving wheel near the upright shaft of the wheel, *b*, and acts upon the rake shaft through the medium of a U-shaped plate of metal, *f*. This plate embraces loosely the wheel, *b*, the shaft of which passes freely through holes in the end of the plate; thus allowing the plate sufficient vertical motion to raise the rake over the grain during its movement from the back to the forward end of the platform.

The several parts described are made of proper proportions to remove the grain as often as it accumulates in bundles of suitable size for binding when reaping large or medium crops, but in reaping very light crops the grain requires to be removed less frequently from the platform, and a simple device is readily adjusted to give the rake only one half the number of motions in a given time. To effect this the wheel, *d*, is secured to a hollow shaft which fits loosely upon the shaft of the driving wheel so that it may slide along this shaft; the rotation being imparted by a groove and feather. The engraving represents the wheel as held in place by the lever, *h*, which presses against the end of the hollow shaft, *g*; but when the operator encounters very light grain, he presses the hook, *i*, out from its hold upon the end of the lever, *h*, when a spiral spring, coiled around the shaft of the driving wheel, forces the

wheel, *d*, along the shaft toward the left where it cannot engage with the geared segment upon the wheel, *b*. In this position of the parts the rake will remain without motion in relation to the machine until the wheel, *d*, is carried back where it may again operate upon the wheel, *b*. This return of the wheel, *d*, to its place is effected by a cam, j, upon the side of the wheel, *k*. The wheel, *k*, meshes with a pinion of half the number of teeth, which is fixed upon the shaft of the driving wheel, thus carrying the wheel, *d*, to its place and effecting the motion of the rake at each alternate revolution of the driving wheel.

The other parts of the machine being of ordinary construction, require no description in this place. A reel is employed as usual, but it is omitted from the drawings for the purpose of showing all the parts of the raking device more clearly.

The patent for this invention was granted, through the Scientific American Patent Agency, August 14, 1860, and further information in relation to it may be obtained by addressing the inventor, Isaac C. Twining, at Wrightstown, Penn.

ARMSTRONG GUNS AND IRON-CLAD SHIPS AGAIN —IRONSIDES INVULNERABLE.

We have already devoted considerable attention to the varied phases which the celebrated Armstrong gun has assumed since its first introduction into public life, some three years ago. We now learn from more recent intelligence that it has made another appearance in the British Parliament, this time, however, in a very questionable character, if we may believe the statements which some right honorable member made concerning it.

When this gun came forth from the fertile brain of plain William Armstrong, it was assumed that with it the army and navy of Old England were safe against the combined assaults of all the world—and even lately Uncle Sam was threatened with condign punishment with the terrible Armstrong and the invulnerable ironsides of the British navy The conceited views of the supporters of this terrible gun were toned down a little by information received from China, some two years ago, where it had been tried in actual service.

It was there found that its breech piece was defective; it leaked, became unfit for use, in short it was reported a failure. In various trials made with it at Woolwich and other places, its character also suffered, and it was supposed to be laid aside as a relic of the past. These contradictory statements and opinions were derived entirely from British publications.—They afforded evidence of the difficulty of arriving at the real truth respecting the experiments made with the gun. It is but a few weeks since we were informed, through British sources, that the new, 10-inch, smooth-bore, muzzle loading, Armstrong coiled gun, had, with a charge of fifty pounds of powder and a shot of 156 pounds, pierced through a target representing a section of the frigate *Warrior*, as easily almost as if it had been a pine board. As this target had previously resisted salvos from several 68-pounders and large Armstrong rifle guns, it was given out that the strongest iron-clad ships were of no avail against the new guns. The character of the muzzle-loading, smooth-bored Armstrong at once arose to a high pitch in public esteem, while that of iron-clad ships went down in the same ratio. It was then very generally asserted that iron-clad ships could not be built capable of resisting the new artillery that could be brought to bear against them. But as a counterpoise to such statements and opinions, we find the wonderful penetrating achievements accredited to this Armstrong gun contradicted, by news received quite recently.

Mr. Osborne asserted in Parliament, that the statements which had gone forth to the public respecting the new gun having pierced and destroyed the *Warrior* target with its shot, were untrue. When this target was examined it was found that the 156-pound shot discharged at it with 50 pounds of powder, had not pierced the inner skin plate, but had stuck fast in the teak backing. He stated that after three million pounds sterling had been expended in the manufacture and purchase of Armstrong guns, they were inferior to the old 68-pounders, and were a failure. In reply to such statements, Sir J. Hay admitted that the target of the *Warrior*, said to have been pierced through and through with this gun, remained without being completely penetrated, still, this new, smooth-bore, 10-inch Armstrong exhibited the greatest penetrating power of any gun yet tried. It had been once fired with 90 pounds of powder, and since then, several times with 50 pounds, and it did not appear to be a failure. Sir J. Hay asserted that the experiments with the target only afforded proof that the *Warrior* was sufficiently strong to resist the effects of very heavy projectiles, and that at 200 yards distance she could not be penetrated by any of the guns fired at the target. The London *Mechanics' Magazine*, of May 23d, confirms this statement. It says: "It must be admitted that up to this time, the *Warrior* section has stood the brunt of the heaviest ordnance used in these target trials, with the least damaging effect."

As we are now building several iron-clad vessels for the American navy, and as it involves a very heavy expense to make experiments in firing at iron plates, those which have been made by the British government are of great value to us, as affording information of a practical character. Some new experiments were tried at Shoeburyness, England, on the 20th ulto., with a target made of iron plates, five inches thick, lined with a skin or inner plate one inch in thickness, and a web of india rubber ⅜th-inch thick, placed between the two. The target was supported with longitudinal iron ribs 2½ inches thick. Shells were discharged from 68-pounders with charges of 16 pounds of powder, but they were broken in pieces. Solid 140-pounder and 68-pounder shot were then fired with 16 and 20 pounds of powder, and these broke several rivets and split the iron ribs. The famous 150-pounder smooth-bore Armstrong gun, with a charge of 50 pounds powder, was then fired, when it penetrated through the five-inch plates, making a hole as big as a man's head, and carrying away the inner plate to a distance of thirty yards behind the target. The old target of the *Warrior* being still standing, another similar shot was fired at it, but while it penetrated the outer plate it did not go through the inner one. In order to resist heavy projectiles it seems to be necessary for a vessel to be built with thick and rigid sides, so as to prevent vibration. No material, yet tried, seems better adapted for this purpose, than tough wood. A backing of india rubber, behind iron plates, has been frequently suggested to us; it has now been fairly tried, and found worthless.

Death of Charles Ellet, Jr.

This distinguished engineer died at Cairo on Saturday, the 21st ult., from the effects of the wounds received by him before Memphis. In that engagement, Colonel Ellet unnecessarily exposed himself in his eagerness to manage his rams and witness their operations, and was twice wounded. Colonel Ellet was a native of Pennsylvania, and was by profession a civil engineer. His name is identified with many of the great works of engineering skill in the mountains of Virginia, Maryland and Pennsylvania. He was also the constructor of the first Suspension Bridge at Niagara Falls. Colonel Ellet had an exceedingly vigorous and active mind, and was the author of many new ideas in reference to public improvements, some of which, though ridiculed at the time, have come to attract notice and respect.

At the outbreak of the war Colonel Ellet became deeply interested in military matters. He projected a plan for overwhelming the rebels at Manassas, which found no favor at the War Department, or with Generals Scott and McClellan. Having failed to carry this plan, he criticized General McClellan in a couple of bitter pamphlets.

Colonel Ellet had been for a long time an ardent advocate of iron-clad vessels and rams. But though stimulated by the *Merrimac* and *Monitor* affair, the Departments of the Navy and of War were not inclined to concede all that the sanguine engineer claimed for his plans. He therefore constructed his iron-bound rams with private capital, with the understanding that if they were a success the Government should purchase them. With these the fight before Memphis was fought, and very successfully. The rams and Colonel Ellet at once came into high favor. Colonel Ellet has died on the very threshold of his military career, and when his well-deserved fame was dearest to him. The command of his flock of rams devolves upon a person of the same name, his son or brother, and the iron-headed vessels will again be heard from if any opponent worthy of their "butts" appear.

An American Iron Brig.

The following is part of a communication from R. B. Forbes, Esq., of Boston, respecting the qualities of an American iron vessel. He says:—

In one of your late numbers you allude to the brig *Nankin*, built of iron in 1858, by Mr. Otis Tufts. My correspondents in Hong Kong, China, wrote under date 31st March last:—

On her passage from Ningpo to this place, coming through the Chusam Group, she ran on an undiscovered rock, going at the rate of about nine knots; she came off in half an hour and proceeded on her voyage, not leaking at all—she has gone to Whampoa to be docked and repaired."

On the 13th April they write further:—

We have now to advise that the bottom of the *Nankin* was found quite uninjured, showing not even a scratch from her collision with the rock of reef.

The *Nankin* is probably the strongest vessel of her class afloat, and reflects great credit on her builder, Mr. Tufts. She was once on the beach at Kanawaga, Japan, during a gale for twenty-four hours, and came off whole, when many wooden vessels broke into splinters.

Sugarcane Trash as a Material for Paper.

Gov. Darling, of Barbadoes, has received a letter from Mr. William M'Farlane, a Glasgow stationer, calling attention to the value of the trash of the sugarcane as a material for paper. The writer states that the fuel value of cane trash of every 100 tuns of sugar, is £1,000; and then makes the following calculations:—For every 2,200 tuns (the produce against 100 tuns of sugar) of sugar-cane trash we might safely reckon on getting 2,000 tuns of finished pulp. Let us see the cost of that in London. Fuel, £1,000; wages of a skilled workman, one year, £200; capital invested, £300 at 10 per cent, £30; loss by wear and tear, £30; freights from Jamaica to London at £3 10s, £7,000; add profit on the whole transaction, £5,700; the price of 2,000 tuns of pulp, £14,000 in London, being equal to £7 per tun, or less than one-half of the price of rags, while an additional bonus of £7 per tun of sugar may be conferred in the West Indies, if they only choose to adopt this economy and help themselves. Mr. M'Farlane also describes the machinery—a very simple affair—by which the cane trash can be reduced to pulp for the home market.

How to Make a Boiled Dish.

Almost every family has a dinner as often as once a week of what is popularly known as a "boiled dish," and which, properly cooked, is one of the best dishes in the world; but all cooks do not know the best way to boil corned beef. The common method, in order to make it tender, is to put it into cold water and let beef and water come gradually to boil. This certainly makes beef tender, but also extracts the strength and juice. A better way is to wait till the water boils before putting in the beef; it will then be sufficiently tender and will retain all its strengthening and juicy properties. Hams, after boiling four or five hours, according to size, should be taken out, the skins taken off, and cracker and bread crumbs grated over them, and then baked in a brisk oven for one hour. A leg of mutton can be treated successfully in the same way, only it does not need to be boiled so long, and of course the boiling process should be gentle.

Sandwich Island Cotton.

The Honolulu *Advertiser* says:—Messrs. Crewer & Co. have set one of their cotton gins at work, and a few bags of our Island cotton were passed through it. Both the Sea Island and common varieties were tried, and the gin turned out an article as clean, soft and downy as the most ardent enthusiast of cotton culture could desire. Such cotton as the sample now before us would bring, probably, under the present inflated prices, not less than 25 cents a pound in London or New York, and would bring, in ordinary times, 12½ cents. Let us have more cotton planted and give the article a fair trial. We now have the machinery to clean and pack it in as good order as that produced in any other country. Let us have a sample of one thousand bales or so raised by the close of this year. There need be no fear of any want of buyers when such clean and white cotton can be produced.