Science and Art.

American and European Railroads.

At a late meeting of the Franklin Institute, as published in the *Journal*, Messrs. Z. Colburn and Holly made some interesting remarks in reference to the management of railroads in this country as compared with France and England. From the statements made, it appears that the average cost of maintenance, renewal of way, and engines and working, is, in New York, 70½ cents per mile run, against but 36½ cents in England, and 42½ cents in France. In the northern United States, the average distance run with the consumption of one tun of coal (or wood in equal proportion) is forty miles; in Great Britain it is seventy-seven miles, and in France eighty miles. The greatest economy, therefore, is practised on French roads. The average cost of fuel per mile run in the different countries is about 6 cents in England, 11 cents in France, and 18 cents in New York and Massachusetts. The average receipts per mile are: In New York, $1 76; Great Britain, $1 44; and France, $2 03.

The speed of the British passenger trains exceeds that of the American, the average being twenty-eight miles an hour. The weight of these trains is much less than that of the American, being about 95 tuns in England, and 130 tuns in New York. The difference in speed is likewise accounted for by the lighter grades of the foreign lines. Besides this, the tracks are more carefully laid than is usual here; the cuttings are wider, the drainage very thorough, the ballasting twenty-six feet wide and two feet deep, the cross-ties nine feet long, and saturated either with coal tar, creosote, or sulphate of copper. The rails weigh seventy-two pounds to the yard, being in height five inches, and much more carefully manufactured than in this country

The cost of a mile of first-class English permanent way, at English prices, is but little more than that of a mile of ordinary American railway, at American prices. The passenger locomotives of Great Britain consume raw bituminous coal with entire success, and without smoke. In Belgium also this fuel is used.

Mr. Colburn was of opinion, after a thorough examination of all the facts, that under the foreign system there was an absolute economy of 30 or 40 per cent over the corresponding results on American railways.

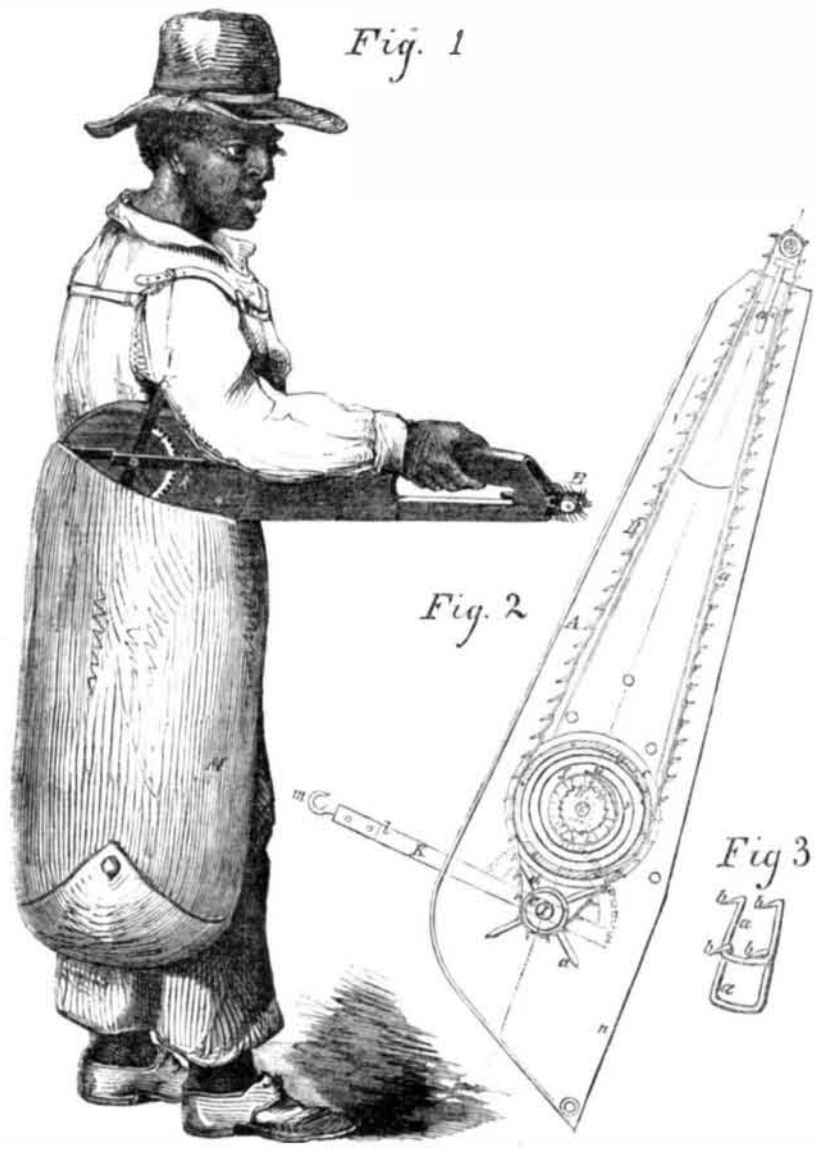
Improved Cotton Picker.

There have been some cotton pickers devised before the one which is the subject of our illustration, but none of them were self-acting, all requiring to be turned by a crank, or some other equally cumbersome method. The chief requisites in an apparatus for this purpose are, lightness, accuracy of working, and portability, or in other words, it must be compact in the arrangement of its parts, and very simple in its operation. These conditions are fulfilled in the cotton picker we are about to describe, which is shown in operation by Fig. 1, and in section by Fig. 2; Fig. 3 being a view of the pickers.

A is a case of tin plate, or other convenient material, from one end of which a bag, M, is suspended, to contain the cotton as picked, and the case and bag are attached to the operator in the following manner:—At each side of the case, A, there is a strip of metal, *k*, and through these pass axles; from one of these, and also carrying a sectional cog wheel, L, on each side, there is on each side a piece, K, which meet at *l*, and a hook, *m*, passing through it, hooks into a strap passing around the operator's body and over his shoulder. Inside the case there is an endless chain of pickers, B, the construction of which is explained by Fig. 3, *a a* being the bent portion, and *b b* the picking points. This chain passes over a small pulley, E, outside the case, that can, by means of its shaft, *a*, be placed further out, or the reverse, to keep the proper tension on the chain, which passes also over a drum, D, and around a wheel, C. The drum, D, has two rims, *c*, and it is hollow; at a point, *e*, in its inside, is secured one end of a spring, F, the other being attached at *f* to a hollow wheel, G. Inside this wheel there is a ratchet wheel, H, and pawl, *k*, all moving on one arbor, E. The wheel, C, moves on an arbor, I, and it is provided with clearing arms, *d*, which serve to detach the cotton from the pickers, and throw it into the bag, M, suspended from the part, *n*, of A.

The operation of the apparatus is very simple. Suppose that the operator has picked the cotton from one pod, in the act of raising

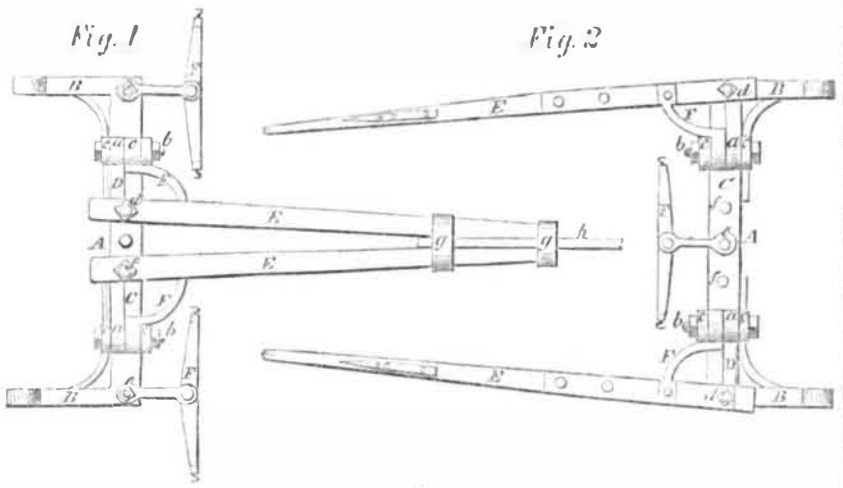
HOSFORD & AVERY'S COTTON PICKER.



the apparatus to the next, while holding it as shown in Fig. 1; by means of the bar, K, sectional wheel, L, and suitable gearing, the spring, F, is wound up, and the moment the pickers are in contact with the cotton, the spring operating the drum, D, rotates it, and causes the endless chain of pickers to clear the pod. The ratchet wheel prevents the pickers moving the wrong way. Then when the apparatus is depressed to another pod, the same operation takes place. The spring being wound up by each movement of the apparatus, and the endless chain of pickers working the moment it is at rest, so that it is perfectly self-acting, and it can be worked by anybody.

It is a remarkably ingenious invention, and will, no doubt, be fully appreciated in the South. M. Hosford and J. C. Avery, of Macon, Miss., are the inventors; and a patent has been obtained this week, the claim of which will be found by referring to another page. Any further particulars can be obtained by addressing the inventors as above.

MITCHELL'S CARRIAGE SHAFTS AND POLE.



This invention is designed to render a carriage applicable for one or two horses with little trouble, so that a pair of shafts or a pole can be used on the one vehicle, at the discretion or convenience of the owner. How this is done will be seen by referring to our engravings.

Fig. 1 represents a bar on a carriage arranged with a pole for two horses, and Fig. 2 shows the same with shafts for one.

A is a bar, which is connected to the front axle of the vehicle either by curved metallic bars, B B, termed "goose necks," or "wooden hounds." The bar, A, may be constructed of wood, and have an iron plate, C, attached to its under side. To the plate, C, two metallic bars, D D, are attached by joints, *a a*, which are about midway between the center of C and its ends. These bars, D D, are in line, or in the same plane with the bar, A, and when turned over, or outwards from the center, have their ends flush with the ends of A. To the outer end of each bar, D, a shaft, E, is attached, the shafts being also braced by bars, F, which are also jointed to C at *a a*. The joints, *a a*, are formed by screw bolts, *b*, passing through eyes in D and F, and through projections, *c*, on C, forming, in fact, a hinge joint. Through the outer ends of the bars, D, and through the inner ends of the shafts, E, holes are made to receive bolts, *d*. These bolts, when the vehicle is used for one horse, pass through holes near the ends of bar, A, and secure the shafts firmly to the ends of said bar, and to the center of bar, A, a whiffletree, F, is attached by a bolt, *e*, (see Fig. 2).

When the vehicle is to be used with two horses, the bolts, *d*, are withdrawn, and the shafts, E, folded or turned over inwards, and the bolts, *d*, passed through holes, *f*, near the center of bar, A, the whiffletree, F, being removed from the center of the bar, and secured to one end of it, the bolt, *e*, of the whiffletree passing through one of the holes that *d* formerly passed through. Another whiffletree, F, is placed in a similar manner at the other end of A. The ends of the shafts, E E, are then connected together by metal bands, *g g*, and they may have a bar, *h*, between them, which will serve to lengthen the pole as desired, as seen in Fig. 1, where the shafts, E E, form a draft pole or tongue. It is not absolutely necessary that the shafts should be hinged to A; they may be made to slide, or joined in any other convenient way. This combination is the invention of V. N. Mitchell, of Concord, N. C., and it was patented January 12, 1858.

Any further information can be obtained by addressing the assignees, Messrs. Area, Mitchell & White, of the above place.

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