

## LETTERS FROM THE PARIS EXHIBITION.

THE REAPER AND MOWER EXHIBITS.

To the Editor of the Scientific American:

It is probable that the present Exhibition will give rise to no more determined and well sustained contest than that between the harvesters of the various exhibitors. It is understood that the English discouraged any field trials, but the Americans urged that no other test could be valuable or conclusive, and it has now, I understand, been determined upon, and some tracts of grain and grass engaged in the neighborhoods of Versailles and Vincennes on the opposite sides of Paris, and each easily reached by rail.

Nothing in the American section is so amply shown as reapers and mowers, and there are few things upon which we pride ourselves more, and none which have done us more credit. The sewing machine and the breech loading rifle are to be classed in this respect with the harvester, but not before it. In the sewing machine, we have but two exhibits in this Exhibition, the "Wheeler and Wilson" and the "American," though the "Singer" and the "Howe," built in British factories, exhibit in the English section. Sewing machines are not in force as at the Centennial, and no such imposing range of machines of this class as was exhibited in the Machinery Hall in 1876 is to be found here. About half of the machines for which space was secured in New York have not been presented here. The assortment from foreign countries also is more limited than at the Centennial. The business has evidently suffered considerably in the two years last past.

Great struggles are being made by Americans and English to secure the French market for harvesters, and also to impress the representatives of foreign nations in Paris. The Americans are decidedly ahead at present, and if they could keep all they have invented they would be still more so, but patents run out and machines are easily copied, and many American improvements are not patented in England, and so are liable to be pirated at once, and some are taken bodily without regard to right. This is not the case with all English manufacturers; far from it, for there are as fine and honorable gentlemen in that fraternity as can be found anywhere, among whom I would cite the late Mr. Hornsby, of Grant-ham, England.

Without entering just now into a close comparison between the American and English reapers, some idea of the closeness of the French copies of the American may be gained from the results of a careful examination of the whole French collection, made several times and repeated to-day.

Many French exhibitors show American and English machines, and the names "Système Wood," "Système Johnston," "Système Buckeye," are common in the French Agricultural Annex. Taking, however, those manufactured in the country, we find ten French exhibitors:

1. Liot, of Rouen.
2. Albaret, of Liancourt (Oise).
3. Limare, of Fecamp.
4. Cumming, of Orleans.
5. Hurtu, of Nancis.
6. Pinet, of Abilly.
7. Hidien, of Chartearoux.
8. Renard, of Nantes. (Mower only.)
9. Palente, of Blangy-les-Arras.
10. Laelier, of Soissons.

What I am about to state by way of comparison would to a very large extent apply to English machines also; but we will take the countries one at a time, and when we have done with them we shall have done with the subject. There is no other competition worth mentioning. No reapers are shown from Spain, Portugal, Russia, Austro-Hungary, Switzerland, Belgium, or Holland. The Canadian and Swedish are more bold-faced piracies than either of the others, and will require a word at the close.

Coming back, then, to the French, we may say first what concerns them generally, and it will be seen that as to this division of the subject they are all strictly on American models—in other words, copies of ours.

All the machines, reapers, and mowers have the cutter bar projecting into the grain, the knife with triangular sections reciprocated horizontally in slotted guards, by pitman and gear connection with the ground wheel of the carriage. One might say, "Of course they are, all reapers are;" but these are not all the possible ways of doing the work, and we have good machines in America which come outside of this description. Witness the front cut mower, for instance, which cuts right behind the team. The points cited are all American, and what I say is, that no French substitute seems to have been found.

Then, again, every one of them has a frame hinged directly to the axle of the carriage, or intermediately, to allow of the vertical adjustment of the height of cut. This is American.

Every one has a divider in the grain and a gathering board at the carriage side end of the finger bar. I do not wish to be monotonous, but these are American. So is the grain platform itself, for that matter.

Is that all? Well, not quite.

Every reaper in the French section has a set of revolving sweep rakes, controlled by the Johnston double cam and switch. Each one of them has its adjustments by means of levers, and this also is American.

A number of the machines have the complete four adjustments, namely:

For raising the cutter to regulate the height of cut.

For giving more or less pitch to the guards relatively to the ground.

For operating the switch of the rake cam.

For throwing in and out of gear with the drive wheels.

All the machines have the last mentioned, and I do not insist upon it, as there are many different ways of doing it, and some are probably novel.

Nos. 1, 3, 6, and 7 of the list of firms have all the four adjustments.

Of the other features of the machines it may be mentioned that they are all right hand cut, turning "gee," as we should say, though I own it is impossible to give an idea of the sounds which a French driver utters.

Of the reapers, Nos. 1, 3, 9, 10, are two-wheeled machines. The others (except 8, which is a mower) are single-wheeled.

Nos. 1, 2, 3, 6, 9, 10, are hind cut; Nos. 4, 5, 7, middle cut; that is, even with the main axle.

The seats are nearly all well over to the near (left) side of the machine, and in some cases the driver's perch is on a hinged frame extending away out beyond the drive wheel, and serving as a partial counterbalance. The hinged seats are in Nos. 4, 5, 7. No. 2, the "Perseverante," has a seat forward on the tongue between the horses.

No. 4 contains a dropper machine (an American invention), which has, what I also noticed among some English droppers, a second seat on the carriage for the raker. In some parts of the United States we do not consider a raker necessary with machines of this class. The slats of their droppers are about three inches wide, and with intervals between them less than their width. This may account for the need of a man to rake off. With us, the slats are narrower, and when the dropper falls the heads of the grain catch in the stubble, and the gavel drags off easily and in good order. I notice, however, one American dropper with a raker's seat and rake. Cumming's machines are much above the average of the French.

As above stated, the American machines exhibited by French agents in their section are not included in the above; so I pass by in this enumeration the *Faucheuse Wood*, and *Moissonneuse Combinée Buckeye*, merely smiling at the strangeness of the united names.

Eight automatic binders are exhibited at the Exhibition. Six of these are American, and two English. Six bind with wire and two with string. The names of the manufacturers are:

*American.*

Walter A. Wood.  
McCormick.  
Osborne.  
Aultman.  
Wm. Anson Wood.  
Johnston.

*English.*

Howard.  
Neale.

Of these, the last-mentioned in each list use string, the others wire. McCormick uses two wires. We are distinctly ahead of other nations in the matter of automatic binders, as we were in the matter of reapers. Of the two English binders, of which I do not propose to speak now, one is a modification of Walter A. Wood's, and is not yet in order, many of the parts being yet absent, and the other is a novelty which it will take much pains and time to develop satisfactorily. It sweeps the gavel backward on to a second and higher platform, and then sideways to the binder, saving the extra width on the left side of the machine (with a right cut); though as this is over the stubble and helps to counterbalance the weight of the platform, I do not see that this lateral extension is any drawback.

All the American machines have adopted the same means of carrying the grain from the platform to the binder. The plan is familiar to us in the Marsh harvester in which the cut grain is carried by a laterally traversing slatted apron to a second apron which carries it up an incline and discharges it on to a collecting table, from which it is taken, sheaf and sheaf about, by two men who ride upon the machine, bind the grain, and drop the sheaves overboard.

In the binding machines the grain falls in the same way on to the table, and the wire (in one case string) is passed around by a bent arm, which in some respects curiously represents that of a man. The wire comes from a spool in a concealed position below or behind the table, and is threaded along the arm and into the hand which holds the end of it. The arm is made to encircle the gavel of grain and bring the end of the wire to the "standing part," as the sailors call it, at a point close to the sheaf, but between it and the spool. The end and standing parts of the wire, being thus in juxtaposition and parallel, are twisted together five times around, and the tie is complete. A succeeding motion, generally of the sheaf, brings the wires beyond the twist against a cutter which severs them, the new end of the wire being at the time fast gripped in the hand of the arm, which makes its backward motion to allow the sheaf to escape. In Walter A. Wood's machine the sheaf is pushed off the machine by a sort of left arm which has previously aided in compression, so as to obviate the necessity of depending upon the tension of the wire for the tightness of the bind; in some other cases the bound sheaf is pushed off by the one following.

The description of the action is purposely made very general so as to be inclusive, but there are many points of detail showing great ingenuity and involving decided differences in construction. For instance, McCormick uses two spools, and the Johnston binder uses a string about the size

of wool twine, which the machine ties in a square knot; the two parts of the string are given a round turn, and the ends passed through the loop and pulled tight. The English string binder, I may here say, makes a reef-knot, which is also a perfectly secure one.

The binding machine is one of the great subjects of the day, the principal one stirring in agricultural engineering, if I may use that term to express what I feel of the admirable skill, persistence, courage, and liberality of the gentlemen who have given their lives, talent, and money to the enterprise. That they have made fortunes is a subject of congratulation on all hands; it is well for them, and an encouragement to the present and succeeding generations. It could never have happened without patents, however, and the people have gained one hundred dollars for every one made by the patentees.

Reference was made above to the anxiety of the American implement maker to secure the French trade, and some details were given as to the almost implicit copying of the American machine. A word on each of these subjects before I close.

Besides the difficulty of distance, with its increased freight, insurance, and so forth, and the added trouble of the time occupied in going back and forth (for a principal must in most cases see his agent now and then), there is another difficulty arising from the fact that we do not stand on as favorable terms as England in regard to the rates of customs duties. England and France have a reciprocity treaty, each mutually admitting the surplus of the other at low rates—English machinery for French claret and silk. It works well for them; but what is the effect on us? Take an instance, to state the matter exactly. An Adriance, Platt & Co. New Model Buckeye weighs boxed 350 kilos. (A kilogramme or 1,000 grammes, called kilo. for short, is almost exactly equal to 2½ pounds avoirdupois.) The import duty on this machine is 18 francs per 100 kilos., or 63 francs per machine. English machines are never boxed for the Continental trade, as the distance is so short, and an English mower will weigh unboxed about 400 kilos., on which duty is paid at the rate of only 6 francs per 100 kilos., or 24 francs per machine. There is thus on each machine a discriminating duty of 39 francs against the American manufacturer, besides the extra expenses owing to greater distance, and the value of the boxes with their added cost of freight.

Even under these untoward circumstances the Americans succeed in obtaining the larger part of the trade in harvesters, and are beginning to do a good work in hay-rakes, lawn-mowers, forks, and churns, as well as some other articles. How important the competition has become may be judged from the fact that one of our firms has sold the past year 50 reapers for New Zealand and has 500 engaged for that colony for next year. Another makes a special reaper which is a favorite in South Australia; another person whose acquaintance with American horse rakes began at the Centennial, has since sold 2,000 of one American pattern.

I referred in the earlier part of this letter to some specially objectionable features in the piracies upon our inventions committed by the Canadians and Swedish.

An Ontario implement maker heads his bills "Watson has it," and so I went over to see what he had. I found that he had not alone copied a machine made in the United States, but that he had actually used the irons of the machine for patterns to make castings, and had not even taken the trouble to chip off the numbers and letters, the private marks by which parts are enumerated in order to save trouble of description. The number "700" is cast on the frame, the same as the Adriance, Platt & Co. machine from which it was pirated. The number "50 A" is on the wheel, and is the mark on a wheel of the same firm but of a different sized machine. The machine has carried its ear marks to France, and the castings were recognized in the Exhibition. There is no doubt that "Watson has it," and none as to the character of the man who took it, I suppose.

A curious parallel specimen of Northern honesty is to be found in the Swedish Department. In that section is a sweep rake with the double cam of Johnston, and a frame with the same "700" on it, actually taken from a similar machine of Adriance, Platt & Co., of New York. It seems to be a favorite one from which to pilfer. The Swedish is a dropper with iron slats. The "700" is on the frame, "701" on the lid of the gear box, "702" on the foot plate, and singularly enough their own number, "455," added with paint. It has also the "50 A" on the wheel. They probably thought there was something cabalistic in the figures and feared to remove them. The inscription on the machine is "Westeras Mekaniska Werkstad." So "he has it" also.

It is curious that both of the firms should concur in stealing from the same machine, should let the numbers stay on, and should send them both to Paris to exhibit in company with the original.

E. H. KNIGHT.

Paris, May 24, 1878.

WAGES IN FRANCE.—The United States Consul at Lyons reports that wages have increased in France since the Franco-German war from 20 to 25 per cent., and the cost of living has risen in about the same proportion. The rates now range from 25 cents to \$2.50 a day of ten hours for men, 20 cents to \$1 for women, and 10 to 30 cents for children. Trade is depressed.