

### S. FRANCIS HOME FOR BOYS, SHEFFORD, BEDFORDSHIRE—THE CHURCH.

At the time when hostility to Roman Catholics was very strong, Shefford appears to have been a sheltered retreat where Catholics lived unmolested. During this period a small chapel was built in the garden behind the priest's house, hidden out of sight of persons passing along the street. This is now the chapel of a home for orphan and destitute boys, and being much too small for this purpose, a new church is to be erected, of which we give an interior view, taken from the drawing exhibited at the Royal Academy. In accordance with the character of the institution, the church will be of the plainest description, the whole of the ornament being concentrated upon the altar and its reredos. The arches shown on the right hand of the view open into a small chapel, with space for the choir organ, and on the left there is a narrow aisle leading to the old chapel, which will serve as sacristy for the new church. To harmonise with buildings in the locality, a late style of architecture has been chosen. The architect is Mr. S. J. Nicholl.—*Building News*.

### MOWING MACHINES.

CONSTRUCTED BY MESSRS. MARSHALL, SONS AND COMPANY ENGINEERS, GAINSBOROUGH.

We take from the *Engineering* journal illustrations and description of Threshing and Mowing Machines at the Exhibition of Agricultural Machines recently held at Taunton, England.

To facilitate the descriptions of the machines in these classes we have selected two different types, American and English, for illustration, and by inspection of them our notice of the other implements will be more clearly understood.

The American mower we have chosen is the two-horse implement manufactured by the William Anson Wood Company, whose London offices are at 5, Upper Thames-street.

The engravings on page 264, show a general view of the machine, while the whole of the different parts are represented in the details marked 1 to 33. The only parts made of wood are the pole A, the hand-lever B, and the track board C. The width of the machine between wheels is 37 in., and to overcome the side strain produced by the action of the finger-bar and knife when in action, and which would otherwise be thrown against one of the horses, the pole, together with the driver's seat, is set somewhat out of centre. The pole is bolted to the draught plate 12, the axle of the wheels passing through the holes *a a*. On the same axle a floating frame 33, is carried by the brackets *b b*, the width between which is exactly equal to the width of the draught frame *a a*, so that the latter fit between the brackets of the former. The driving wheels 7 are placed on each end of the axle, as shown in the general sketch, and on each of them is cast a wheel with internal teeth, into which gears the pinion *c*, of detail 11. There are two of these pinions, each gearing into the internal toothed spur wheels, and mounted on the cross-shaft running in the bearings *d d*, of the floating frame 33. Upon the cross shaft is placed the bevel spur wheel 23, which drives the pinion 24. On the end of the spindle 19, which passes through the arm *e*, of the floating frame 33, this arm containing two bearings 6 in. long, one at each end, in the positions shown by the lubricators *f f*. At the end of the spindle 19 opposite the bevel pinion 24, is the disc *g*, on the face of which is cast a projection which serves as a counter-balance. Opposite to this is the crank pin *h*, set a little more than  $\frac{1}{4}$  in. from the centre, so that the throw is rather over 3 in., which is the pitch of the fingers. On the crank pin is placed the "pitman" or connecting rod 18, one end of which is formed with an eye brass bushed, and the other with a hook that takes into the end of the knife bar 31. This knife bar, of course, works to and fro upon the finger bar 3 being held in place by three small guides 5a, bolted down to the finger bar, a fourth one being formed of one end of the piece 4, the use of which will be explained shortly. A very noticeable detail in this machine is the manner in which the connecting rod is attached to the knife bar shown at 31 and 31a. To the end of the knife is welded a small block, out of which are cut two projections *i i*. Between these a block *k*, is placed and held by pins, as shown, while in the block is formed a hole in which the hook at the end of the connecting rod is

placed. This arrangement permits the free working of the machine even if the connecting rod is bent by a blow in the field. The knife bar is held in place by an extremely simple contrivance. On the top is placed the casting 4, which is bolted down through the finger bar to the sole plate *l*, formed in the bar 20, while in front, and pressing against the front edge of the knife bar is the piece *m*, (see 20), which is also fastened to the end of the arm 20, and is kept up in its normal position by a spring. When it is desired to take out the knife or to remove the connecting rod, all that is necessary is to depress the piece *m*, till it clears the hook and attachment to the knife bar, and to unhook the former. The arm 20 to which we have just referred is a very important part of the implement. It forms a part of the floating frame 33, one end *n*, resting in the bracket 8, which is bolted underneath the bracket *o*, on the frame 33. On the lower end of the arm 20, and beyond the sole plate *l* in the bracket *p*, which carries the castor wheel 6, to which a free motion is imparted by means of the coupling 9, that attaches it to the bracket *p*. Through the hollow arm 20, passes the rod 21, one end of which is bolted fast to the bracket 8, and the other projects sufficiently to have attached to it the end of the chain 14. The end *g*, of the bar 17, is also passed over the end of the rod 21, the other end being attached to a collar placed around the end *f*, of the arm *e*, of the floating frame 33. We should here mention that the hole in the back of the bracket 8, through which the end of the rod 21 passes, is not round but oval, in order that the arm 20 may be free to rise or fall, and still remain tight.

Having now described the leading parts of this mower, we may recapitulate a little in order that our description may be clearly understood. The implement then runs upon two wheels 31 in. in diameter and placed 37 in. apart, each with an internal geared wheel upon it, which together drive pinions mounted on a spindle parallel to the axle of the carrying wheels. This spindle has upon it a bevel wheel driving a bevel pinion which passes down one arm of the floating frame placed on the axle, and driving, through a crank pin and connecting rod, the knife working in guides on the finger bar. The latter is bolted to a shoe on the end of an arm threaded on a bolt fastened at one end to a bracket on the floating frame, and at the other having a tie-rod connecting this arm and the fixed arm through which the spindle driven by the bevel wheel on the cross shaft passes. By this arrangement the movable arm 20 can be raised or lowered, or it can be turned around the bolt on which it is threaded.

To return to further details. On the end of arm *e*, 33, and protecting the disc *g*, 19 from obstruction, as it passes through the crop, is the shield 22. This is a very essential provision to prevent the grass from winding round the disc and damaging the machine. The form of the dividing shoe is shown at 2. In the forward part of the shoe is an opening in which is the sole plate *r*, to which the finger bar is bolted. To the rear at *s* a projection is cast on the shoe, having a groove in it as shown, to which is attached the small wheel which supports the end of the dividing shoe. This wheel is shown at 1, and it runs on a small sleeve *t*, through which a square headed bolt passes, the head is placed in the groove in the shoe, and the nut is tightened up against the sleeve so as to hold the wheel in place. By this arrangement it is obvious that the position of this wheel may be shifted at will so as to raise or lower the finger bar. This latter is shown at 3, and consists of a taper bar of wrought iron rolled cold,  $\frac{1}{2}$  in. thick,  $4\frac{1}{2}$  in. wide at one end, and 2 $\frac{1}{2}$  in. at the other. To it the fingers 5 of steel are bolted, as well as the three guide brackets 5a, as before spoken of. It is necessary to fulfil the conditions of working that the finger bar and knife should be under the control of driver, so that it can be lifted instantaneously to pass over any obstacle, and dropped again as suddenly to resume its normal work. Again it is often desirable to raise the inner end of the bar, or to lift the latter, so that the dividing shoe is higher than the attachment between the knife and the connecting rod. The arrangement of the machine enables all these conditions to be fulfilled. The lifting of the finger bar is effected by means of the lever B, which has a spring detent operated from the handle, and engaging in the teeth of the curved rack 32 attached to the frame. The lower end of the lever B, is turned round, and at the end is fastened the chain 14 which passes around the quadrant 13 also on the frame. When the driver raises the detent and throws over the lever the chain is lifted, and as it will be remembered that