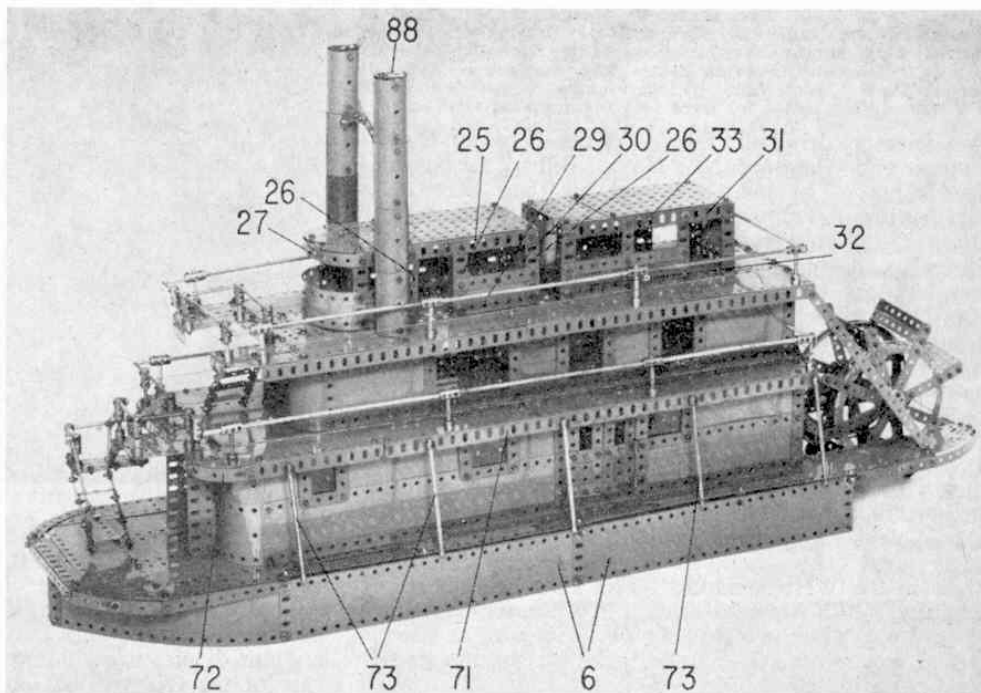


STEAM- BOAT BILL



Spanner describes an advanced model illustrating a famous period of American history

THANKS TO AN ENDLESS STREAM OF BOOKS, films and magazines we are all familiar with the wild days of American history—the war whoops of Indians mixed with the gunfire of Cowboys and Cavalry Patrols, the vast herds of buffalo and longhorn cattle, the slow-moving waggon trains of brave settlers pushing adventurously westward. We are especially familiar with the most publicised forms of travel in those pioneering days—the horse, the covered waggon, the stagecoach and the frontier railroads—but there is still another form of transport which does not receive quite so much publicity as all these, and yet which played a tremendously important role in American transport history.

I speak of the Riverboats—those unique craft, looking for all the world like large floating hotels or barns, which plied the thousands of miles of navigable waters found in rivers such as the Mississippi, Missouri and Ohio. Necessarily shallow in draft because of the frequent shallows present in the rivers they worked, these utterly captivating boats were probably first to really open up the interior of what was then a sparsely-populated country, not only carrying settlers hundreds of miles inland, with all their goods and possessions, but also supplying and generally servicing the communities, towns and cities the settlers founded, over a period lasting many years!

Perhaps significantly, the Riverboats of the type in question could never be compared with river craft of today. Manufactured almost entirely from wood at a time when steam traction was in its infancy, the typical Riverboat was powered by a rather crude, wood-fired steam engine and propelled by a huge stern-mounted paddle wheel. There was always a slight danger of the engine's boiler blowing up and even greater danger of the wooden superstructure of the boat being set alight by the clouds of sparks which frequently billowed from the engine's smokestacks, although the latter danger was minimised by building

the smokestacks as long as possible. Taking all this into account, however, and overlooking the fact that the top-heavy construction of the boat made the possibility of capsizing an added danger, the old Riverboats did sterling work and won a well-deserved place in the affection of Americans everywhere.

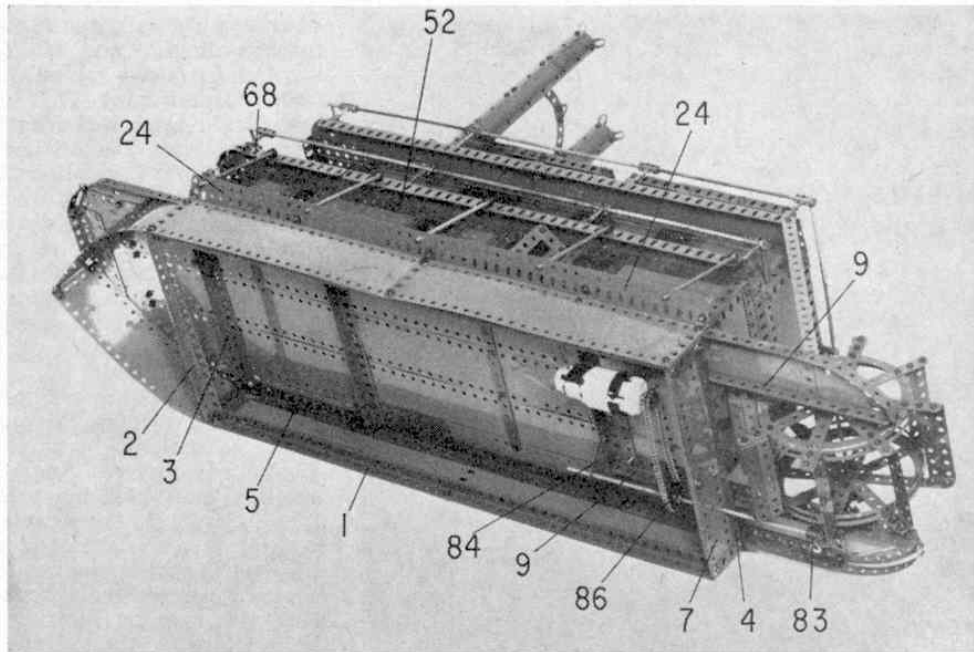
All this now brings us to the Meccano model featured here. Needless to say, this is based on a typical Riverboat of the period and it does, in my opinion, capture all the charm of the subject. It will not float, of course, but it reproduces the general lines of the prototype and the paddlewheel revolves, powered by a Motor with Gearbox carried in the hull. Although large, it is not particularly difficult to build and, when finished, it makes a superb display model.

Hull

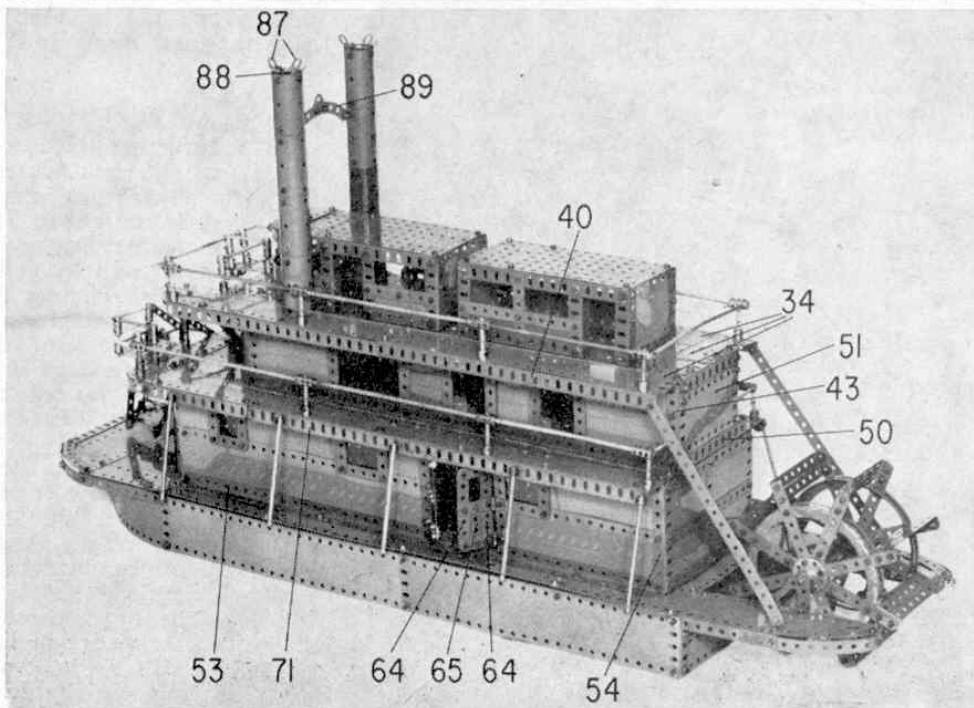
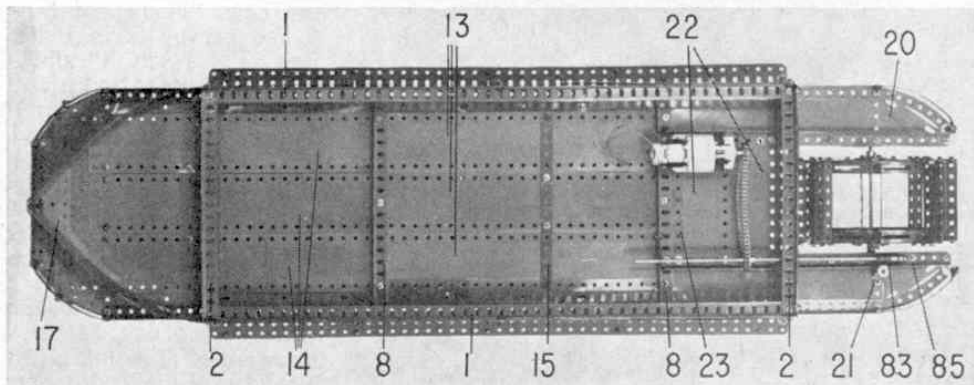
Beginning construction, like any true boat-builder, with the hull, a rectangular framework is built up from two $24\frac{1}{2}$ in. Angle Girders 1 connected at the ends by two $9\frac{1}{2}$ in. Angle Girders 2. Attached to the corners of the framework are four $2\frac{1}{2}$ in. Angle Girders, the two Girders at one end being connected through their upper end holes by a $9\frac{1}{2}$ in. Angle Girder 3 and the two Girders at the other end being connected through their second holes by another $9\frac{1}{2}$ in. Angle Girder 4. The upper ends of the $2\frac{1}{2}$ in. Girders are then connected longitudinally by two 33 in. compound angle girders 5, each built up from a $24\frac{1}{2}$ in. Girder extended by a $9\frac{1}{2}$ in. Girder. Note that each compound girder projects nine holes beyond Girder 3, but extends only eight holes beyond Girder 4.

Each side of the resulting girder framework is now enclosed by two $12 \times 2\frac{1}{2}$ in. Strip Plates 6, these Plates being extended forward by a $9\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate. The latter Plates at each side are curved round and connected together by Angle Brackets to form the bow. At the rear, the framework is enclosed by two $5\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates 7 overlapped three holes.

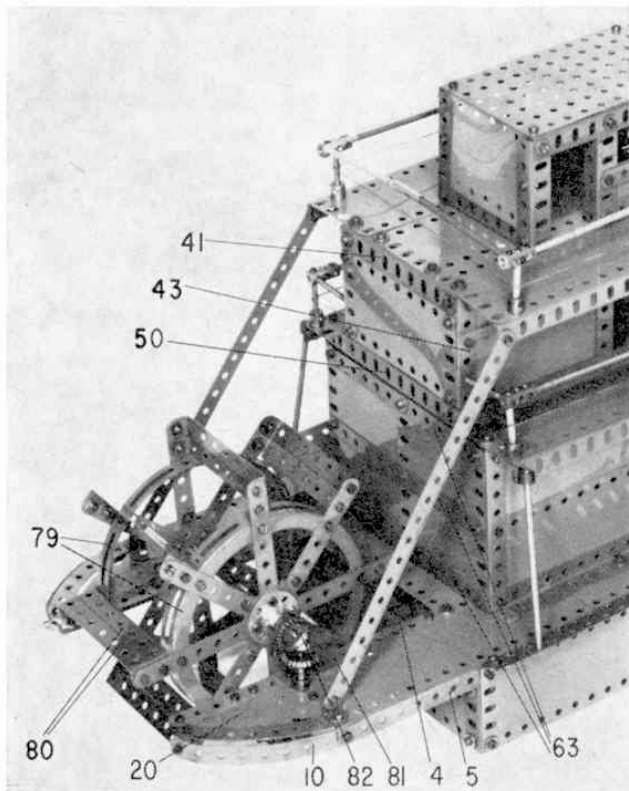
Opposite: Steamboat Bill
—an advanced Meccano
model based on a Missis-
sippi Riverboat from a
romantic period of
American history.



Two underside views of the
Steamboat showing the
Girder framework sup-
porting the hull.

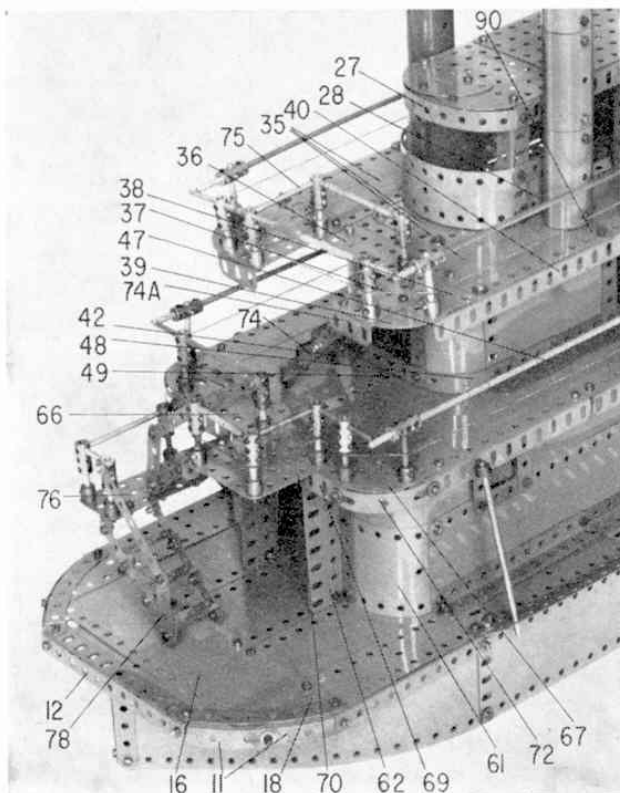


Looking at the size of the
paddle wheel in relation to
the whole model, it is easy
to understand how the real
Steamboats managed to
plough their way up and
down the rivers they
worked for so long.



Above: A close-up view of the paddle wheel, which realistically revolves, driven by a Motor with Gearbox mounted in the hull.

Below: Construction of the companionways and saloon doorways is clear from this close-up view of the forward section of the model.



Compound girders 5 are now connected together through their 24 and 48 holes, counting from the forward end, by two $9\frac{1}{2}$ in. Angle Girders 8, two longitudinally-positioned $12\frac{1}{2}$ in. Angle Girders 9 being bolted to rearmost Girder 8 through their fifth holes from each end. These latter Girders are also secured to Girders 4 by $\frac{3}{4}$ in. Bolts, while their rear ends are connected to the rear ends of respective compound girders 5 by a shaped $4\frac{1}{2}$ in. Strip 10, attached to an Angle Bracket which is, in turn, attached to Girder 9 by a Fishplate. The front end of the each compound girder 5 is extended by two Formed Slotted Strips 11, partially straightened, the ends of the Formed Slotted Strips at each side being joined by a $5\frac{1}{2}$ in. Angle Girder 12.

The deck plating can now be added, using suitable Flexible Plates. On the model illustrated, the greatest area was enclosed by three $12\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plates 13 bolted between Angle Girders 8, another three similar Plates 14 being bolted between forward Girder 8 and Girder 3, these projecting ten holes past Girder 3. Bolted to the undersides of Plates 13 is a $7\frac{1}{2}$ in. Strip 15, which secures the Plates together, while Plates 14 are extended forward by a $7\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate 16, running transversely, a $5\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plate 17 being bolted to Angle Girder 12 to cover the bow. The space between each compound girder 5 and nearby Strip Plates 13 and 14 is enclosed by five $5\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates, suitably overlapped, the final forward corner of the deck being covered by a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Triangular Flexible Plate 18. The space between each Girder 9 and respective compound girder 5 is enclosed by a $9\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate 19 extended by a $3\frac{1}{2} \times 2\frac{1}{2}$ in. Triangular Flexible Plate 20, one securing Bolt helping to fix a Double Bent Strip 21 to the underside of the deck, as shown. Two $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates 22 are bolted between Girders 9, at the same also fixing a $5\frac{1}{2}$ in. Strip 23 between the Girders. Bolted to this Strip and to left-hand Girder 9 is a 3-12 volt Motor with Gearbox, output shaft rearwards. This unit will later drive the paddle wheel. The deck is extended outwards and upwards at each side by two $12\frac{1}{2}$ in. Flat Girders 24 attached to the deck by Obtuse Angle Brackets.

Saloons and Deck Houses

In constructing the model, it is best to build up the saloons and deck houses separately, fitting them to the main deck when completed. Starting with the forward deck house, two $7\frac{1}{2}$ in. Angle Girders 25 are connected together by two $5\frac{1}{2} \times 3\frac{1}{2}$ in. Flat Plates, overlapped seven holes and extended forward by two overlapping Semi-circular Plates joined at their apices by a $2\frac{1}{2}$ in. Curved Strip. Attached to each Angle Girder 25 are four 3 in. Angle Girders 26, positioned as shown, the forward securing Bolts also fixing a shaped $5\frac{1}{2}$ in. Strip 27 between Angle Girders 25. Bolted between the first and second Angle Girders 26 at each side are a $2\frac{1}{2}$ in. Strip and a $2\frac{1}{2}$ in. Angle Girder 28, the securing Bolts also holding a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plate in position. Bolted between the third and fourth Angle Girders 26 are a $3\frac{1}{2}$ in. Strip and a $3\frac{1}{2}$ in. Angle Girder 29, the securing Bolts also holding two overlapping $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates in position. Note that Girders 28 and 29 are bolted to the lower ends of Girders 26. The back of the deck house is supplied by a $3\frac{1}{2} \times 2\frac{1}{2}$ in. Plastic Plate 30 and a $3\frac{1}{2}$ in. Angle Girder, bolted between rear Girders 26 at each side.

In the case of the after deck house, two $7\frac{1}{2}$ in.

Angle Girders 31 are again connected by two overlapping $5\frac{1}{2} \times 3\frac{1}{2}$ in. Flat Plates, but only three 3 in. Angle Girders are bolted to each of them, one at each end and one through the fifth hole from the back. The first and second Girders are connected by a $5\frac{1}{2}$ in. Strip, a $5\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plate and a $5\frac{1}{2}$ in. Angle Girder 32, these three parts also being connected to Angle Girder 31 by a 3 in. Strip 33. Both the front and rear of the deck house are enclosed by a $3\frac{1}{2} \times 2\frac{1}{2}$ in. Plastic Plate and a $3\frac{1}{2}$ in. Angle Girder, bolted between the respective upright 3 in. Angle Girders.

When completed, the deck houses are secured to the upper deck by means of Angle Girders 28, 29 and 32, etc., the deck itself being built up from three $12\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plates 34, extended forward by three $9\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plates 35. Note, however, that the two centre Plates are overlapped three holes, while both pairs of outside Plates are overlapped only one hole. The forward ends of Plates 35 are connected by a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flat Plate 36, the securing Bolts also holding an extension to each corner of the deck in place. Each extension consists of a $3 \times 1\frac{1}{2}$ in. Flat Plate 37, a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plate 38 and a Semi-circular Plate 39. A 23 in. compound angle girder 40 is bolted to each side edge of the deck, as shown, each compound girder being built up from two $12\frac{1}{2}$ in. Angle Girders overlapped four holes.

Coming to the upper saloon, two 20 in. compound angle girders, each built up from an $18\frac{1}{2}$ in. Angle Girder extended by a $2\frac{1}{2}$ in. Angle Girder, are connected together at the rear end by a $4\frac{1}{2}$ in. Angle Girder 41, the other end of each girder being extended forward by a Formed Slotted Strip, the Slotted Strips at each side being connected by a $2\frac{1}{2}$ in. Strip, with the securing Bolts also holding two vertical $3\frac{1}{2}$ in. Strips 42 in place to serve as the forward entrance way. Bolted to each compound girder are two $3\frac{1}{2}$ in. Angle Girders 43, one at each end, six $3\frac{1}{2}$ in. Strips, two $3\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates 44, two $4\frac{1}{2} \times 3\frac{1}{2}$ in. compound flexible plates 45, each built up from two $4\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates, and a $3\frac{1}{2} \times 2\frac{1}{2}$ in. compound curved plate 46, the latter built up from two $2\frac{1}{2} \times 2\frac{1}{2}$ in. Curved Plates. The compound curved plate follows the contours of the Formed Slotted Strip and it is also bolted to Strip 42.

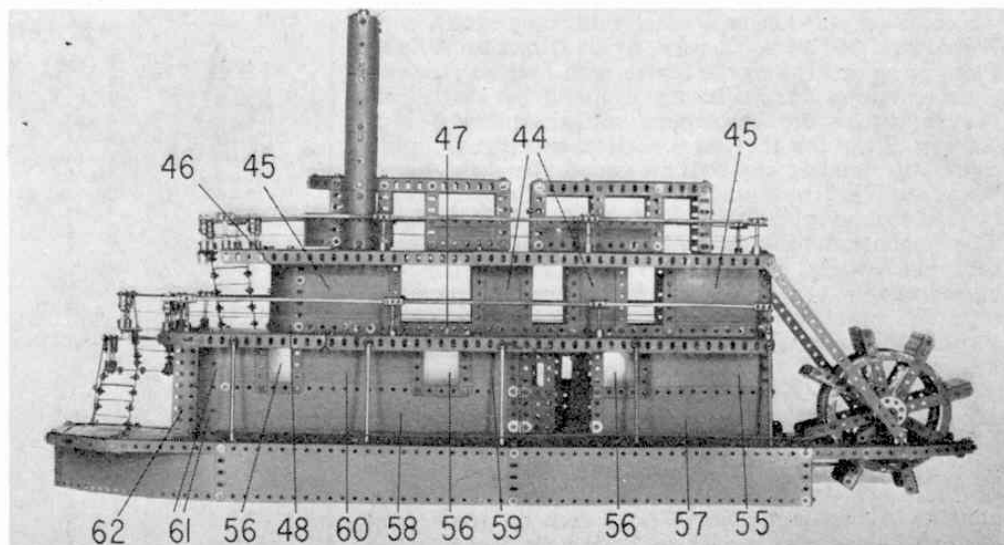
The positions of the other Strips and Plates are evident from the illustrations, and it will be seen that

they are arranged leaving gaps in the side walls to represent windows. The lower ends of the Strips and Plates are connected by another 20 in. compound angle girder 47, as shown, this girder again being extended forward by a Formed Slotted Strip 48. These Formed Strips at each side are bolted to Strips 42, at the same time fixing a $2\frac{1}{2}$ in. Strip 49 in place between them. The rear ends of compound girders 47 are connected by a $5\frac{1}{2}$ in. Angle Girder 50, while the back of the saloon is completed by a $4\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plate 51, bolted to Angle Girders 43.

This brings us to the lower saloon, each side of which consists of two 23 in. compound girders 52 and 53 connected together by two $4\frac{1}{2}$ in. Angle Girders 54, one at each end, and three $4\frac{1}{2}$ in. Strips, at the same time fixing in position a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plate 55, three $2\frac{1}{2} \times 2\frac{1}{2}$ in. Transparent Plastic Plates 56, a $7\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate 57, a $12\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate 58, a $2\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plate 59, a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plate 60 and two $5\frac{1}{2} \times 2\frac{1}{2}$ in. Plastic Plates 61. The Transparent Plastic Plates, of course, serve as windows, the two forward Plates being edged by Perforated Strips to serve as window frames. Plastic Plates 61 are curved round, as shown, and bolted to a $4\frac{1}{2}$ in. Angle Girder, which will later be bolted to the centre deck. Secured to the spare flange of this Angle Girder is a $4\frac{1}{2}$ in. Flat Girder 62. Note, incidentally, that forward Angle Girder 54 is hidden from view behind Plates 58 and 61. The rear of the saloon is enclosed by four overlapping $3\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates overlaid by three $6\frac{1}{2}$ in. compound strips 63, all bolted to rear Angle Girders 54.

Two sets of double doors are provided each side of the saloon, each door being built up from two $3\frac{1}{2}$ in. Strips 64 and a 2 in. Strip 65, connected at top and bottom and in the centre by $1\frac{1}{2}$ in. Strips. The doors are attached to the appropriate $4\frac{1}{2}$ in. Strips in the saloon sides by two hinges in each case.

Built onto the top of the lower saloon is the centre deck, this consisting of eight $12 \times 1\frac{1}{2}$ in. Strip Plates extended forward by two $5\frac{1}{2} \times 1\frac{1}{2}$ in. Flexible Plates 66 (overlapped nine holes) and two Semi-circular Plates 67, the securing Bolts also fixing a $7\frac{1}{2}$ in. Strip 68 to the underside of the Plates. Plates 66 are edged at the front by a $6\frac{1}{2}$ in. compound angle girder 69 built up from two $3\frac{1}{2}$ in. Angle Girders and held in place by Rod Sockets instead of Nuts and Bolts, two of the Rod Sockets also fixing a $2\frac{1}{2} \times 2\frac{1}{2}$ in. Flat Plate



A side elevation of the Steamboat showing its realistic shape, "looking for all the world like a floating hotel or barn."

70 in position. The deck is edged at each side by an 18½ in. Angle Girder 71 and a 5½ in. Angle Girder, the latter extended by a Formed Slotted Strip 72 to connect with compound girder 69. The deck, of course, is attached to the top of the saloon by means of compound angle girders 52. Once it is in place, Flat Girders 62 are secured to the underside of Strip 68 by Angle Brackets, then the upper saloon can be added by bolting compound girders 47 to the deck. After this, the upper deck, with the deck houses, can be secured to the top of the upper saloon by bolting it to the upper 20 in. compound angle girders, with bracing 9½ in. Strips being secured between the rear end of each compound girder 40 and an Angle Bracket attached to the lower deck. Imitation stays between the centre and lower decks are supplied by 4½ in. Rods 73, the lower ends of the Rods projecting through the outer row of holes in Flat Girders 24 and the upper ends being held in Collars secured to compound girder 71.

At the front end of the model, sets of stairs, or "companionways", are provided, running from deck to deck. The upper companionway, running between the centre and top decks, is provided by two 4½ in. Narrow Strips, attached to the underside of left-hand Flat Plate 37 by Angle Brackets. Upper deck guard rails around the companionway "well" are provided by suitable Rods held in the end transverse bores of Couplings fixed on the ends of 1 in. Rods carried in Rod Sockets secured to the deck. Note that the front Rod Sockets secure two 1½ in. Angle Girders 74A to the underside of the front edge of the deck and note also that a 2 in. Screwed Rod 75 must be used for one of the guard rails, the appropriate bores in the two nearby support Couplings being threaded. Guard rails round the remainder of the deck are again supplied by suitable Rods held in Couplings on 1½ in. Rods also fixed in Rod Sockets secured to the deck.

The lower companionway between the lower and centre decks is built in two sections with a "landing" in between. The upper section is supplied by two 2½ in. Narrow Strips connected by two 1½ × ½ in. Double Angle Strips, while the lower section is made up of two 3½ in. Narrow Strips connected by three 1½ × ½ in. Double Angle Strips. A 3 × 1½ in. Flat Plate 76 serves as the landing, the upper companionway being attached by Angle Brackets and the lower companionway being attached to the lugs of a 1½ × ½ in. Double Angle Strip bolted to the underside of the Plate. At its top end, the upper section is attached to compound angle girder 69 at one side, the other side being attached to Flat Plate 70 by a Corner Angle Bracket 77, the Plate being secured to the centre deck by Rod Sockets. Companionway handrails are supplied by two 3 in. Narrow Strips for the upper section and a 3½ in. Narrow Strip for the lower section, with guard rails round the landing, as well as round the deck, again being supplied by suitable Rods and Screwed Rods held in Couplings on short Rods fixed in Rod Sockets. The lower end of each outside companionway handrail, incidentally, is supported by a 2 in. Strip 78, as shown.

Paddle Wheel and Funnels

All that now remains to be built is the paddle wheel and the two distinctive smokestacks—items which are deliberately left until last to avoid the possibility of them being damaged during assembly of the main parts of the model. The paddle wheel consists of two Hub Discs 79, to each of which four 3½ in. Strips, inter-spaced by four 3 in. Strips radi-

ating outwards, are bolted, at the same time fixing an 8-hole Bush Wheel to the centre of the Hub Disc. The end of each Strip attached to one Hub Disc is then connected to its opposite number on the other Hub Disc by two 3½ × ½ in. Double Angle Strips 80 these Double Angle Strips, of course, serving as the actual paddles.

The completed assembly is fixed on a 5 in. Rod journalled in two Flanged Brackets 81, one bolted to each protruding rear "wing" of the lower deck. Three Washers space the paddle wheel from the right-hand Flanged Bracket. Fixed on the right-hand end of the paddle wheel axle is a 7/8 in. Bevel Gear 82 which meshes with a similar Bevel Gear on a 2 in. Rod journalled in the deck plates and in Double Bent Strip 21 and held in place by a Collar. Mounted on the lower end of this Rod is a ½ in. Pinion which engages with a Worm 83 on an 11½ in. Rod journalled in right-hand Flexible Plate 7 as well as in a 1½ in. Corner Bracket 84, bolted to rear Girder 8, and in a 1½ in. Strip bolted to a 1 × 1 in. Angle Bracket 85 secured to the underside of right-hand Girder 9. A Collar holds the Rod in place. Secured on the Rod is a 1 in. Sprocket Wheel 86 which is connected by Chain to a ¾ in. Sprocket Wheel on the Motor output shaft.

In the case of the smokestacks, each of these is similarly built up from four Cylinders connected together by two 9½ in. Strips bolted down the insides of the Cylinders. Four Obtuse Angle Brackets 87 are carried at the top of each Chimney, three of the Brackets being bolted directly to the top Cylinder and the fourth being bolted to a 1 × ½ in. Angle Bracket 88, held in place by the Bolt fixing the centre of the first three Obtuse Angle Brackets in position. The fourth Obtuse Angle Bracket could, of course, be bolted directly to the Cylinder, but Angle Bracket 88 partially covers the end of the Chimney to represent a cinder trap. Both chimneys are connected together by two 2½ in. Curved Strips 89, attached to the Chimneys by Angle Brackets, a 1 in. Triangular Plate being bolted to the centre of the Curved Strip for additional effect. The chimneys are each attached to the upper deck by a 1 × ½ in. Angle Bracket 90 to complete a large but extremely impressive model.

PARTS REQUIRED

6-1a	4-12b	12-59	30-179
2-1b	18-12c	30-63	10-188
3-2	1-13	1-70	15-189
8-2a	6-13a	1-72	2-190
38-3	6-14	3-73	4-190a
10-4	1-14a	1-74	6-193a
16-5	10-15a	1-77	3-194b
9-6	2-15b	5-81	4-194c
13-6a	4-16	1-82	1-194d
4-7	1-16a	4-89b	3-195
10-7a	3-17	3-90	6-196
6-8	16-18a	1-94	22-197
8-8a	18-18b	1-96	4-200
4-8b	1-26	1-96a	2-213
11-9	2-30	4-103b	6-214
6-9a	1-32	2-103c	10-215
12-9b	558-37a	2-111	8-216
14-9c	558-37b	2-111c	2-221
10-9d	156-38	8-114	2-226
2-9f	1-45	2-118	2-235
2-10	10-48	1-133	1-235a
19-12	16-48b	1-139a	4-235b
1-12a	4-52a	1-139b	2-235d
		1-154a	

1 Motor with 6-speed Gearbox