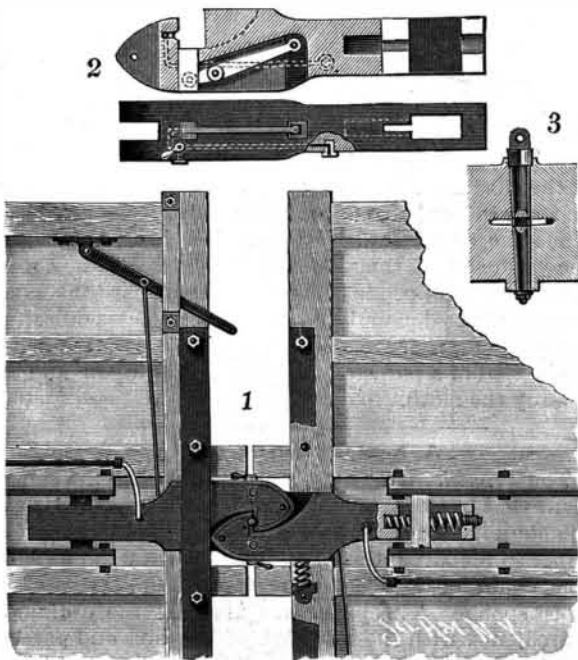


Combination Cement and Iron Bridge.

A new bridge was recently completed over the River Neutra, in Hungary, according to a system devised by Robert Wunsch, and consists of beton arches in which iron skeleton framework has been incorporated. The iron work comprises not simply single iron rods, but complete trusses made up of horizontal upper and parabolic lower chords. Cross girders and tie rods, however, have been entirely omitted and are supplanted by the beton. The wooden false work of the bridge was built to form a series of moulds, each mould constituting one complete bridge arch, and after the iron work had been put in place the beton was dumped in and thoroughly rammed. The work was divided up, so that the beton filling of each arch was completed in one day, and the false work was kept in place for an average of 37 days for each arch. The bridge piers also consist of beton. There are, in all, six arches. The total length of the bridge is 377½ feet and the width 19.7 feet. The whole work of construction was completed in four months, including the time consumed in driving piles for the pier foundations.

AN IMPROVED CAR COUPLING.

This coupling is so secured to the cars as to prevent its pulling out, and its interlocking jaws render the telescoping of the cars impossible. The improvement has been patented by Mr. Robert N. Ervin, of Cleburne, Texas, a locomotive engineer of twelve years' experience, and at present an employe of the G. C. & S. F. R.R. Fig. 1 shows the application of the device in a bottom plan view of the meeting ends of two cars coupled, Fig. 2 being a horizontal section and side elevation of a drawhead. Each drawhead has its hooked nose transversely recessed to receive a tongue of an adjacent coupling, preventing vertical displacement, and is adapted to receive the link of an ordinary link and pin coupling, for which a pin hole is provided. Each drawhead has an interior passage, the inner end of which has a nipple to receive the coupling device of the train pipe of an air brake system, while its outer end opens into a vertical tapering socket in the interlocking face of the hook, such faces, when engaged, forming a seat for a plug, as shown in Fig. 3, having a straightway port to make the passages continuous from car to car. The plug preferably has a metal core, surrounded by a rubber jacket or packing, and an eye by which it may be chained to the car. The shank of the drawbar is shorter than usual, and side bars, between which the drawhead is loosely secured, are bolted to the draw timbers or sills, springs being interposed on either side of the pin or key. The drawheads are close up to the dead-blocks or bumpers, so that the force of meeting cars will be largely expended on the bumpers. Only a small portion of the rear end of the drawbar is confined between the draught timbers, thus allowing the body of the car to move from one side to the other in rounding curves, while the jaws of the drawhead remain rigid, and are subjected to a straight pull all the time. For uncoupling, a push piece is arranged in a transverse cavity of the drawhead, and jointed to a lever connected by a rod with a hand lever at the side of the car. This lever may be placed in such position as the construction of the car may render convenient. It is impossible for the coupling to part

**ERVIN'S CAR COUPLING.**

by one car dropping lower than the other, and with this coupling all danger to trainmen in coupling and uncoupling is avoided.

Glycerine for a Cough.

In severe paroxysms of coughing, from whatever cause, a tablespoonful of glycerine in hot milk or cream will give speedy relief.—*Annals of Hygiene; Med. Rec.*

THE SILVER STATUE OF COLUMBUS.

Among the more remarkable exhibits at the World's Columbian Exposition is the silver statue of Columbus, which pertains to the splendid exhibits made by the Gorham Company.

The statue depicts the hero in his most important role. The figure is designed and modeled by Bartholdi, the contemporary French sculptor, who is so well and favorably known to the American people from the statue of "Liberty Enlightening the World."

As a work of art, this statue has been pronounced by

**BARTHOLDI'S SILVER STATUE OF COLUMBUS.**

connoisseurs to be a masterpiece. Life and vigor are implied in every line and feature, and the general effect is one of great beauty. Combined with this fact is the significance as being probably the largest figure ever cast in silver and the success attendant upon its conception and production. The statue is somewhat more than life size, being slightly over six feet in height and standing on a silver pedestal about a foot high. Thirty thousand ounces of sterling silver, 925-1,000 pure, was used in the casting. The finish is such as best to preserve the whole vigor and spirit of the sculptor's model rather than as a specimen of the chaser's art. The metal is finished in the oxidized form, thus allowing much more expression in light and shade effects than as though highly polished. The latter style of finish would give simply a colorless, lifeless picture, unrelieved by darker tints.

The process of casting was not essentially different from the ordinary mode of procedure in bronze, except that more care was taken in the details. The sculptor first made in clay his complete model exactly as it is to appear in the finished statue. Then a mould was taken of the model by applying a heavy layer of plaster of Paris. The plaster mould was then removed in arched sections, so that being removed they could be placed together so as to form a complete figure with the outlines on the interior. From this mould a plaster of Paris cast was made, thus reproducing in plaster the identical figure first modeled in clay. The plaster cast, covered first with a coating of shellac to prevent the absorption of moisture, was then ready for the founder, and in this form was shipped from the studio of the sculptor at Paris to the works of the Gorham Company at Providence, R. I.

At the foundry the plaster cast was first put on a soft bed of sand and covered with a layer of moulder's sand shaped into arched sections, as was the plaster mould, and a sand mould thus formed which could be taken off the cast and put together again. An outside frame of sand, beaten hard over the sections, served to keep the layer intact. After this step was completed, the sections were removed and a coating of liquid plumbago or black lead applied to the inner surfaces. The moulder's, or French sand, is of a peculiar nature, containing the qualities of a pliable clay and a coarse sand, which will allow, by its porous composition, the escape of gases generated in the interior. The lead-coated sections, after being put together, were secured by perforated iron pipes running through the figure in all directions, like a venous system. A second cast was then made from the second mould by packing the mould full of sand mixed with a flour

paste, so that the particles of sand will cohere; the sand model being held together and in place by the iron pipes which traversed the interior of the mould.

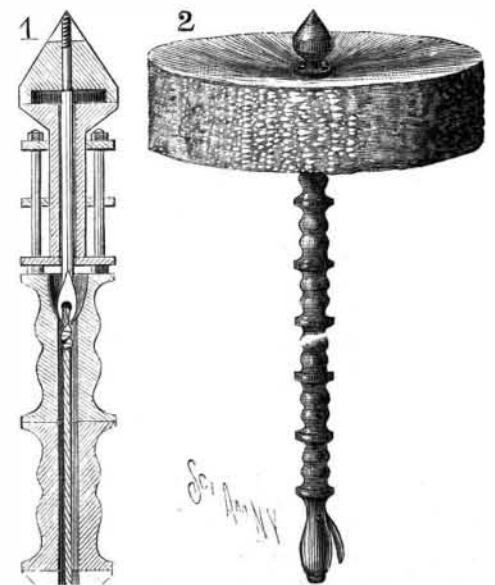
Again the sections of the sand mould were removed, the plumbago still adhering and remaining on the interior surface. The sand model or core, bared from the outside shell, was then shaved down to a depth corresponding to the thickness of metal in which the statue was to be cast, and then painted with a layer of plumbago as the interior of the shell or mould. Both shell and core were then ready for the oven, and after being subjected to a three days' bake they were dry enough for the operation of pouring. Then the sand shell was built up again over the core, and the whole fastened and held together by an iron frame. Thus the final mould for the casting consisted of the space bounded on the outside by the sand mould, giving the exact outlines of the original plaster and clay models, and on the inside by the sand core, which has been reduced in all parts, corresponding to the depth of metal to be cast. The entire mould was then covered with a heavy outside coating of sand through which channels are cut leading to all parts of the interior space. These channels are for the purpose of causing an even and rapid distribution of metal, and extend from the top or mouth of the mould where the metal is poured, through the outside layer in tortuous pipe-shaped passages to the various parts of the mould.

Four black lead crucibles containing the ton and a quarter of precious metal were placed in the furnaces after the completion of the final mould. After about four hours the molten contents of the crucibles were at a white heat and all was in readiness. One by one each crucible was lifted by a chain fall and the contents poured into a large iron bucket and thence to the huge mould buried in sand. After a few hours the casing was sufficiently cool to allow the removal of parts of it; enough to show, to experienced eyes, that the casting was practically perfect.

Thus was brought forth in almost heroic size the picture in silver of Christopher Columbus; a masterpiece of the great sculptor and a perfect exemplification of the ability of the founders to successfully overcome the difficulty of casting a life-size figure in solid silver.

A FLUE AND CHIMNEY CLEANER.

This is a simple and inexpensive device which may be readily passed into and through a chimney or flue, to clean it, its flexibly connected handle sections conforming to the shape of the flue, so that it may be introduced from a room and moved upward or downward as desired. Fig. 1 is a longitudinal section and Fig. 2 a perspective view of the device, which has been patented by Mr. William H. Bliss, of Kansas City, Mo. (Station A.) The brush section has a central eye bolt on the outer end of which is a conical cap and lock nut, the eye bolt being surrounded by a tube and three or more disks, the latter forming clamps between which the brush material is held, and the disks being drawn together by bolts provided with suitable lock nuts as shown in Fig. 1. A cord attached to the eye of the eye bolt of the brush section extends through handle sections of spool-like form, the number of sections employed varying with the length or height of the flue or chimney to be cleaned, the other end of the cord being knotted or attached to a nut on the outer

**BLISS' FLUE AND CHIMNEY CLEANER.**

end of the last section. The latter section also has a side recess in which is pivoted a cam adapted to engage the cord to hold it taut after the different sections have been put in place. In introducing the brush into a chimney or flue, the spool sections are added until the brush section has been forced practically through, when the outer handle section is added and the cord tightened, after which the cleaner is moved in or out as deemed necessary.