Oct. 11, 1932. W. J. FERRY 1,882,006

COMBINED FORM SUPPORT AND SPACER

Filed Aug. 10, 1931

Fig. 2.

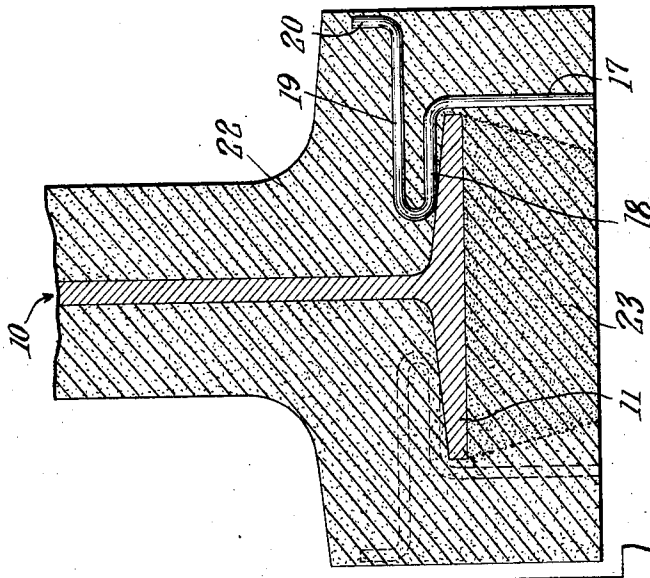
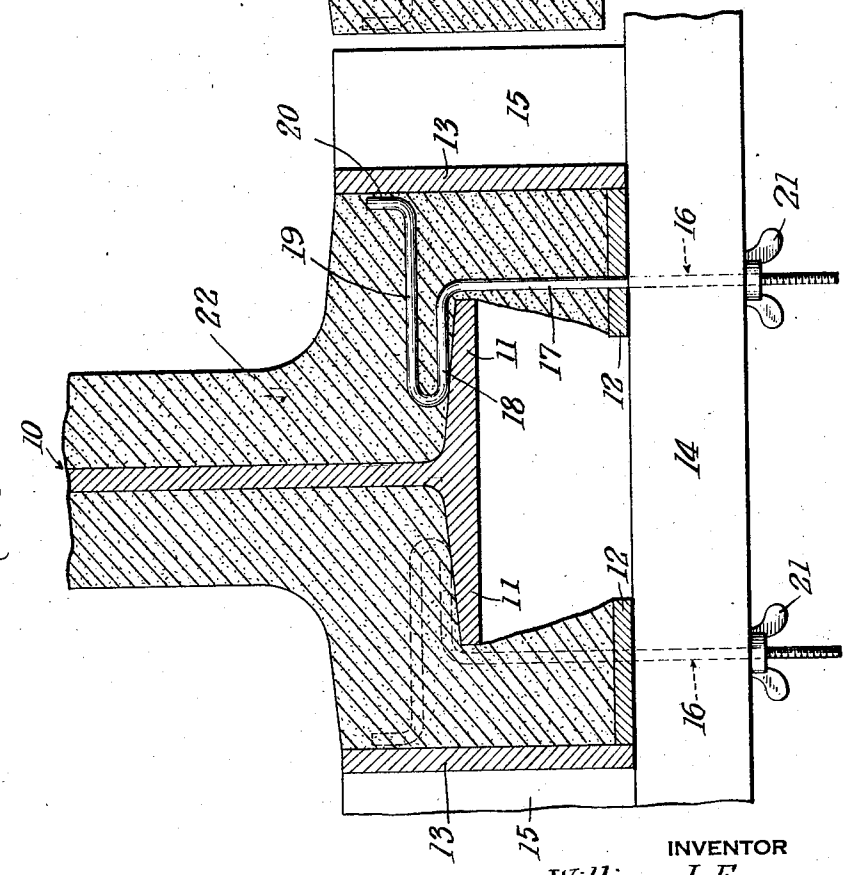


Fig. 1.



INVENTOR

William J. Ferry

BY

Louis L. Ansart

his ATTORNEY

Patented Oct. 11, 1932 1,882,006

UNITED STATES PATENT OFFICE

WILLIAM J. FERRY, OF ALLENTOWN, PENNSYLVANIA, ASSIGNOR TO CEMENT-GUN CONTRACTING COMPANY, A COMPANY OF DELAWARE

COMBINED FORM SUPPORT AND SPACER

Application filed August 10, 1931. Serial No. 556,225.

This invention relates more particularly to a combined form support and spacer for use in incasing girders or the like with cementitious material such as "gunite."

In forming a covering of "gunite" or the like, use is made of a shooting device, such as a "cement gun." A mixture of cement and sand in proper proportions is blown from the device through a nozzle where water is supplied in sufficient quantity and in such a manner as to thoroughly hydrate the cementitious material or mixture with substantially no excess of water. From the nozzle, the material is driven in a stream and at high velocity against the surface of the metal girder or other member to be covered. Under these conditions the material is pneumatically tamped to form a dense mass constituting the material above referred to as "gunite." This material adheres strongly to the metal member.

A covering of this sort is much more dense, hard and durable than one made of poured concrete or cement mortar as ordinarily applied, and can be applied without the use of the heavy and expensive forms necessary for poured concrete which forms must be built at considerable trouble, maintained until the concrete has been poured and given time to set, and then taken apart and removed. It is, however, desirable in applying "gunite" and the like to members, such as girders or I-beams, to utilize shooting strips or simple forms to assist in shaping the "gunite" especially around the flanges. If done within a few minutes after the application of "gunite", the surface thereof may be put into better shape, as, for example, by use of a screed. However, by the use of such shooting strips or forms, the area to be screeded is reduced and other advantageous results are attained.

It is an object of the present invention to provide novel form supporting and spacing devices to suspend such shooting strips or forms from the lower flanges of members such as girders or I-beams and determine their positions with reference to the edges of the flanges so as to provide for the desired thickness of covering material at said edges.

Another object of the invention is to provide a form support and spacer which is simple in structure, economical to manufacture, and efficient in use.

According to one form of carrying out the invention each form support is made of a single rod or piece of heavy and stiff wire and has a straight supporting portion designed to hang vertically when the device is in use, a flange engaging portion substantially perpendicular to said supporting portion and adapted to cooperate with the upper side of the flange, and a portion extending back along the flange engaging portion and beyond the supporting portion to an extent corresponding to the thickness of the material at the edge of the flange. The lower end of the supporting portion is intended to cooperate with a fastening device, such as a nut, and, for this purpose is screw-threaded.

Other objects and advantages will appear upon consideration of the following description and of the drawing in which:

Fig. 1 is a fragmentary sectional view illustrating one embodiment of the invention in use and showing the portions of the covering at the lower flange of the I-member as shaped by the use of a form; and

Fig. 2 is a similar view with the form removed, the downwardly projecting portions of the rods cut off and the gap at the lower side of the lower flange filled with material after the removal of the shooting strips or forms.

Referring to the drawing, 10 designates a support in the form of an I-beam of which only the lower part is shown. At each side of the central web and at its lower edge are flanges 11 extending in opposite directions. The form or shooting strip for the edge of each flange 11 is made of a horizontally positioned member or board 12 and a member or board 13 arranged vertically with its lower edge extending along the corresponding board and preferably at the outer edge thereof. Both of the boards 12 and 13 are supported from below by cross pieces 14 and the boards 13 are supported at their outer sides by uprights 15 suitably fastened to the cross pieces 14. It should be understood that the uprights 15 on each cross piece 14 are spaced

in accordance with the width of the flanges at the lower edge of the beam and the thickness of the "gunite" to be applied at the edges of the flanges.

According to the preferred embodiment of the form support and spacer, each device 16 of this kind is made of a single piece of rod or stiff wire having a straight tension or supporting portions 17 screw-threaded at its free end, a flange engaging portion 18 substantially perpendicular to the tension portion 17 at its upper end, and a spacer portion 19 turned back along the portion 18 and extending beyond the supporting portion 17 to engage one of the members or boards 13. Preferably, the portion 19 of this device has a bent-off end or head 20 to engage a board 13.

Preferably the I-beam 10 is prepared for the application of "gunite" thereto by attaching to the beam means for reinforcing the "gunite" such as metal mesh or fabric (not shown).

In order to use the devices 16 to support the shooting strips, holes to accommodate the tension portions of these devices are provided in each cross-piece and are spaced slightly farther apart than the outer edges of the lower flanges. In attaching the shooting strips to the beam 10, the form structure may be placed in position and then secured to the beam by placing the devices 16 in position with their portions 17 projecting downwardly through the boards 12 and cross pieces 14, and applying wing nuts 21 to the threaded lower ends of portion 17. Obviously the devices 16 may be placed in the cross pieces 14 before the form structure is placed in position. Then by turning each device 90° from its normal position, and by raising the form the upper ends of the devices 16 would pass on opposite sides of the flanges 11. Then the devices could be turned to their normal positions and the wing nuts 21 adjusted as desired.

It will be evident that the form or shooting strip assemblage is supported by the wing nuts 21 and the tension portions 17 of the devices 16, and is held against transverse movement with respect to the beam 10 by engagement of the ends 20 of the spacer portions 19 with the members or boards 13.

Although, as previously described, the boards 13 and uprights 15 may be attached to the cross pieces 14 before the form assemblage is attached to the beam, they may be applied after the rest of the form assemblage has been suspended from the flanges 11.

After the form assemblage has been attached to the beam, the covering material is blown into place forming a deposit of "gunite" 22 as indicated in Fig. 1. It will be noted that a gap is left beneath the beam and between the boards or strips 12. This gap is of service to avoid sand pockets and to get "gunite" of the proper quality. After the shooting strip assemblage is removed, the gap is filled with an additional deposit 23 of "gunite". The tension portions 17 of the devices 16 are cut off at the lower surface of the "gunite" deposit 22, as indicated in Fig. 2.

Preferably the boards or strips 12 below the level of the flanges 11 extend inwardly beneath the flanges and the "gunite" deposit 22 is formed with faces sloping downwardly and inwardly from the edges of the flanges 11 to the inner edges of the strips 12. The gap thus provided between these surfaces is in the form of a dovetail mortise or groove and assists in holding in place the later "gunite" deposit 23.

It will be evident that the present invention provides very advantageous means for supporting and positioning shooting strips adjacent to the flanges at the lower edge of a member, such as a girder or I-beam, and that when the covering for the lower part of such member is applied in the general manner described such covering is of good quality.

It should be understood that the disclosed embodiment of the invention is merely illustrative thereof and that various changes may be made and certain features used with others without departing from the true spirit and scope of the invention.

Having thus described my invention, I claim:—

1. The combination with a beam or the like having a laterally extending flange and a shooting strip having a part below said flange and a part opposite the edge of the flange to determine the thickness of a covering of "gunite" or the like at the edge of the flange, of a one-piece device of wire or the like having a vertical portion with provisions at its lower end for attachment to the shooting strip to support the same, a laterally offset portion adapted to extend over and engage the upper surface of the flange, and a spacer portion extending from the farther end of said laterally offset portion backwardly along the same and beyond said vertical portion to engage the inner surface of the part of the shooting strip opposite the edge of the flange and properly position such part.

2. A combined form support and spacer of the character described, comprising a single piece of wire or the like having a straight portion provided with a screw-thread at one end, a portion bent off from said straight portion and substantially perpendicular thereto, and a portion bent back from the second mentioned portion and extending beyond said straight portion, the third mentioned portion having its free end bent to one side to provide a head.

3. The combination with a beam or the like having oppositely extending flanges at the lower edge thereof and a shooting strip assembly for use in incasing said flanges with

"gunite" or the like and including at each edge a bottom-forming member and an edge-determining member; of means for supporting said shooting strip assembly and determining the thickness of the covering at the edges of the flanges, including a rod having a vertical tension portion secured to the shooting strip assemblage below the beam, a flange-engaging portion extending to one side over one of said flanges and resting thereon, and a spacer portion extending from the flange-engaging portion back along the same and beyond the vertical tension portion into engagement with the edge determining member.

4. The combination with a beam or the like having flanges extending in opposite directions from the lower edge thereof and a shooting-strip assembly including a bottom-forming member and an edge-forming member at each side and transverse conductors between the bottom-forming members and edge-determining members at opposite sides; of a plurality of unitary combined supporting and spacing devices at opposite sides of the beam, each of said devices including an inwardly extending flange-engaging part overlying the flange at the corresponding side of the beam, a part extending downwardly from the flange and connected with one of said transverse connectors to support the same and to hold the flange-engaging part over the flange, and a part extending outwardly from the flange-engaging part and engaging the corresponding edge-determining member.

In witness whereof, I affix my signature.

WILLIAM J. FERRY.