March 15, 1960 G. R. WHITE 2,928,556

WALL HOISTER

Filed Dec. 24, 1957 2 Sheets-Sheet 1

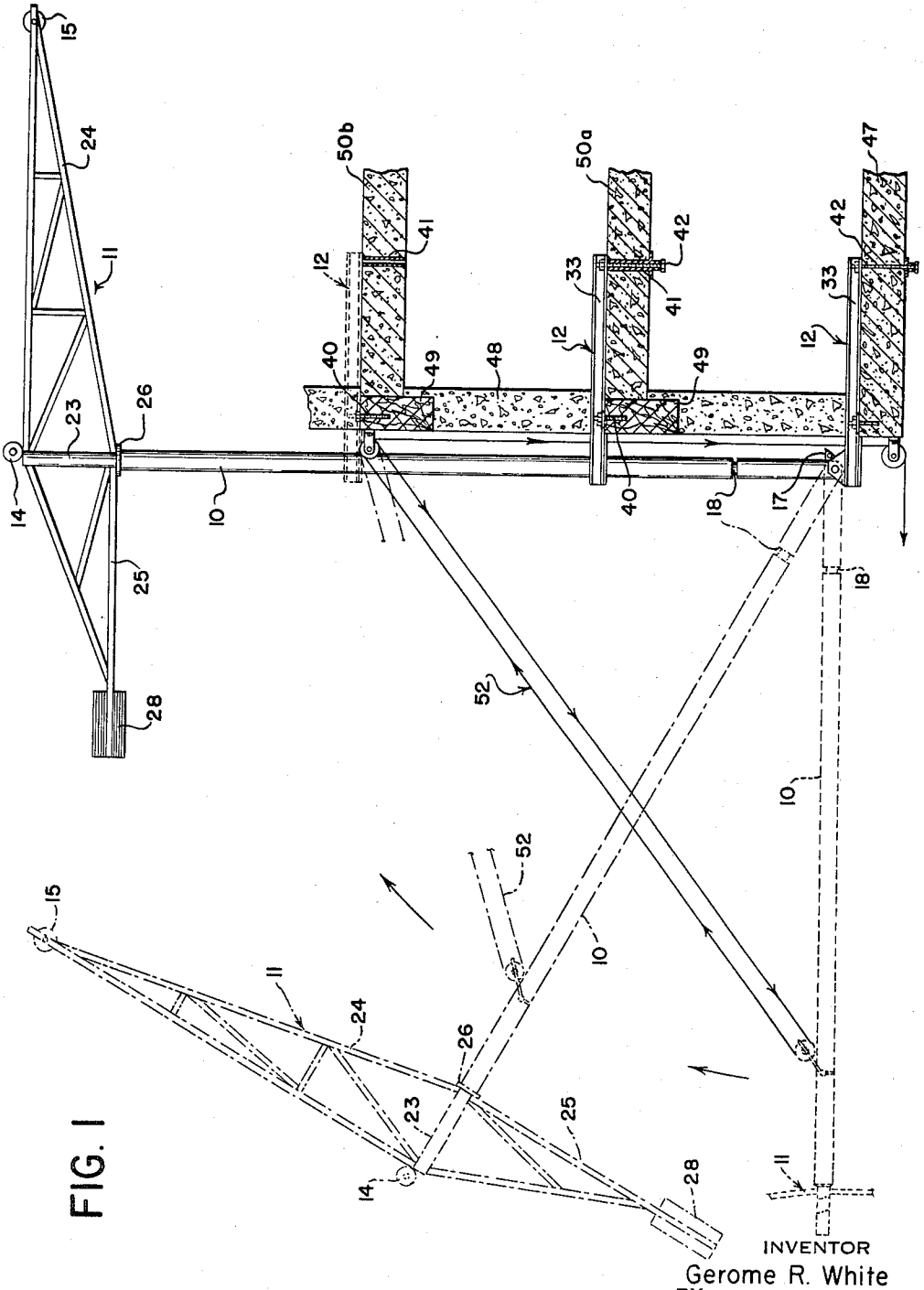


FIG. 1

INVENTOR
Gerome R. White
BY
Pennie, Edmonds, Morton, Barrows & Taylor
ATTORNEYS

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FIG. 2

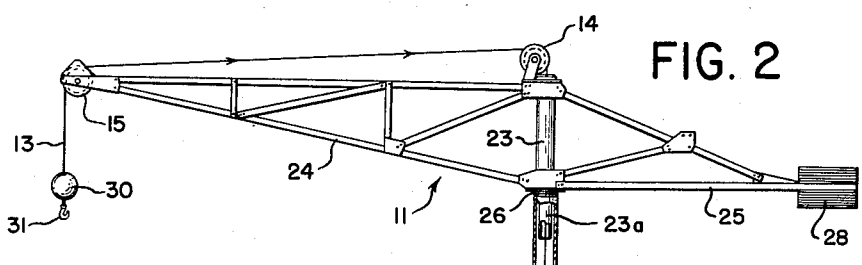
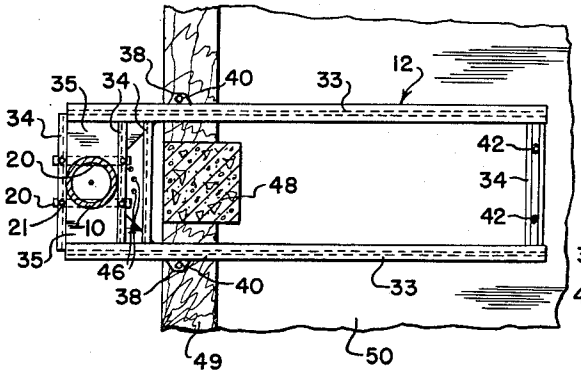


FIG. 3



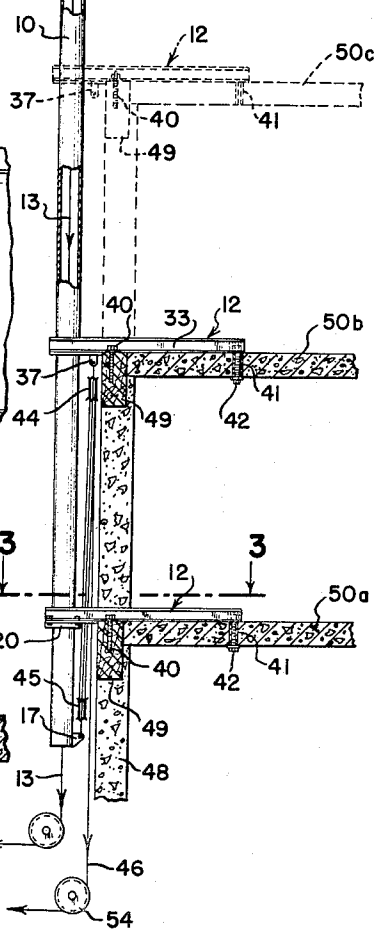


FIG. 4

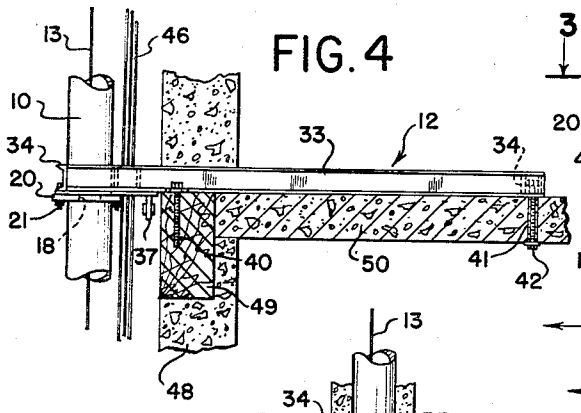
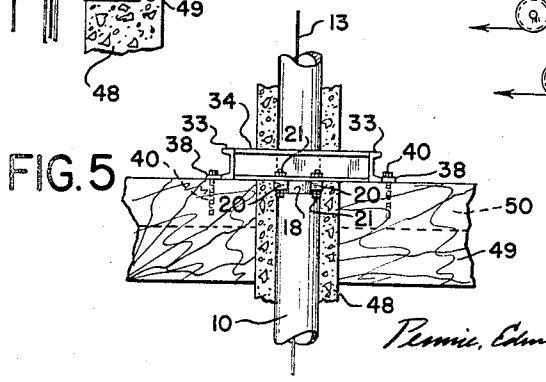


FIG. 5



INVENTOR
Gerome R. White
BY
Pennie, Edmonds, Morton, Barrow & Taylor
ATTORNEYS

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WALL HOISTER

Gerome R. White, Englewood, N.J., assignor to United Hoisting Company, Englewood, N.J., a partnership

Application December 24, 1957, Serial No. 704,921

1 Claim. (Cl. 212—64)

This invention relates to hoisting devices, and in particular it relates to a wall hoister that can be mounted on the outside of a building under construction by means of support members fastened temporarily to the completed upper floors of the building and that is adapted to be raised upwardly floor by floor as construction of the building progresses.

The erection of tall buildings, say buildings over three or four stories high, requires the use of some type of temporary hoisting device to raise building materials from the ground level to the upper floors of the building then under construction. These hoisting devices assume many forms such as independent truck or track-mounted cranes, temporary elevator structures erected within or on the exterior of the building, guyed derricks mounted on the steel framework of the building, and the like. Such hoisting devices, however, generally speaking are expensive to procure and are complicated to erect, operate and dismantle. In addition, the majority of such temporary hoisting devices require the use of stabilizing guy cables which necessarily extend over a wide area and hence are very much in the way of the construction activity. This problem is especially acute when the building being erected is of reinforced concrete construction wherein large quantities of concrete forms, reinforcing materials and concrete mix must be raised to the floor or level of the building then under construction, and particularly as this type of construction does not lend itself readily to the installation of the usual derrick guy cables.

I have now devised an improved portable hoisting device adapted to be mounted on the outside of a building under construction by means of support members temporarily fastened to the completed upper floors of the building and adapted to be raised upwardly floor by floor as construction of the building progresses. My new wall hoister is relatively simple to erect and to operate, and it does not require the use of supplementary guy cables to stabilize the device. Accordingly, it is particularly useful in the erection of reinforced concrete buildings. The wall hoister of my invention comprises a vertically disposed pintle member and a horizontally disposed hoist arm rotatably mounted on the upper end of the pintle member. At least two pintle supports detachably mounted in vertical alignment on adjacent floors of the building under construction are adapted to releasably engage and support the pintle member in a substantially vertical position at a point on the outside of the building such that the horizontal hoist arm is disposed above the level of the floor of the building then being laid. A hoist cable is provided one end of which is connected to a hoist winch and the other member of which is reeved through the pintle member and over a sheave disposed at one end of the horizontal hoist arm. Pintle raising means are also provided which are connected to the upper pintle member support and to the tubular pintle adjacent the lower end thereof, the pintle raising means being adapted to raise the wall hoister vertically from the level of one floor

to the level of the floor next above upon completion of the said floor then being laid.

The wall hoister of my invention will be better understood from the following description of an advantageous embodiment thereof in conjunction with the accompanying drawings of which:

Fig. 1 is a side elevation of the wall hoister being erected and placed in position for use;

Fig. 2 is a side elevation of the wall hoister in position on the uppermost of the completed floors of the building in position to be used for the construction of the floor next to be laid;

Fig. 3 is a section along line 3—3 of Fig. 2 showing the details of construction of one of the pintle supports;

Fig. 4 is a side elevation of the pintle support shown in Fig. 3; and

Fig. 5 is a front elevation of the pintle support shown in Figs. 3 and 4.

As shown best in Figs. 1 and 2 of the drawings, the wall hoister of my invention is a portable, wall-mounted device which comprises, broadly, a vertically disposed tubular pintle **10**, a horizontally disposed hoist arm **11** rotatably mounted on the upper end of the pintle **10**, pintle supports **12** adapted to be detachably mounted on the completed upper floors of a building under construction and further adapted to releasably engage and support the vertical tubular pintle **10**, a hoist cable **13** and associated hoist cable sheaves **14** and **15**, and means for raising the wall hoister from the level of one floor of the building to the level of the floor next above as construction of the building progresses.

The vertically disposed pintle **10** advantageously is fabricated from heavy duty steel pipe or tubing of sufficient length so that when it is mounted on the completed upper floors of the building under construction the hoist arm **11** will be positioned above the level of the floor of the building then being laid, and of sufficient strength to withstand the bending and other forces to which the pintle **10** will be subjected when the wall hoister is in use. The tubular pintle **10** is provided with a lifting eye **17** secured thereto at the lower end thereof, and is further formed with a recessed portion **18** adjacent the lower end thereof. The recessed portion **18** of the pintle **10** is adapted to receive a pintle mounting member which, in turn, is adapted to secure the pintle **10** to one of the pintle supports **12**. In the embodiment of the invention shown in the drawings, the pintle mounting member comprises a pair of mounting bars **20** which fit into the recessed portion **18** of the pintle and which are secured by means of bolts **21** to the underside of the lowermost of the pintle supports **12**.

The horizontally disposed hoist arm **11** advantageously comprises a hollow center post **23** from which extend in opposite directions two cantilever arm portions **24** and **25**. The lower portion **23***a* of the hollow center post **23** is adapted to fit into the open upper end of the tubular pintle **10**, and washers or bearing surfaces **26** are provided between the upper end of the pintle **10** and the hoist arm **12** to facilitate rotation of the hoist arm in a full circle around the upper end of the vertical pintle. A first sheave **14** is mounted on the upper surface of the hoist arm **11** in position so that the cable-carrying groove of the sheave **14** is in line with the vertical or longitudinal axis of the center post **23** and the tubular pintle **10**. A second sheave **15** is mounted at one end of the horizontal hoist arm **11**, and a counterweight **28** is advantageously mounted on the other end of the hoist arm **11**. The hoist cable **13** is reeved through the tubular pintle **10** and the hollow center post **23** and extends over the first and second sheaves **14** and **15** as shown in Fig. 2 of the drawing. The end of the hoist cable **13** depending from the second sheave **15** is connected to a conventional

iron ball **30** and hook **31**, and the other end of the hoist cable is connected to a hoist winch (not shown).

As shown best in Figs. 3, 4 and 5 each of the pintle supports **12** advantageously comprises two longitudinal frame members **33** connected by a plurality of lateral frame members **34**. One end of the pintle support **12** (hereinafter referred to as the outboard end thereof) is adapted to engage the tubular pintle **10** and, in conjunction with the other pintle supports, maintain the pintle **10** in its normally vertical position adjacent the outside of the building under construction. In the embodiment of the invention shown in the drawings the outboard end of the pintle support is provided with a pair of demountable yoke or clamp members **35** which, when assembled as shown best in Fig. 3, firmly grasp the tubular pintle **10**. The outermost of the lateral frame members **34** are demountable or removable so that the pintle support **12** can be positioned about a vertical column of the building as shown in Figs. 3, 4 and 5, and so that the demountable clamp members **35** can be positioned about the pintle **10** as shown in Fig. 3. The two outermost of the lateral frame members **34** are also adapted to support the pintle mounting member hereinbefore referred to—namely, the two mounting bars **20** shown in Figs. 2 through 5 of the drawings. The pintle support **12** is further provided with a dependent lifting eye **37** and with laterally extending tie-down eyes **38**.

The pintle supports **12** are secured to the completed floors of the building under construction by means of pintle support fastening members integrally formed or built in the floors of the building when these floors are laid or constructed. In the embodiment of the invention shown in the drawings the pintle support fastening members comprise a plurality of bolts or studs, or their equivalent, embedded in the floor when it is laid. Specifically, two bolts or studs **40** are embedded in the floor (or floor beam) near the outer wall of the building under construction and are carefully positioned to be received in the tie-down eyes **38** of the pintle support **12**. In addition, two tubes or lengths of pipe **41** adapted to receive bolts **42** are embedded in the floor in a position such that the bolts **42** can be secured to the inboardmost of the lateral frame members **34** of the pintle support **12**. The pintle support fastening means, of which the bolts **40** and **42** are an advantageous example, are located in each floor so that they are all in vertical alignment with each other. As a consequence, the pintle supports **12** secured thereto are also in vertical alignment with each other.

The wall hoister is further provided with means for raising the pintle **10** and horizontal hoist arm **11** mounted thereon from the level of one floor of the building under construction to the level of the floor next above as construction of the building progresses. As shown in Fig. 2, the pintle raising means advantageously comprises a block and tackle arrangement the upper block **44** of which is attached to the dependent lifting eye **37** of the uppermost of the pintle supports **12** and the lower block **45** of which is attached to the lifting eye **17** of the pintle **10**.

Although the wall hoister of my invention can be employed in the erection of any type of multi-story building it is particularly useful in the construction of reinforced concrete buildings, and the setting-up and operation of the wall hoister will be described in connection with the erection of such a building.

In general, in the erection of a reinforced concrete building a suitable foundation is first prepared and the ground floor **47** of the building is then laid. The erection of the building then proceeds floor by floor with the supporting columns **48** of each floor first being poured or constructed, followed by the construction or laying of the floor beams **49** and the floor **50** itself. After the lower two or three floors of the building are completed the wall hoister is laid flat on the ground adjacent thereto as indicated by the dotted lines in Fig. 1, and the bottom end of the tubular pintle **10** is temporarily pivotally connected to one of the pintle supports **12** secured to the ground floor **47** of the building by means of the aforementioned bolts **40** and **42**. A block and tackle **52** temporarily connected to the side of the building and to the tubular pintle **10** as shown in Fig. 1 is employed to raise the pintle **10** and horizontal hoist arm **11** to their normal operating position on the outside of the building shown by solid lines in Fig. 1. A second pintle support **12** is then fastened to the second floor **50***a* of the building by means of the aforementioned bolts **40** and **42**, and the demountable clamp members **35** thereof are assembled about the tubular pintle **10** so that they engage the tubular pintle as previously described and thus maintain the wall hoister in its said operating position. The block and tackle **52** employed to erect the wall hoister is then removed.

A third pintle support **12** indicated by dotted lines in Fig. 1 and shown by solid lines in Fig. 2 is then fastened to the third floor **50***b* of the building by means of the aforementioned pintle support fastening member, and the demountable clamp members **35** are secured about the tubular pintle **10** as previously described. The aforementioned pintle raising means is then attached to the lifting eye **17** of the pintle **10** and to the dependent lifting eye **37** of the said third pintle support **12**, and the cable **46** of the said pintle raising means is led by the guide pulley or sheave **54** to the hoist winch or equivalent device (not shown). The temporary pivoted connection between the bottom of the pintle **10** and the said first pintle support **12** is removed, and the pintle raising means then raises the wall hoister upwards to the point at which the pintle mounting bars **20** can be inserted in the recessed portion **18** of the pintle **10** and be bolted to the underside of the said second pintle support **12**. The wall hoister is now in condition to be employed in the further construction of the building.

The vertical supporting columns **48**, the floor beams **49** and the floor **50** of the next story of the building (say, the fourth floor **50***c*) is then constructed with the aid of the wall hoister. When the floor beam **49** and the floor **50** are being laid the bolts **40** and the tubes **41** of the pintle support fastening member are carefully positioned and embedded therein when the concrete is poured. After the concrete has hardened and the laying of the floor is completed, a fourth pintle support **12** (or, advantageously, the said first pintle support **12** which has been removed from the ground floor **47**) is fastened to the said fourth floor **50***c* as indicated by the dotted lines in Fig. 2 of the drawing. The clamp members **35** of the fourth pintle support are fastened about the tubular pintle **10** as before, and the upper block **44** of the pintle raising means is transferred from the lifting eye **37** of the said third pintle support **12** to the lifting eye **37** of the said fourth pintle support to prepare for raising the wall hoister up into position to be used for the construction of the next story or level of the building.

To raise the wall hoister up to the next level of the building, a strain is taken on the cable **46** of the pintle raising means in order to support the weight of the tubular pintle **10** and the horizontal hoist arm **11**, the pintle mounting members or bars **20** are unbolted and removed from the lowermost pintle support **12** (i.e., the said second pintle support **12**), the pintle **10** is raised by means of the said pintle raising means to the level of the floor next above, and the pintle **10** is again secured to one of the pintle supports **12** (i.e., the said third pintle support **12**) by means of the mounting members or bars **20**.

The foregoing procedure is repeated as construction of the building progresses until finally the uppermost floor of the building is completed. After the building is completed and there is no further need for the wall hoister, the wall hoister is dismounted from the wall of the building and lowered to the ground by an auxiliary block and tackle or some equivalent hoisting device.

From the foregoing, it will be seen that I have developed an important improvement in hoisting devices adapted to be mounted on buildings under construction and to be raised floor by floor as construction of the building progresses. Moreover, due to the fact that my novel wall hoister is mounted directly on the completed upper floors of the building and that it does not require the use of extraneous guy cables, the wall hoister is particularly useful in the erection of buildings constructed of reinforced concrete.

I claim:

A wall hoister adapted to be mounted on the outside of a building under construction by means of support members fastened temporarily to the completed upper floors of the building and to be raised floor by floor as construction of the building progresses, the wall hoister comprising a vertically disposed tubular pintle, a horizontally disposed hoist arm rotatably mounted on the upper end of the tubular pintle, said hoist arm having a hollow center post journalled in the upper end of the tubular pintle, a first hoist cable sheave mounted on the horizontal hoist arm above and in line with the vertical axis of said tubular pintle, a second hoist cable sheave mounted on one end of the horizontal hoist arm, a counterweight mounted on the other end of the hoist arm, a hoist cable one end of which is connected to a hoist winch and the other end of which is reeved through the tubular pintle and hollow center post and over said first and second sheaves, a pintle support fastening member integrally formed in each completed floor of the

building, said pintle support fastening members being disposed in said floors in vertical alignment with each other and immediately adjacent a vertical column of the building, at least two pintle supports detachably mounted on said pintle support fastening member on adjacent upper floors of the building, each of said pintle supports comprising two longitudinal frame members disposed on either side of the said vertical column of the building and connected by a plurality of lateral frame members, the outboard ends of said longitudinal frame members extending outside the wall of the building and being adapted to releasably engage and support the tubular pintle, said pintle supports releasably engaging and supporting the tubular pintle in a substantially vertical position at a point on the outside of the building such that the horizontal hoist arm is positioned above the level of the floor of the building being laid, and pintle raising means connected to the upper pintle support and to the pintle adjacent the lower end thereof, said pintle raising means being adapted to raise the pintle vertically from the level of one floor to the level of the floor next above upon completion of said floor then being laid.

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