June 11, 1940. R. E. McINTOSH 2,204,373

METHOD OF MAKING AND ASSEMBLING EXPANSION SHIELDS

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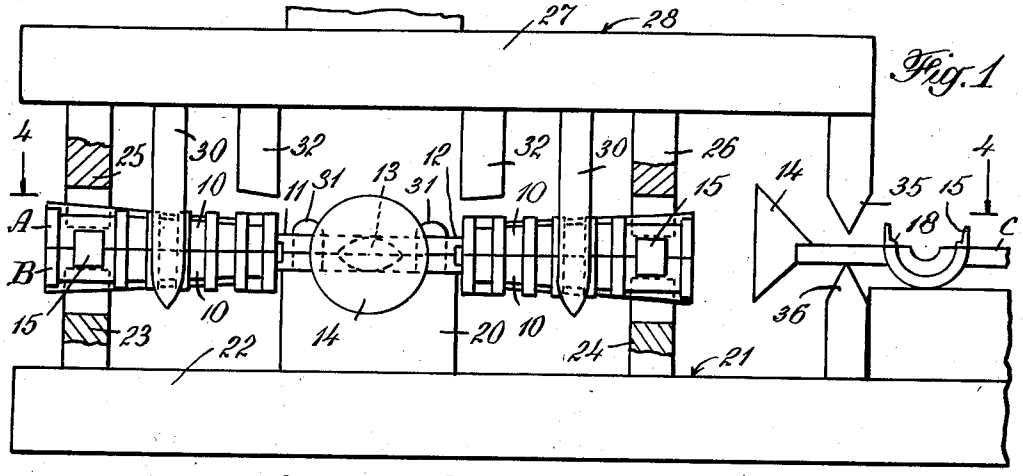


Fig. 1

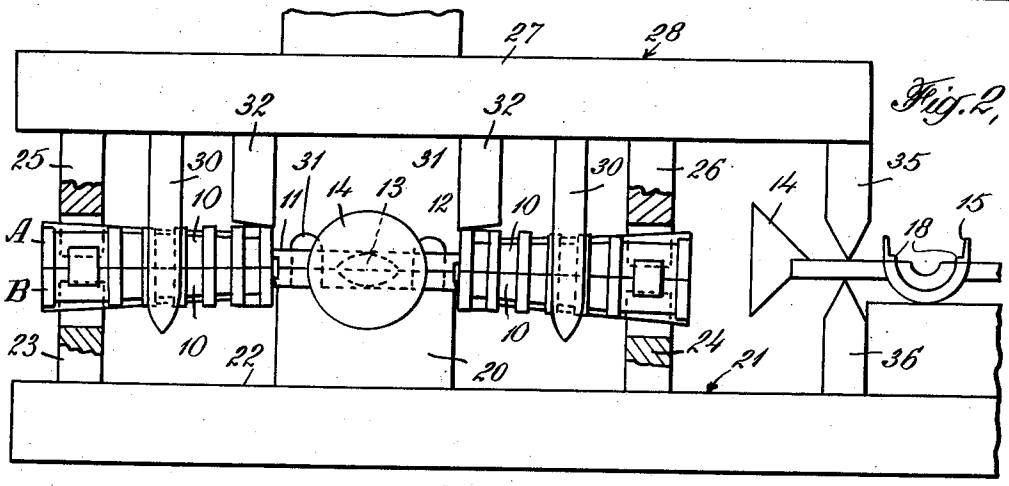


Fig. 2

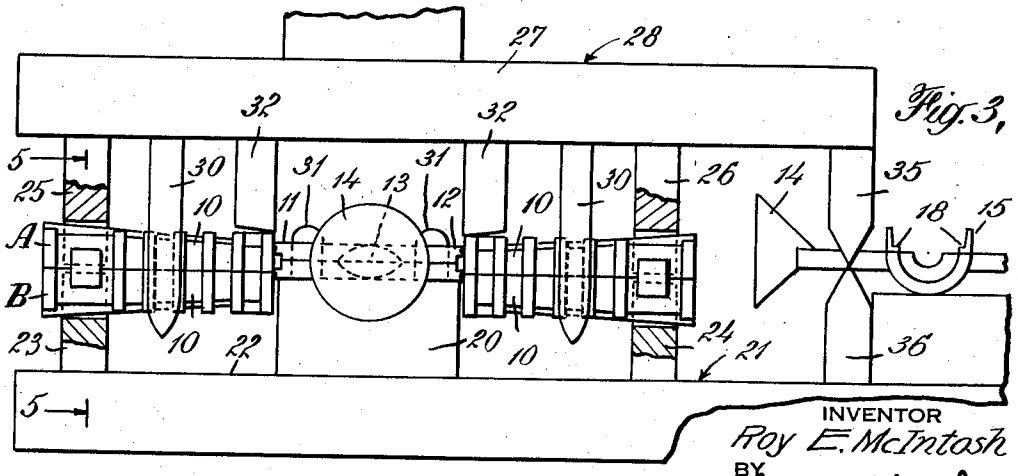


Fig. 3

INVENTOR
Roy E. McIntosh
BY
Marshall & Hurley
ATTORNEYS

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Fig. 4.

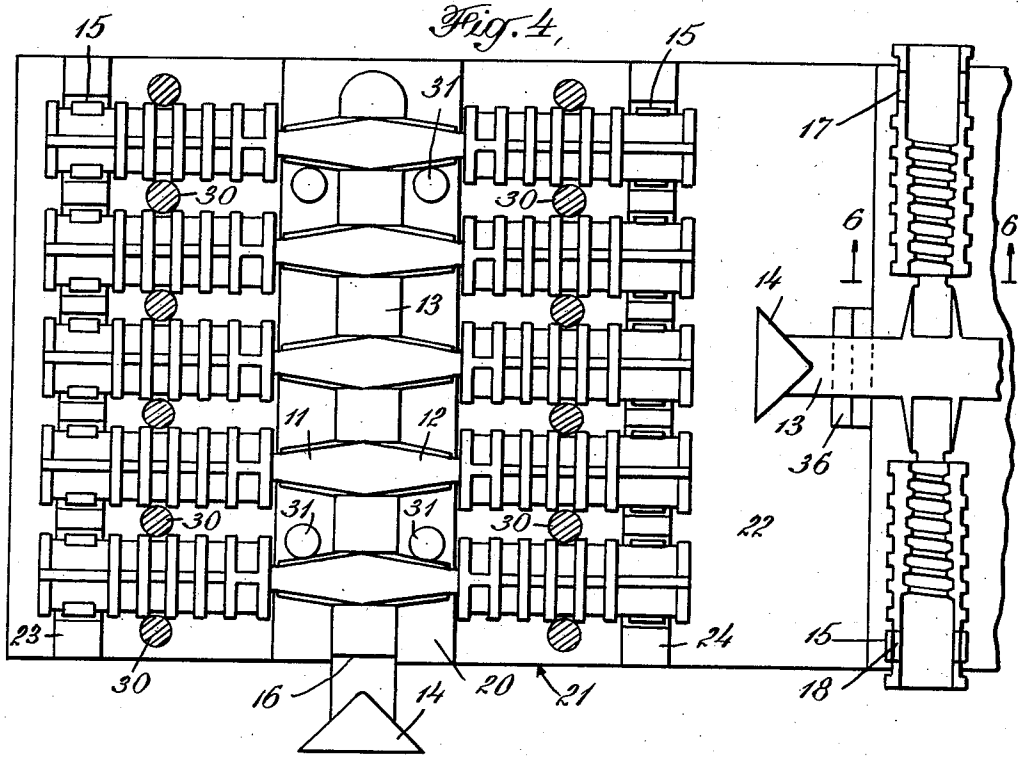


Fig. 5.

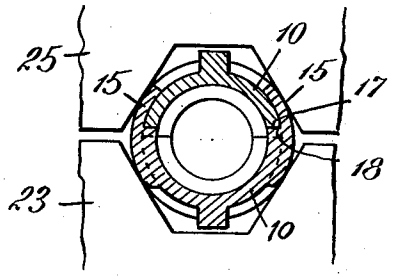


Fig. 6.



INVENTOR
Roy E. McIntosh
BY
Marshall & Hawley
ATTORNEYS

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Fig. 7,

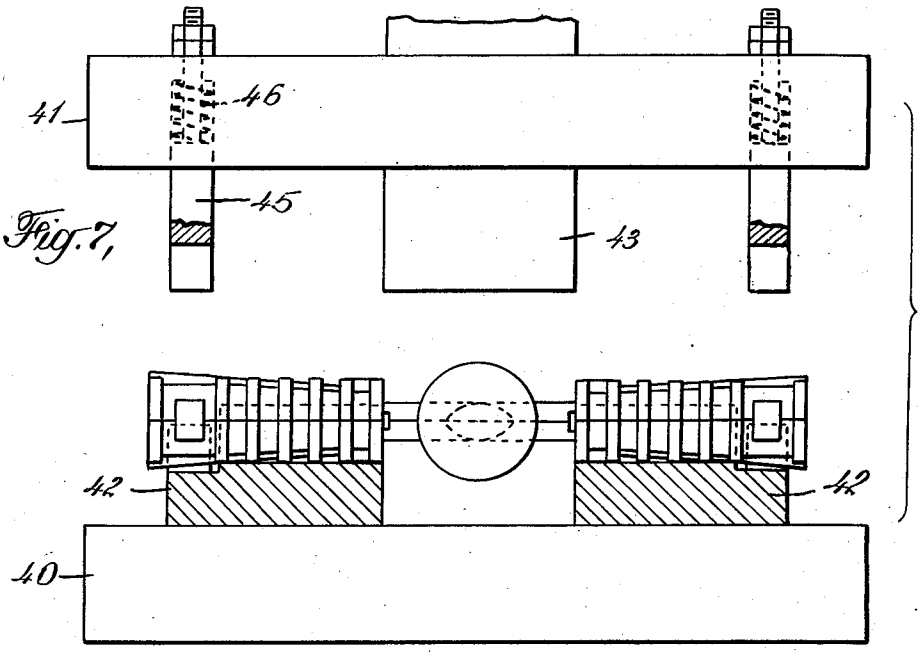
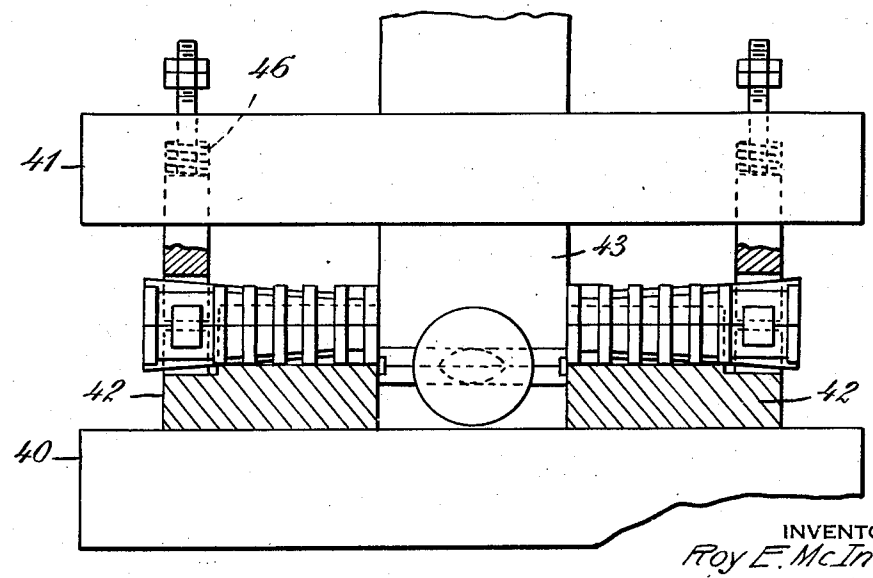


Fig. 8



INVENTOR
Roy E. McIntosh
BY
Marshall Hawley
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,204,373

METHOD OF MAKING AND ASSEMBLING EXPANSION SHIELDS

Roy E. McIntosh, New York, N. Y., assignor to Star Expansion Bolt Company, New York, N. Y., a corporation of Illinois

Application September 7, 1938, Serial No. 228,759

8 Claims. (Cl. 29—148.2)

This invention relates to a method of making and assembling expansion shields.

More particularly stated, the invention relates to expansion shields of the type comprising a pair or a plurality of complementary sections which are laterally expansible into gripping engagement with a wall opening.

Such shields as now manufactured are made or cast in individual sections in poured molds and the sections are assembled manually to form the completed expansion shields.

This invention has for its salient object to simplify the making and assembling of expansion shields of the character described thereby cutting down the number of operations required.

Another object of the invention is to provide a simple, practical and efficient method or process of economically manufacturing shields of the character described.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which

Fig. 1 is an elevation partly in section illustrating one form of apparatus for carrying out the method, the parts being shown with the two sections of the press separated prior to the operation thereof;

Fig. 2 is a view similar to Fig. 1 showing the two parts of the press in an intermediate position before the assembling operation has been completed;

Fig. 3 is a view similar to Figs. 1 and 2 but showing the two parts of the press in closed position after the press has completed the assembling operation;

Fig. 4 is a plan view partly in section taken substantially on line 4—4 of Fig. 1 looking in the direction of the arrows;

Fig. 5 is an enlarged sectional elevation taken substantially on line 5—5 of Fig. 3;

Fig. 6 is an enlarged sectional elevation taken substantially on line 6—6 of Fig. 4;

Fig. 7 is a view similar to Fig. 1 but illustrating a slightly modified form of apparatus adapted for use in carrying out the method, the two parts of the press being shown in separated position; and

Fig. 8 is a view similar to Fig. 7 but showing the two parts of the press closed.

The invention briefly described consists of a method of and apparatus for making and assembling sectional expansion shields comprising a pair or a plurality of complementary sections. The shield sections are first cast, preferably by die casting in a group of interconnected units, the units being connected by casting sprues. The sprue head on one of the castings is severed and the castings are assembled with one superposed on the other to bring the complementary sections into assembling position. The superposed castings are then placed in a press, one portion of the press having means for supporting the castings and the other portion of the press having means for guiding or truing up the sections, means for severing the sprues from the sections and the two portions of the press having coacting means for causing the shield securing means carried by one set of the shield sections to embrace and secure the said sections to the complementary sections.

The method briefly stated consists of making and assembling expansion shields comprising a pair or a plurality of complementary shield sections which are cast in interconnected groups, certain of the sections having embracing means or securing lugs engageable with other sections, assembling the interconnected groups of complementary sections, severing the connecting portions of the assembled sections and causing the embracing or holding lugs on one group of sections to embrace and engage the other sections.

Further details of the invention will appear from the following description.

In the particular embodiment of the invention illustrated in Figs. 1–6 inclusive, there is shown a pair of interconnected groups of castings A and B, each group comprising a plurality of half sections 10 which are connected together by laterally extending sprues 11 and 12 and what may be termed longitudinal sprues 13 which communicate with the lateral sprues 11 and 12 and extend through the inlet gate opening of the mold to form sprue heads 14.

In the form of the invention illustrated, some of the sections 10 have formed thereon adjacent one end thereof and at the edges, lugs 15, 15 which are adapted to embrace and engage the complementary sections and secure the sections together in the manner shown particularly in Fig. 5.

These lugs are normally open, as shown at the right in Figs. 1–3 inclusive.

If desired, all of the sections in one interconnected group may have lugs formed thereon and the complementary group have none, or, as shown at the right of Fig. 4, the lugs may be on the sections at one side of the group, whereas those on the other side of the same group have

none. A similar group, made from the same dies, when reversed and superposed will be interfitting. The latter is the preferred structure. Other interfitting arrangements of the lugs are possible.

In order to superpose one interconnected group of sections upon the other, one of the sets must have the sprue head 14 severed, this being the upper set illustrated in Figs. 1–6, the severed end of the longitudinal sprue being shown at 16.

In order to assist in properly alining the complementary superposed sections, certain of the sections are formed with recesses 17 which receive projections 18 on the complementary sections. See Figs. 1, 4 and 5.

After the groups have been assembled in the manner described, or one group has been superposed on the other, the superposed groups are placed on an anvil 20 of a press section 21. The section 21 has also formed thereon and extending upwardly from the base 22 a pair of V-blocks 23 and 24 which, as shown in Fig. 5, coact with V-blocks 25 and 26 carried by the head 27 of an upper press section 28. These two sets of V-blocks engage the lugs 15, 15 and close the lugs, causing them to embrace the corresponding portions of the complementary sections and thus secure the sections together.

The press section 28 has also formed thereon and extending downwardly therefrom guide rods 30 which, as shown in Fig. 4, coact with circumferential annular grooves in the shields to guide the shield sections and to properly position them in assembled relation.

The anvil 20 has formed thereon and extending upwardly therefrom cylindrical studs 31, 31 which engage the inner surfaces of the outer sets of lateral sprues 11 and 12 to properly position the sprues on the anvil 20.

The head 27 of the upper press section 28 has extending downwardly therefrom bars 32, 32 which as the upper section is lowered are adapted to engage the inner end portions of the assembled shield sections and as the press section 28 moves downwardly to sever the inner ends of the assembled shield sections from the connecting sprues 11, 12. This action is illustrated in Figs. 1–3 inclusive. In Fig. 2 the bars 32, 32 have moved downwardly into engagement with the inner end portions of the assembled shield sections or of the upper sections and downward pressure is being exerted. In Fig. 3 the severing of the sprues has been completed by the continued downward movement of the breaker bars 32, 32. In this figure also as shown in Fig. 5, the upper and lower V-blocks have cooperated in closing the lugs 15, 15 or causing these lugs to embrace the lower shield sections.

In addition to using the apparatus and method to assemble the complementary shield sections, the two sections of the press 21 and 28 are also provided with means in the form of V-shaped knives 35 and 36 carried respectively by the press head 27 and the press base 22 for severing the sprue head of another interconnected group of sections shown at C. The action of the knives 35 and 36 is shown in Figs. 1–3 inclusive, and from the showing in Fig. 3 it will be seen that as the upper section of the press reaches its closed position the severing of the sprue head has been completed.

It should be understood that the method of making and assembling complementary shield sections is not limited to the use of the apparatus shown in Fig. 1, and Figs. 7 and 8 show a modified form of apparatus which may be used. In these figures are shown a pair of press members or sections 40 and 41. The press section 40 has formed thereon supports 42, 42 for supporting the shield sections of the lower interconnected group. The upper section 41 of the press has extending downwardly therefrom a centrally disposed severing bar or block 43 which is adapted to engage the sprues 11, 12 and sever the sprues from the shield sections as the press member 41 moves downwardly.

The two press members 40 and 41 are also provided with V-blocks to close the lugs 15, 15, similar to the V-blocks shown in Fig. 5, but in this case the upper V-block 45 is slidably mounted in the press section 41, but is pressed downwardly by a spring 46. This permits the V-blocks to move to closed position, such as the position shown in Fig. 5, and to close the lugs 15, 15 prior to the severing action of the block 43 on the sprues 11, 12.

Although certain specific embodiments of the invention have been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit and scope of the invention, as expressed in the following claims.

What I claim is:

1. The process of making and assembling interconnected groups of sectional expansion shields which consists in die casting a plurality of complementary, longitudinally divided shield sections in an interconnected group, certain of the longitudinally divided sections having embracing means engageable with other divided sections in a manner to hold the sections in assembled relation, assembling interconnected groups of complementary sections, severing the connecting portions of the assembled sections and causing the holding means on one group of divided sections to embrace and engage the other divided sections.

2. The process of making and assembling interconnected groups of sectional expansion shields which consists in die casting a plurality of complementary, longitudinally divided shield sections in an interconnected group, certain of the longitudinally divided sections having embracing means engageable with other divided sections in a manner to hold the sections in assembled relation, assembling interconnected groups of complementary sections and during the same operation severing the connecting portions of the assembled sections and causing the holding means on one group of divided sections to embrace and engage the other complementary, divided sections.

3. The process of making and assembling interconnected groups of sectional expansion shields which consists in die casting a plurality of complementary, longitudinally divided shield sections in an interconnected group, certain of the longitudinally divided sections having embracing means engageable circumferentially with other divided sections in a manner to hold the sections in assembled relation, guiding and assembling interconnected groups of complementary divided sections, severing the connecting portions of the assembled sections and causing the holding means on one group of sections to embrace and engage the other sections.

4. The method of making expansion shields consisting of casting a group of unit portions of

said shields connected together by casting sprues, assembling therewith complementary longitudinally divided portions of said shields, said first named portions or said complementary portions having bendable lugs thereon adapted to circumferentially embrace the other portions, pressing said lugs into holding relation and by the same pressing motion severing the sprues to form completed shields.

5. The method of making expansion shields comprising casting unit parts of said expansion shields in two identical interfitting groups, each group of said units being integrally connected by sprues, unit members of each group having pairs of bendable lugs thereon adapted to engage members of the other group in holding relation, assembling the two groups in interfitted position, trimming off the surplus sprue metal and bending the lugs of one group into embracing relation with units of the other group.

6. The method of making and assembling sectional expansion shields having complementary sections which consists of die casting a plurality of shield sections in two sprue connected groups, certain sections having means engageable with other sections for securing complementary sections together, asembling the groups of interconnected sections, severing the sprues which connect the sections in groups, causing the securing means on certain sections to engage and embrace the said other sections and during the same operation severing the sprue head of a third interconnected group of sections.

7. The process of making and assembling sectional expansion shields which consists of die casting a plurality of longitudinally divided shield sections in an interconnected group, one-half of the sections of the said group having embracing means engageable with one-half of the sections of another interconnected group when one group is superposed on the other group, superposing one group on another group, and closing said embracing means to connect complementary sections together.

8. The process of making and assembling sectional expansion shields which consists of die casting a plurality of shield sections in an interconnected group, one-half of the sections of each group having embracing means engageable with one-half of the sections of another interconnected group when one group is superposed on the other group, superposing one group on another group, closing said embracing means to connect complementary sections together, and severing the connections between the sections of the groups.

ROY E. McINTOSH.