Oct. 29, 1957 J. H. HARRIS 2,810,969

DEMOLITION DEVICE AND METHOD

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FIG-1

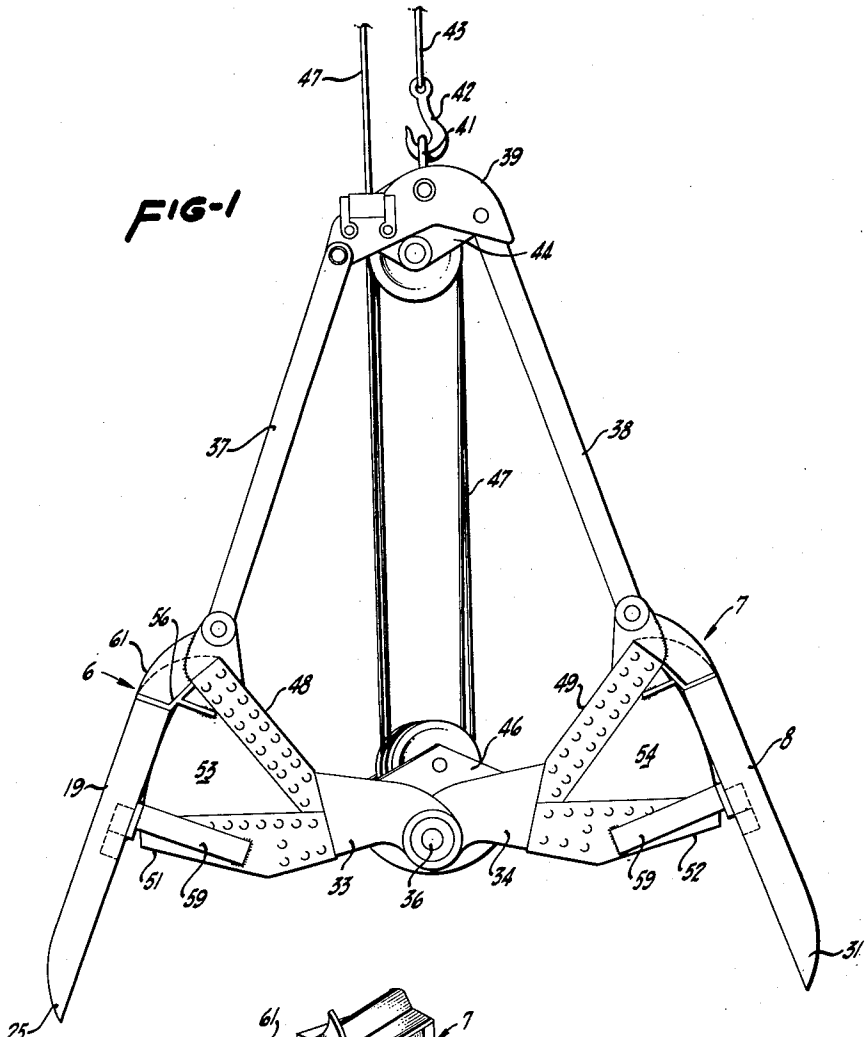
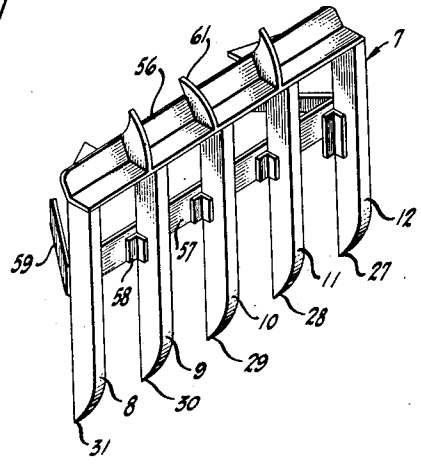


FIG-2



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DEMOLITION DEVICE AND METHOD

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FIG-3

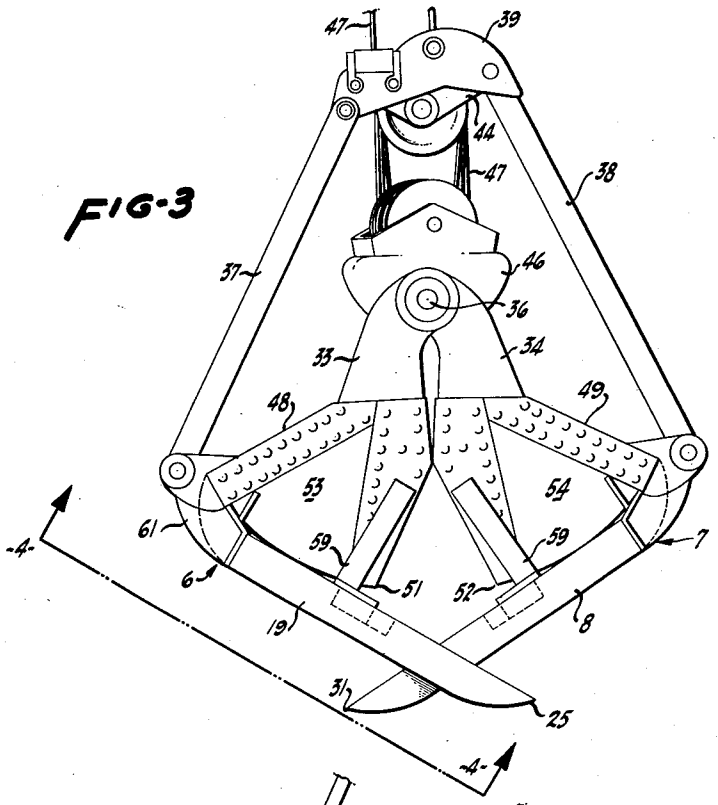
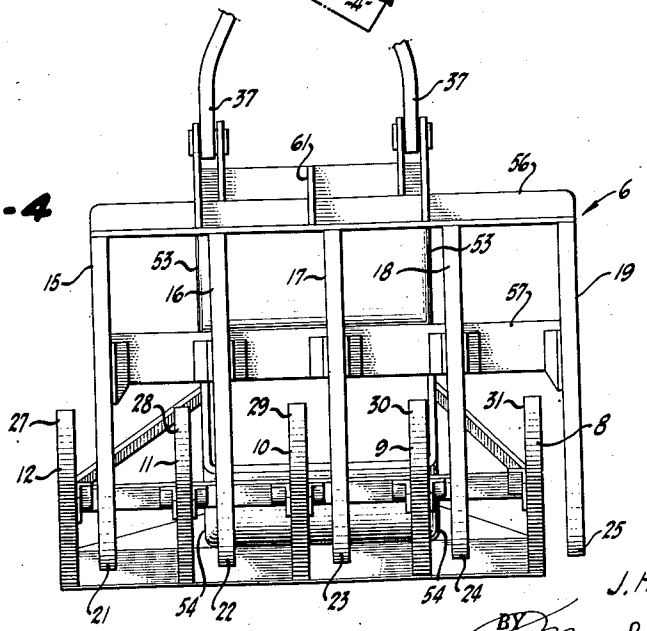


FIG-4



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DEMOLITION DEVICE AND METHOD

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7 Claims. (Cl. 37—184)

The invention relates to the art of wrecking buildings and to the tools and implements and methods used in connection therewith.

The demolition of buildings has been largely carried out in the past with much hand labor so as to salvage as much as possible the building materials. The gradual and constant increase of labor costs has made this method increasingly less profitable and practicable. The hand take-down method is also relatively very time-consuming and is again impracticable where the loss of use of the property will result in loss of profits to the owner or important public or private inconvenience. In all such cases there is a high premium in the completion of the demolition and the clearing of the ground for its new use in the shortest time and at the smallest cost without regard to the salvaging of materials. In accordance with the present invention and as a principal object thereof, the device and method herein presented are specially designed and adapted to accomplish this latter described manner of demolition of old buildings and clearing of the ground for its new intended use.

Another object of the present invention is to provide a demolition device of the character described which is very ruggedly built and is capable of withstanding the heavy punishing use to which it is put.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawings:

Figure 1 is an end elevation of a demolition device constructed in accordance with the present invention.

Figure 2 is a perspective view of one of the racks of ram-like members forming part of the device.

Figure 3 is an end elevation similar to Figure 1 but showing the racks in closed position.

Figure 4 is a side elevation of the device as illustrated in Figure 3 and is taken at the position suggested by the plane of line 4—4 in Figure 3.

The demolition device of the present invention consists, briefly, of a pair of racks 6 and 7, each composed of a plurality of massive elongated ram-like members 8, 9, 10, 11 and 12 in the case of rack 7, and 15, 16, 17, 18 and 19 in the case of rack 6. As will be observed from Figures 2 and 4, the members 8—12 and 15—19 are mounted in spaced side-by-side relation and are provided with pointed lower ends 21, 22, 23, 24 and 25 in the case of rack 6, and 27, 28, 29, 30 and 31 in the case of rack 7, for breaking into and through building structures to be demolished, the members being particularly effective in this regard when dropped in vertical position onto the building structure. The racks 6 and 7 are connected for articulated movement between an open position, as illustrated in Figure 1, with the racks in generally spaced parallel upright position of the ram members and with the pointed ends lowermost, and a closed position of the racks as illustrated in Figures 3 and 4 wherein the lower ends of the ram members are moved into transversely overlapping relation. In this latter closed position and as an important feature of the present device, the members 15—19 on rack 6 are staggered from the members 8—12 of rack 7 so as to provide a meshing of the lower ends of the ram members when in closed position, and a general movement of one set of members between the others with scissor-like action as the racks are swung to closed position. The ram members 15—19 on rack 6 may be spaced centrally between the ram members 8—12 on the other rack 7 or to one side of center as may be most effective for the kind of wrecking encountered and materials handled.

The mounting of the racks 6—7 for articulated movement, as aforesaid, is here effected by horizontally spaced arms 33 which extend from rack 6, and horizontally spaced arms 34 which extend from rack 7 and which are pivotally joined by a shaft 36 so as to provide a pivotal axis medially between the two racks. Articulation of the racks is further obtained by the use of horizontally spaced links 37 which are pivotally connected to and extend upwardly from rack 6, and similar links 38 which are pivotally connected to and extend upwardly from rack 7, the upper ends of the links 37 and 38 being pivotally secured to a head member 39. The latter is here provided with an eye 41 arranged for engagement with a hook 42 at the lower end of a crane hoisting cable 43. Sheave blocks 44 and 46 are carried by the head member 39 and the pivot shaft 36, and are connected by a closing cable 47 which is entrained around the sheaves and extends from the upper end of the device for reeling in or paying out by the operator of the crane to cause a closing and opening of the racks, respectively.

As another feature of the present invention, the demolition device may be incorporated with a modified form of clamshell bucket which is composed of the usual pair of concavo-convex bucket shells 48 and 49 which here serve as a connecting link between the racks 6—7 and the arms 33—34, and are arranged with their concave sides and their normally end and bottom edges opposed and mounted for movement between a swung-apart open position as illustrated in Figure 1, and a swung-together closed position as illustrated in Figure 3. In such case the racks 6—7 are mounted on the outer or convex side of the shells in planes parallel to the axis of the pivot shaft 36 and with the ram members 8—12 and 15—19 projecting from the bottom edges 51 and 52 of the shells for piercing the building structure well in advance of the shell bottoms. The shells 48 and 49 perform a desirable function in providing a scoop or enclosure for small pieces of debris but are so fashioned in the present case so that the bottom edges 51—52 stay wide apart in closed position, as seen in Figure 3, whereby the actual bottom closure for the device is provided by the overlapping and enmeshed ram members 8—12 and 15—19.

As another feature of the present invention, the racks 6 and 7 are provided with a horizontal dimension parallel to the shaft 36 somewhat greater than the corresponding dimension of the shells so that the end members 8 and 12, and 15 and 19, of the two racks, are laterally spaced from and overhang the end surfaces 53 and 54 of the shells 48—49. The suspension of members 15 and 19 and 8 and 12 beyond the ends of the shells provides relatively open spaces at the opposite ends of the device for the catching and entrapment of larger pieces of building material without interference by the shells. Support for the ram members on the exterior sides of the shells and in endwise suspended relation thereto is here effected,

as best seen in Figures 2 and 4, by elongated supporting members 56 and 57 which are mounted on the convex sides of the shells generally parallel to the shaft 36 and extend into overhanging relation to the ends 53 and 54 of the shells. The ram members are laid crosswise to the supporting members 56—57 and may be secured thereto as by welding or the like. Fillet members 58, diagonally bracing members 59, and web members 61, may be included in the racks to provide suitable reinforcing, as illustrated.

In accordance with the preferred method of the present invention, the device is raised by a crane or the like, and by cable 43, over the building structure to be demolished, and cable 47 is operated to open the device to approximately the position of the racks, as illustrated in Figure 1—that is, with the ram-like members in generally vertical relation. The device is then dropped onto the structure to cause the lower pointed ends of the ram members to strike with great force, permitting these members to tear into and through the walls of the structure. The racks are then moved to at least partially closed position to define a claw firmly gripping the section of the building torn into. The crane operator then raises the device so as to pull away a whole section of the structure. This section is then preferably swung over and dropped upon open ground and the ram members dropped upon the section to break it up in a sledge-like action. The racks are then preferably fully opened, as illustrated in Figure 1, even with the ram members, extended beyond vertical position as illustrated, and set down over the mass of pieces of debris caused by the breaking up of the section on the ground. Closing of the sections then causes the lower ends of the ram members to crunch, rake and bunch together these loose pieces. Several passes of the ram members over and through the mass may be made to complete the bunching and compaction of the smaller pieces into the closed scoop provided by the device in closed position. The compact mass may then be elevated from the ground and deposited into waiting haul-away trucks.

While the present device has been illustrated and described primarily as a building demolition unit, it will be understood that it may find other valuable uses in the clearing of brush, handling of logs, and other material. The device also provides a use for clamshell buckets which are worn out in their bottom edges and surfaces and must be discarded. In such case, the bottom sections of the clam buckets are cut away so as to leave an open bottom as hereinabove described.

I claim:

1. A demolition device comprising, a clamshell bucket composed of a pair of concavo-convex bucket shells mounted with their concave sides opposed and pivotally connected about a medial axis for movement between a swung-apart open position and a swung-together closed position, and a pair of racks each composed of an elongated transversely extending header piece and a spaced parallel extending elongated brace member and a plurality of massive elongated ram-like members having upper ends secured to and supported by said header piece and mid portions secured to and braced by said brace member with said ram members supported in spaced parallel relation generally perpendicular to said header piece and brace member and with the lower ends of said ram members projecting in freely spaced relation from said brace member, said racks being mounted on the convex sides of said shells in planes parallel to said axis and with said members projecting from the bottom edges and being pointed for breaking into and through building structures to be demolished, said members being arranged generally upright in said open position and in transversely overlapping relation in said closed position, the members on one rack being staggered from the members on the other rack so as to mesh in said closed position, said bottom edges of said shells being spaced apart in said closed position so that said overlapping and enmeshed members define a bottom closure for said shells in closed position.

2. A demolition device comprising, a clamshell bucket composed of a pair of concavo-convex bucket shells mounted with their concave sides opposed and pivotally connected about a medial axis for movement between a swung-apart open position and a swung-together closed position, and a pair of racks of massive elongated ram-like members arranged in spaced substantially parallel side-by-side relation and connecting transverse supports, said racks being mounted on the convex side of said shells in planes parallel to said axis and with said members projecting from the bottom edges and being pointed for breaking into and through building structures to be demolished, said racks having a dimension parallel to said axis greater than the corresponding dimension of said shells so as to overhang said end edges of said shells, said members being arranged generally upright in said open position and in transversely overlapping relation in said closed position, the members on one rack being staggered from the members on the other rack so as to mesh in said closed position, said bottom edges of said shells being spaced apart in said closed position so that said overlapping and enmeshed members define a bottom closure for said shells in closed position.

3. A demolition device comprising, a pair of concavo-convex bucket shells, arms extending from said shells, a pivot member joining adjacent ends of said arms to position the concave sides of said shells in opposed relation and for movement about the axis of said pivot member between a swung-apart open position and a swung-together closed position, links pivotally connected to the normally upper ends of said shells, a head member pivoted to the upper ends of said links, sheave and cable means connected to said head member and pivot member to effect the raising and lowering of said device and movement of said shells between open and closed positions, elongated supporting members mounted on the convex sides of said shells parallel to said axis and overhanging the ends of said shells, and massive elongated ram-like members mounted on said supporting members in substantially parallel side-by-side relation at spaced intervals over the lengthwise dimension of said shells and in spaced overhanging relation to the ends of said shells and projecting from the bottom edges of said shells for breaking into and through building structures to be demolished, said ram members being arranged generally upright in said open position and in transversely overlapping relation in said closed position, the ram members on one rack being staggered from the ram members on the other rack so as to mesh in said closed position, said bottom edges of said shells being spaced apart in said closed position so that said overlapping and enmeshed ram members define a bottom closure for said shells in closed position.

4. A demolition device comprising, a pair of concavo-convex bucket shells mounted with their concave sides opposed and pivotally connected for movement about a medial axis between a swung apart open position and a swung together closed position, and a pair of racks each composed of an elongated transversely extending header piece and a spaced parallel extending elongated brace member and a plurality of massive elongated ram-like members having upper ends secured to and supported by said header piece and mid portions secured to and braced by said brace member with said ram members supported in spaced parallel relation generally perpendicular to said header piece and brace member and with the lower ends of said ram members projecting in freely spaced relation from said brace member, said racks being mounted on the convex sides of said shells in planes parallel to said axis and with said header pieces secured across said shells generally parallel to said axis and adjacent the normally upper edges of said shells, said brace members being secured across said shells generally parallel to said axis adjacent the normally bottom edges of said shells

with the free ends of said ram members projecting from said edges generally perpendicular thereto, said free ends of said ram members being pointed for breaking into and through building structures to be demolished, said ram members being arranged generally upright in said open position and in transversely overlapping relation in said closed position, said ram members on one rack being staggered from the ram members on the other rack so that said free ends will mesh in said closed position, said shells being formed in closed position with said bottom edges spaced apart so that said free ends of said ram members define a bottom for said shells in closed position.

5. A demolition device comprising, a pair of concavo-convex bucket shells mounted with their concave sides opposed and pivotally connected for movement about a medial axis between a swung apart open position and a swung together closed position, and a pair of racks each composed of an elongated transversely extending header piece and a spaced parallel extending elongated brace member and a plurality of massive elongated ram-like members having upper ends secured to and supported by said header piece and mid portions secured to and braced by said brace member with said ram members supported in spaced parallel relation generally perpendicular to said header piece and brace member and with the lower ends of said ram members projecting in freely spaced relation from said brace member, said racks being mounted on the convex sides of said shells in planes parallel to said axis and with said header pieces secured across said shells and into overhanging relation to the opposite ends thereof generally parallel to said axis and adjacent the normally upper edges of said shells, said brace members being secured across said shells generally parallel to said axis adjacent the normally bottom edges of said shells with the free ends of said ram members projecting from said edges generally perpendicular thereto, said free ends of said ram members being pointed for breaking into and through building structures to be demolished, said ram members being arranged generally upright in said open position and in transversely overlapping relationship in said closed position and the outside ram members of said racks being supported by said header pieces and brace members in spaced relation to the two said opposite ends of said shells and the ram members on one rack being staggered from the ram members on the other rack so that said free ends will mesh in said closed position, said shells being formed in closed position with said bottom edges spaced apart so that said free ends of said ram members define a bottom for said shells in closed position.

6. A demolition device comprising, a pair of concavo-convex bucket shells mounted with their concave sides opposed and pivotally connected for movement about a medial axis between a swung apart open position and a swung together closed position, and a pair of racks each composed of an elongated transversely extending header piece and a spaced parallel extending elongated brace member and a plurality of massive elongated ram-like members having upper ends secured to and supported by said header piece and mid portions secured to and braced by said brace member with said ram members supported in spaced parallel relation generally perpendicular to said header piece and brace member and with the lower ends of said ram members projecting in freely spaced relation from said brace member, said racks being mounted on the convex sides of said shells in planes parallel to said axis and with said header pieces secured across said shells and into overhanging relation to the opposite ends thereof generally parallel to said axis, said brace members being secured across said shells generally parallel to said axis with the free ends of said ram members projecting from the bottom edges of said shells generally perpendicular thereto, said free ends of said ram members being pointed for breaking into and through building structures to be demolished, said ram members being arranged generally upright in said open position and in transversely overlapping relation in said closed position and the outside ram members of said racks being supported by said header pieces and brace members in spaced relation to said opposite ends of said shells and the ram members on one rack being staggered from the ram members on the other rack so that said free ends will mesh in said closed position.

7. A demolition device as characterized in claim 6 wherein said brace members are secured across said shells generally parallel to and adjacent the bottom edges of said shells.

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