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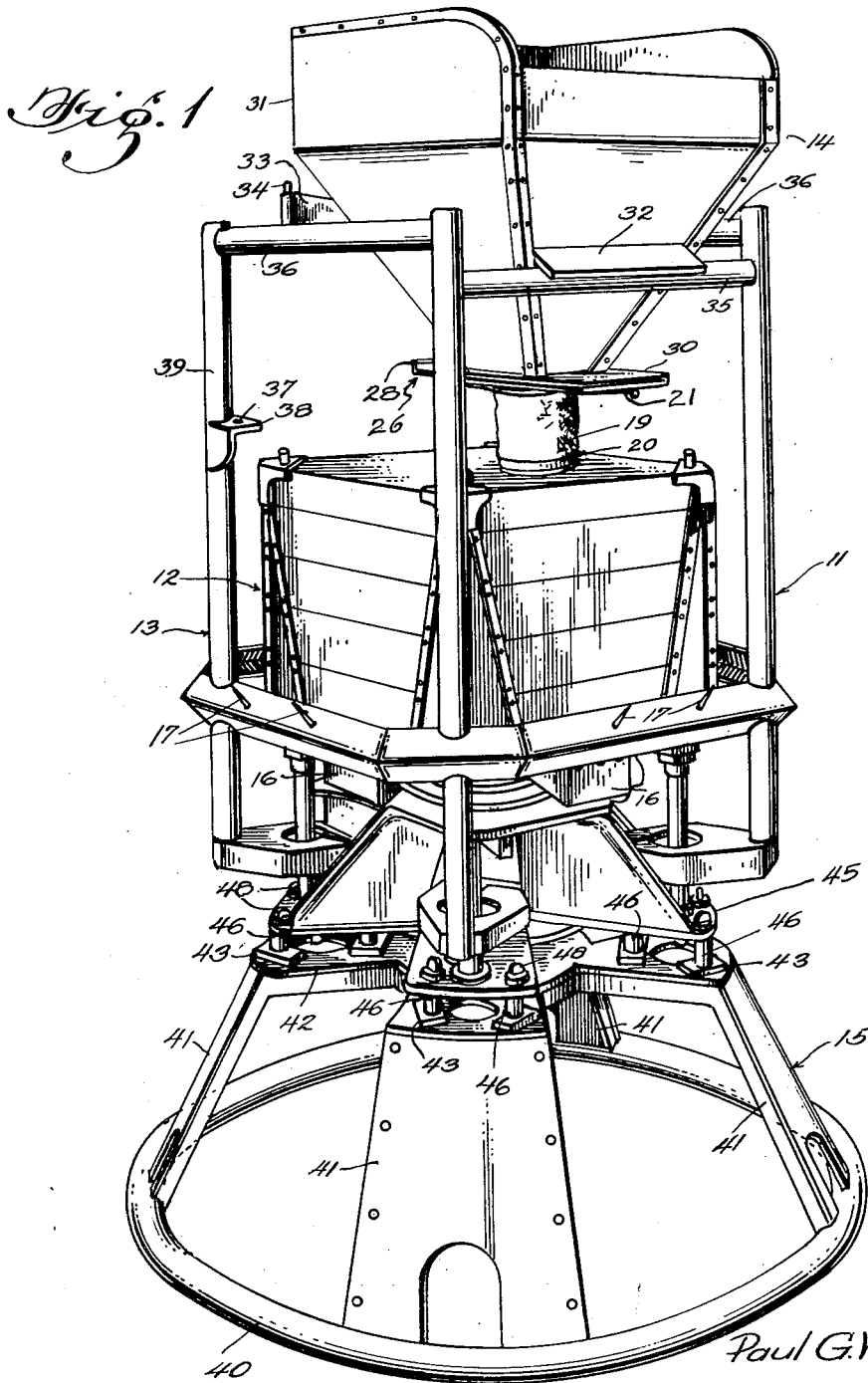
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2,690,841

PORTABLE KNOCKDOWN MACHINE

Filed March 12, 1951

5 Sheets-Sheet 1



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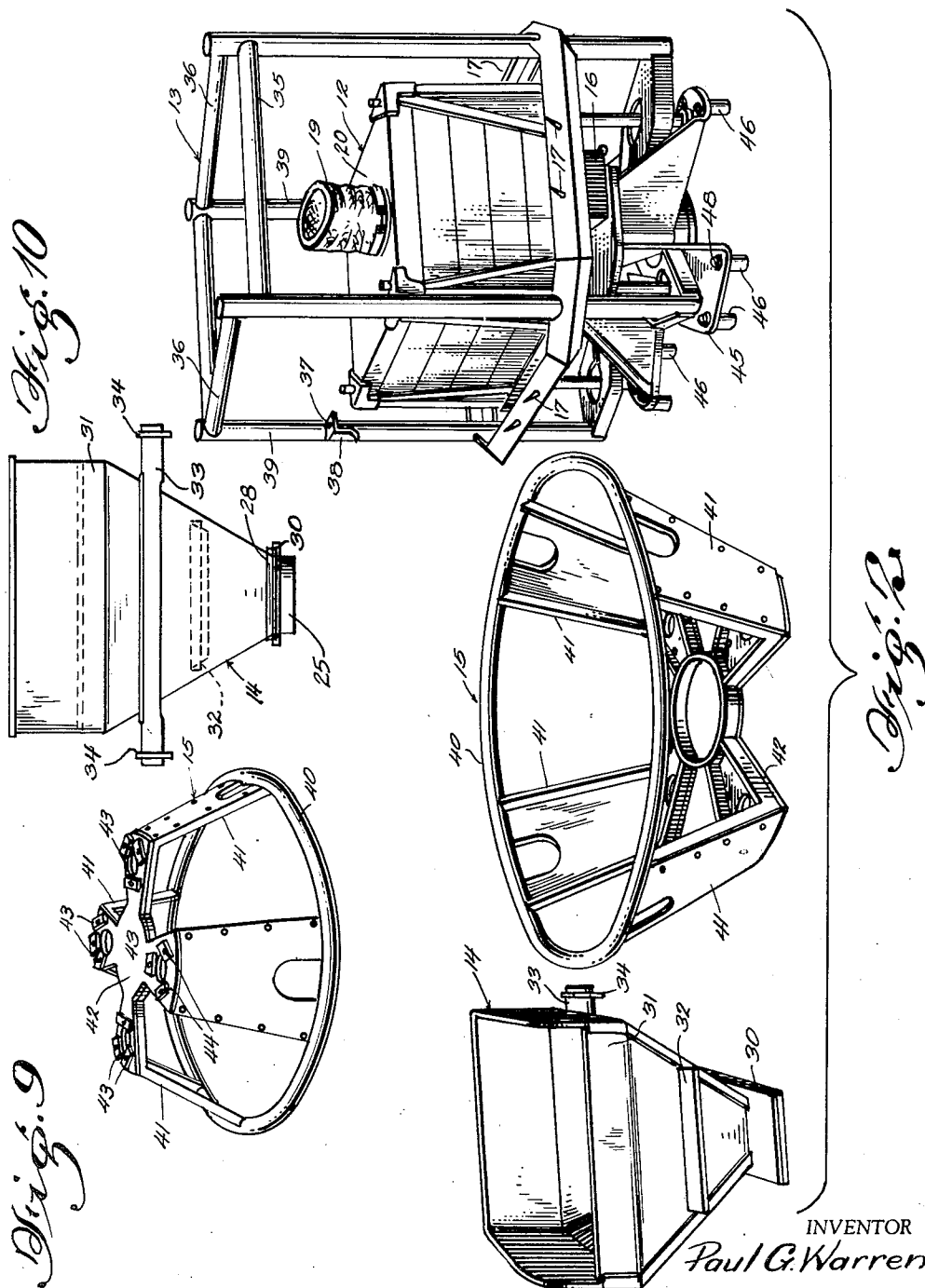
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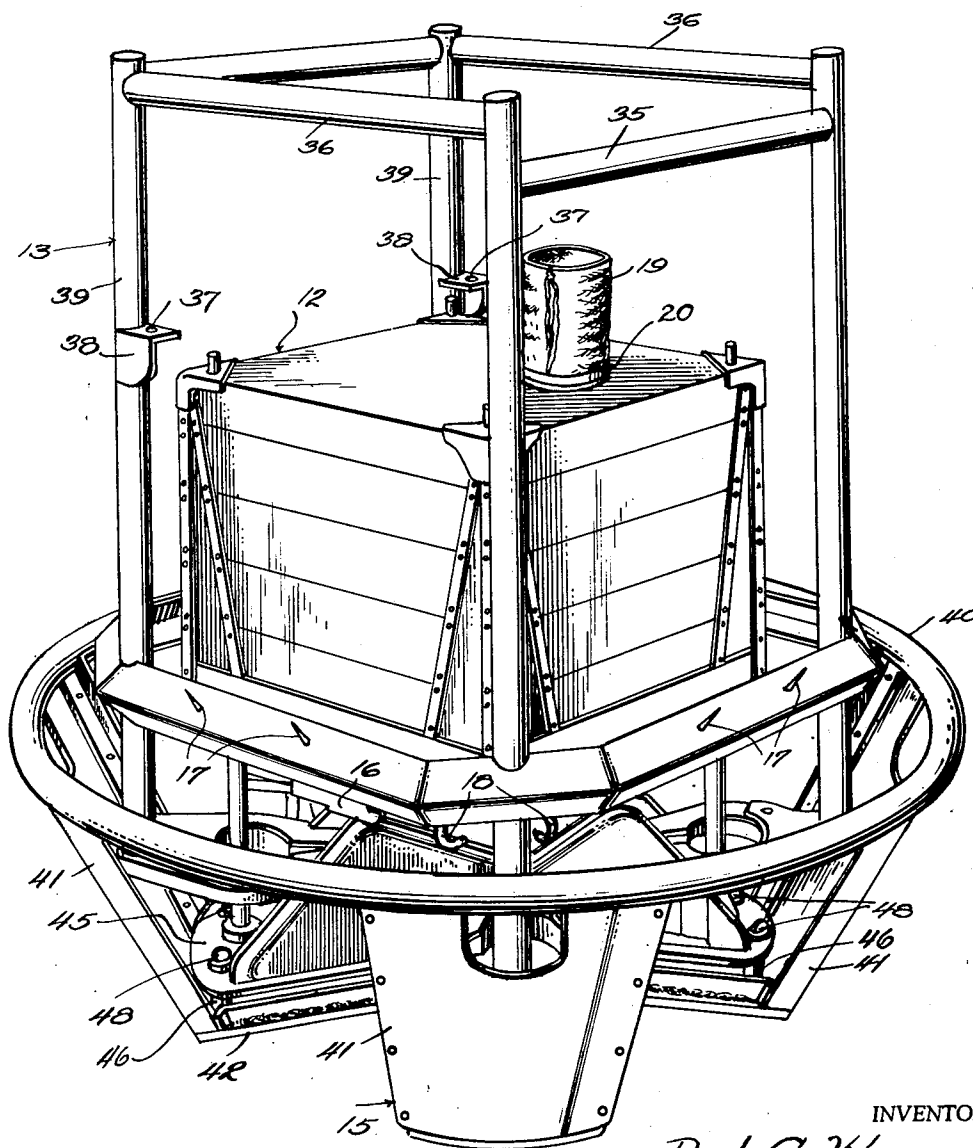
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Fig. 3



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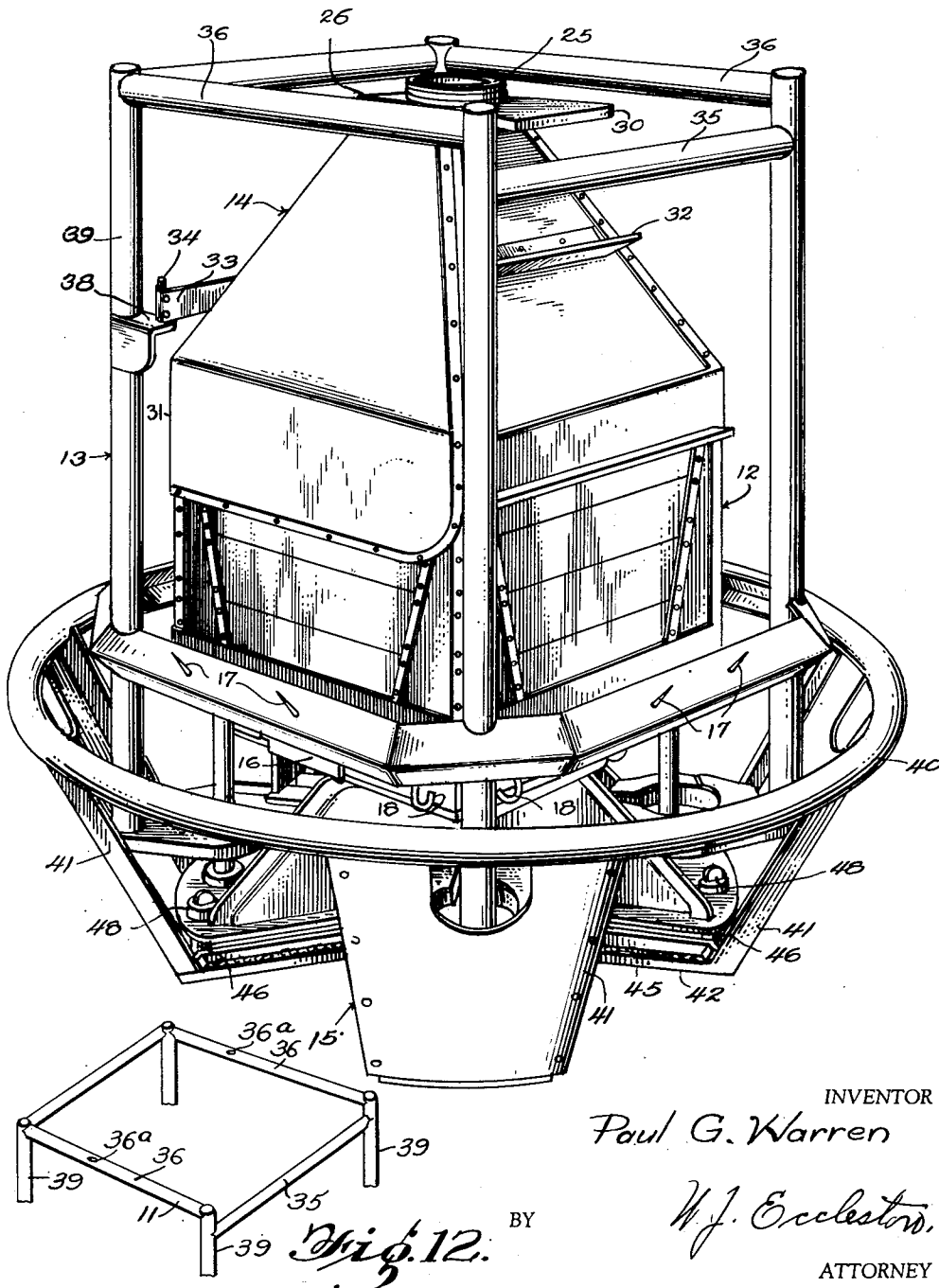
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Fig. 4



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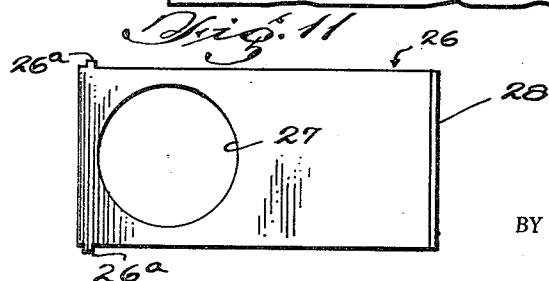
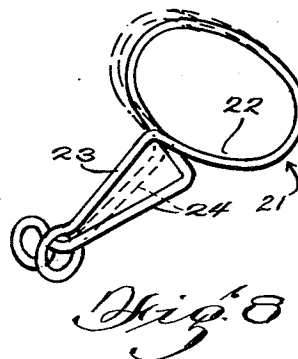
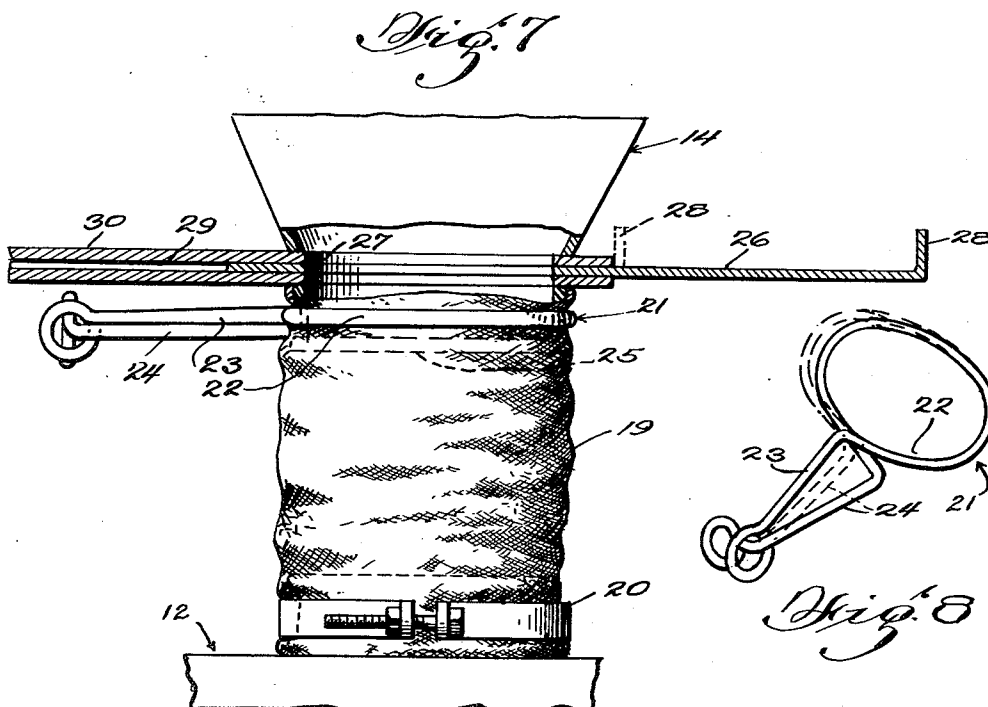
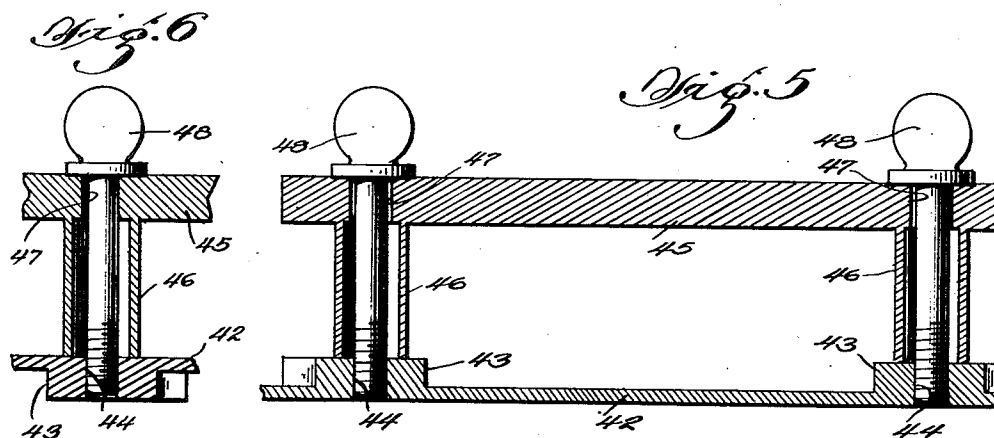
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PORTABLE KNOCKDOWN MACHINE

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5 Claims. (Cl. 209—414)

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My invention relates to portable machines and more particularly to such machines as are adapted to be at least partially knocked down or disassembled for transportation or storage. Such machines are widely used in connection with mobile shops of various kinds. As the vehicles mounting the machinery for such shops are limited as to size, space thereon is always at a premium, whereby it is highly desirable to provide machinery or apparatus which is capable of being knocked down at least partially while travelling so as to occupy less space and thus, to provide additional space for the transport of work pieces or other apparatus which are normally removed from the vehicle when the shop is set up. In addition, it is desirable that the machine be protected against damage while in transport or storage. However, it is equally desirable that the knocked-down machine be so dismantled that it can be reassembled quickly and easily by unskilled personnel using normally available tools. This last restriction eliminates from the scope of the invention certain machines which by their nature are of a compact structure whereby knocking down of the same to reduce the size and subsequent re-assembly would be such a major time-consuming operation for skilled workers as to more than offset any advantage gained from the reduced size achieved.

Nevertheless, certain other machines, particularly those requiring separate bases to elevate them to a suitable work level, and/or those utilizing hoppers to feed material to the machine, may readily lend themselves to being knocked down into a few basic component parts whereby a substantial space saving can be achieved without any substantial loss of time for the knocking down and re-assembly operations. It is with such machines that the invention is primarily concerned. Moreover, while the invention is shown and hereinafter described in connection with a specific machine, it will be understood that the invention is applicable to other machines within the scope of the invention as hereinafter claimed.

With the foregoing in view, it is an object of my invention to provide an improved portable, knock-down machine.

A further object is to provide an improved, portable knockdown machine the separate parts of which are capable of being reassembled and connected together so as to occupy considerably less space than the set up machine.

A further object is to provide in a machine such as that last described, an arrangement of substantially strong parts which will be disposed

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to protect substantially delicate parts when the machine is assembled in the knocked-down condition.

A further object is to provide in a machine such as that last described, means providing carrying handles for the knocked-down assembly, said means being fixed to said substantially strong parts.

A further object is to provide a portable, knock-down machine including a machine proper, a hopper secured to said machine proper for feeding work thereto, and said hopper being detachable and adapted to be inverted and re-applied to said machine to provide a cover therefor.

A further object is to provide a portable knock-down machine, including a machine proper and a hollow, open-bottomed base detachably secured thereto, and said base being adapted to be detached from said machine proper and inverted to provide a receptacle for said machine.

A further object is to provide in a device such as that last described, a hopper detachably secured to said machine proper for feeding work thereto, and said hopper being adapted to be detached from said machine and inverted to provide a cover for said machine.

Other objects and advantages reside in the particular structure of the device, the structure of the several elements forming the same, combinations, subcombinations and arrangements of such elements, all of which will be readily apparent to those skilled in the art upon reference to the attached drawing in connection with the following specification wherein the invention is shown, described and claimed.

In the drawing:

Figure 1 is a perspective view of a machine according to the invention, the same being shown in a setup position ready for operation;

Figure 2 is a composite perspective view on a reduced scale, the parts being shown disassembled with the base inverted;

Figure 3 is a perspective view on a slightly enlarged scale showing the first step in the re-assembly operation;

Figure 4 is a like view showing the device completely re-assembled in the knocked-down arrangement;

Figure 5 is an enlarged, fragmentary, vertical sectional view showing connecting means connecting the machine and base together in the setup position;

Figure 6 is a like view showing the same connecting means connecting the parts together in the knocked-down position;

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Figure 7 is an enlarged fragmentary elevational view partly in vertical section showing the connection between the hopper and machine with the parts in the setup position;

Figure 8 is a perspective view of an element of Figure 7 apart from the rest of the structure;

Figure 9 is a reduced perspective view of the base in the right side up position and apart from the rest of the structure;

Figure 10 a rear view of the hopper on a reduced scale and apart from the rest of the structure;

Figure 11 is a plan view of a valve plate for the hopper apart from the rest of the structure; and

Figure 12, is a fragmentary perspective view, taken from above, of the frame of the machine apart from the rest of the structure.

Referring specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, and referring at first to Figure 1, 11 designates generally a portable knockdown machine which in the embodiment illustrated comprises a flour or like sifter. Thus, the machine 11, may comprise a sifter assembly 12, a frame 13 for mounting the same, a hopper 14 for feeding work to the sifter and a base 15 for supporting the assembly at a convenient height. The sifter assembly 12 per se is of well-known construction and as herein shown comprises a gyratory sifter which is caused to gyrate relative to the frame 13, hopper 14 and base 15 by any suitable power means such as a motor, not shown. The frame 13 is preferably of skeletal construction and is provided with suitable bag or sack supporting means such as the spurs 17 and hooks 18 so that the fines and tailings from the assembly 12 may be sacked in a well-known manner as they are discharged through suitable outlets 16 of the sifter assembly.

Flour or the like is fed into the sifter assembly 12 from the hopper 14 by way of a flexible conduit 19 which is fixed to the assembly in any suitable manner as by the split ring 20 and detachably secured to the spout of the hopper by a spring fastener 21, best seen in Figures 7 and 8. The flexible conduit 19 permits gyratory movement of assembly 12 relative to the hopper 14. The fastener 21 comprises a contractile spring ring portion 22 having crossed arms 23 and 24 which are normally biased apart by the ring portion 22. The ring portion 22 encircles the upper end of the conduit 19 and resiliently binds the same to the discharge spout 25 of the hopper 14. As illustrated in broken lines, Figure 8, the arms 23 and 24 may be squeezed together so as to release the grip of the ring portion 22 from the conduit 19 and spout 25 whereby the hopper 14 may be readily disengaged from the sifter assembly 12 in a manner readily understood.

The lower end of the hopper 14 immediately above the spout 25, is provided with any suitable valve such as the plate valve 26 which is provided with a valve opening 27 and an upturned finger piece 28. The plate 26 is slidable in a slideway 29, Figure 7, of a valve housing 30 which is fixed to the lower end of the hopper 14. Thus, the valve plate 26 may be slid to and fro in the slideway 29 so as to move the valve opening 27 into and out of registry with the spout 25 of the hopper 14. The plate 26 may be provided with any suitable stop means such as the laterally directed lugs 26^a, Figure 11, to limit sliding movement of the plate in both directions, such lugs 26^a cooperating with any suitable fixed stops (not shown) in the slideway 29 to achieve this purpose.

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The upper end 31 of the hopper 14 is formed and provided with a size and shape corresponding to the external size and shape of the sifter assembly 12 whereby when the hopper is detached from the sifter assembly 12 and inverted it may be fitted over the sifter assembly to provide a cover for the latter. Any suitable means may be provided to support the hopper 14 on the frame 13 in both the operative position of Figure 1 and the inoperative or inverted position of Figure 4. Thus, the body of the hopper may be provided with one or more laterally projecting flanges 32 for seating upon a cross frame member 35 of the frame 13. Likewise, an opposite side of the hopper 14 may be provided with a cross piece 33 the opposite ends of which project beyond opposite sides of the hopper and which are provided with vertical pins 34 for seating in suitable sockets 36a, Figure 12, in other frame cross pieces 36, Figure 1. When the hopper 14 is in the inverted position of Figure 4 it is, of course, supported by the sifter assembly 12 but the latter is steadied against gyratory or other lateral movement in a suitable manner, as by seating the opposite ends of the pins 34 in sockets 37 formed in brackets 38 fixed to vertical frame members 39 of the frame 13, Figure 4. It is apparent, that with the hopper 14 in the inverted position and the valve plate 26 in the closed position, a substantially dust-tight cover is provided for the sifter assembly 12 and movement of the latter relative to the frame 13 is prevented.

The base 15 is necessarily hollow and in the embodiment illustrated comprises a skeletal structure provided by a base ring 40 to which are fixed a plurality of upwardly and inwardly converging struts 41. Struts 41 are connected together at their upper ends by a substantially horizontal platform 42 providing a seat for the sifter assembly 12. The platform 42 is formed with suitable means for readily detachably connecting the sifter assembly 12 thereto in both the operative and travelling positions. As illustrated, such means comprises a plurality of threaded holes 44 extending vertically through the platform 42 and through strengthening bosses or fixed nuts 43 carried by the platform as best seen in Figures 5 and 6. The skeletal form of base illustrated is desirable to reduce weight and add to the ease of handling. Also, it facilitates the re-assembly of the parts in the inoperative position as will be apparent hereafter.

The frame 13 for the sifter assembly 12 has a fixed footing or base 45 fixed thereto and from which may depend a number of hollow feet 46 which correspond in number and position to the holes 44 of the platform 42 whereby to register with the same. Thumbscrews 48 pass through holes 47 in the footing 45, through the hollow feet 46 and threadedly seat in the holes 44 of the platform 42 whereby the frame 13 is rigidly but detachably connected to the base 15 in the operative position, Figures 1 and 5. Also, as best seen in Figures 4 and 6, when the screws 48 are removed, the frame 13 and sifter assembly 12 lifted off of the base 15, the latter may be inverted and the frame and sifter assembly can be seated within the base 15 with the feet 46 again in registry with the threaded holes 44. The thumbscrews 48 may now be re-seated in holes 44 and tightened whereby to secure frame 13, sifter assembly 12 and base 15 together in the knocked-down or travelling position.

When the machine is in the knocked-down or

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travelling position, Figure 4, the base ring 40 provides convenient hand holds or grips whereby two or more persons may easily lift and transport the machine. At the same time, the machine occupies considerably less space than when in the operative position of Figure 1. Also, the sifter assembly is entirely surrounded by the frame 13, base 15 and hopper 14, as well as being firmly connected thereto whereby it is protected against damage due to jolts and other shocks incident to normal transport. As aforesaid, the open top of the sifter assembly is protected from dust and dirt by the hopper 14.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it should be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structures shown and described hereinabove except as hereinafter claimed.

I claim:

1. A portable gyratory sifter, comprising a sifter assembly, a rigid frame surrounding said assembly, means mounting said assembly in said frame for gyratory movement relative thereto, a hopper for said assembly, cooperating means on said frame and on said hopper for mounting the latter in operative relation to said assembly, said hopper being sized and shaped to provide a cover for said assembly upon being detached therefrom and inverted, secondary cooperating means on said frame engaging said cooperating means of said hopper and providing a readily releasable rigid connection between said frame and inverted hopper when the latter is functioning as a cover, and said inverted hopper and said connection comprising means preventing gyratory movement of said assembly while said hopper is functioning as a cover.

2. A portable machine, comprising a rigid frame, a machine supported by said frame for operating movement relative thereto, a hollow open-topped hopper for said machine, means for mounting said hopper on said frame in an operative position, a readily detachable flexible conduit connecting said hopper to said machine to permit operating movement of said machine relative to said hopper and frame, said hopper being sized and shaped to provide a cover for said machine when detached therefrom and re-applied thereto in an inverted position, means pro-

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viding a readily releasable connection between said frame and hopper with the latter in said inverted cover-providing position, and said hopper and connection comprising means preventing operating movement of said machine relative to said frame and inverted hopper.

3. A portable machine, comprising a frame, a machine supported by said frame for operating movement relative thereto, a hollow open-topped hopper for said machine, means mounting said hopper in an operative position for feeding material to said machine, said hopper being sized and shaped to provide a cover for said machine when detached therefrom and re-applied thereto in an inverted position, and readily releasable connecting means securing said inverted hopper, machine and frame together and comprising means preventing movement of said machine relative to said frame and hopper.

4. The structure of claim 3, wherein said last named means comprises rigid extensions of said hopper, and means on said frame detachably engaging said extensions.

5. The structure of claim 3, wherein said last named means comprises a cross piece fixed to said hopper and having opposite ends projecting laterally of said hopper in opposite directions, downwardly extending pins fixed to said ends of said cross piece, and said frame being formed with upwardly directed sockets slidably receiving said pins therein.

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