CLAIMS:

1. A jarring apparatus, comprising:

first and second jarring assemblies axially moveable relative to each other between first and second axial configurations;

a thrust assembly interposed between the first and second jarring assemblies to limit relative axial movement therebetween at the second axial configuration and permit axial loading in one axial direction to be transferred between the first and second jarring assemblies via the thrust assembly; and

a jarring mass axially moveable within the jarring apparatus in reverse first and second directions ~~in response to relative rotation between the first and second jarring assemblies.~~;

a force mechanism for biasing the jarring mass in its first axial direction and for biasing the first and second jarring assemblies in a direction towards their first axial configuration; and

a lifting assembly operable by relative rotation between the first and second jarring assemblies to cyclically lift the jarring mass in the second axial direction against the bias of the force mechanism and release the lifted jarring mass to permit the jarring mass to be driven by the force mechanism in the first direction.

~~2. The jarring apparatus according to claim 1, further comprising:~~

~~a force mechanism for biasing the jarring mass in its first axial direction and for biasing the first and second jarring assemblies in a direction towards their first axial configuration; and~~

~~a lifting assembly operable by relative rotation between the first and second jarring assemblies to cyclically lift the jarring mass in the second axial direction against the bias of the force mechanism and release the lifted jarring mass to permit the jarring mass to be driven by the force mechanism in the first direction.~~

~~3~~2. The jarring apparatus according to claim ~~2~~1, wherein the force mechanism is of a displacement type such that the force generated within the force mechanism is a function of the relative axial movement of the first and second jarring assemblies towards their second configuration.

~~4~~3. The jarring apparatus according to claim ~~2~~1 or ~~3~~2, wherein initial relative axial movement of the first and second jarring assemblies from their first configuration towards their second configuration is permitted without corresponding operation of the force mechanism.

~~5~~4. The jarring apparatus according to any preceding claim~~one of claims 2 to 4~~, wherein the force mechanism is interposed between one of the first and second jarring assemblies and the jarring mass, and is operated on opposing sides thereof by one of the first and second jarring assembles and the jarring mass.

~~6~~5. The jarring apparatus according to any preceding claim~~one of claims 2 to 5~~, further comprising a bearing structure which is interposed between the force mechanism and the jarring mass.

~~7~~6. The jarring apparatus according to any preceding claim~~one of claims 2 to 6~~, comprising an arresting mechanism configured to arrest movement of the reciprocating mass when moving in the first axial direction under the action of the force mechanism~~.~~,

optionally wherein the arresting mechanism comprises a first impact surface provided on the jarring mass, and a second impact surface provided on at least one of the first and second jarring assemblies, wherein the first and second impact surfaces are configured to be impacted together when the jarring mass is driven in its first direction under the action of the force mechanism,

optionally wherein the first and second impact surfaces are provided separately from the lifting assembly.

~~8. The jarring apparatus according to claim 7, wherein the arresting mechanism comprises a first impact surface provided on the jarring mass, and a second impact surface provided on at least one of the first and second jarring assemblies, wherein the first and second impact surfaces are configured to be impacted together when the jarring mass is driven in its first direction under the action of the force mechanism.~~

~~9. The jarring apparatus according to claim 8, wherein the first and second impact surfaces are provided separately from the lifting assembly.~~

~~10~~7. The jarring apparatus according to claim 6~~any one of claims 7 to 9~~, wherein the arresting mechanism comprises a damping mechanism.

~~11~~8. The jarring apparatus according to any preceding claim, wherein the thrust assembly comprises respective loading faces on the first and second jarring assemblies, wherein the respective loading faces are axially engaged when the first and second jarring assemblies reach their second axial configuration~~.~~,

and/or wherein the thrust assembly permits the first and second jarring assemblies to be rotatable relative to each other when in their second configuration.

~~12. The jarring apparatus according to any preceding claim, wherein the thrust assembly permits the first and second jarring assemblies to be rotatable relative to each other when in their second configuration.~~

~~13~~9. The jarring apparatus according to any preceding claim~~one of claims 2 to 12~~, wherein the lifting assembly comprises:

a first lifting structure rotatably and axially fixed relative to one of the first and second jarring assemblies and a second lifting structure rotatably fixed and axially moveable relative to the other of the first and second jarring assemblies, wherein the second lifting structure acts axially on the jarring mass,

wherein the first and second lifting structures are configured to cooperate during relative rotation therebetween to cause the second lifting structure to be axially moved in cyclical lifting and dropping phases, wherein during the lifting phase the second lifting structure causes the jarring mass to be lifted in its second direction.

~~14~~10. The jarring apparatus according to claim ~~13~~9, wherein the second lifting structure is separately formed from the jarring mass, and the apparatus further comprises a bearing structure which is interposed between the second lifting structure and the jarring mass~~.~~,

and/or wherein the first lifting structure is releasably axially connected to its associated jarring assembly such that axial release of the first lifting structure permits axial release of the jarring mass to be driven in its first direction by the force mechanism,

optionally wherein the first lifting structure is axially releasable from its associated jarring assembly prior to initiation of the dropping phase.

~~15. The jarring apparatus according to claim 13 or 14, wherein the first lifting structure is releasably axially connected to its associated jarring assembly such that axial release~~

~~of the first lifting structure permits axial release of the jarring mass to be driven in its first direction by the force mechanism.~~

~~16. The jarring apparatus according to claim 15, wherein the first lifting structure is axially releasable from its associated jarring assembly prior to initiation of the dropping phase.~~

~~17~~11. The jarring apparatus according to claim ~~15 or 16~~10, wherein the first lifting structure is axially releasable from its associated jarring assembly prior to completion of the lifting phase.

~~18~~12. The jarring apparatus according to any one of claims ~~13 to 17~~9 to 11, wherein the first and second lifting structures comprise inter-engaging profiles which cooperate during relative rotation of the lifting structures to cause the cyclical lifting and dropping phases~~.~~,

and/or wherein the jarring apparatus further comprises a locking system for selectively axially fixing and releasing the first lifting structure relative to its associated jarring assembly,

optionally wherein the locking system is operated by relative rotational movement between the first and second jarring assemblies,

optionally wherein the locking system comprises a hydraulic locking system for hydraulically locking and releasing the first lifting structure relative to its associated jarring assembly,

optionally wherein the hydraulic locking system is configured to hydraulically lock a volume of hydraulic fluid axially against the first lifting structure to provide locking, and to release the hydraulic fluid to provide unlocking.

~~19. The jarring apparatus according to any one of claims 13 to 18, further comprising a locking system for selectively axially fixing and releasing the first lifting structure relative to its associated jarring assembly.~~

~~20. The jarring apparatus according to claim 19, wherein the locking system is operated by relative rotational movement between the first and second jarring assemblies.~~

~~21. The jarring apparatus according to claim 19 or 20, wherein the locking system comprises a hydraulic locking system for hydraulically locking and releasing the first lifting structure relative to its associated jarring assembly.~~

~~22. The jarring apparatus according to claim 21, wherein the hydraulic locking system is configured to hydraulically lock a volume of hydraulic fluid axially against the first lifting structure to provide locking, and to release the hydraulic fluid to provide unlocking.~~

~~23~~13. The jarring apparatus according to claim ~~21 or 22~~12, wherein the hydraulic locking system comprises a first hydraulic chamber, wherein hydraulic fluid is hydraulically locked within said first hydraulic chamber to hydraulically lock the first lifting structure relative to its associated jarring assembly~~.~~,

optionally wherein the hydraulic locking system comprises a valve assembly which is closed to hydraulically lock the fluid within the first hydraulic chamber, and which is opened to release the hydraulically locked fluid,

optionally wherein the valve assembly is configurable between open and closed configurations in response to relative rotation between the first and second jarring assemblies.

~~24. The jarring apparatus according to claim 23, wherein the hydraulic locking system comprises a valve assembly which is closed to hydraulically lock the fluid within the first hydraulic chamber, and which is opened to release the hydraulically locked fluid.~~

~~25. The jarring apparatus according to claim 24, wherein the valve assembly is configurable between open and closed configurations in response to relative rotation between the first and second jarring assemblies.~~

~~26~~14. The jarring apparatus according to any preceding claim, comprising a releasable rotary connection which is configurable between a connected configuration in which the first and second jarring assemblies are rotatably fixed relative to each other, and a released configuration in which the first and second jarring assemblies are rotatable relative to each other~~.~~,

and/or comprising a releasable axial locking mechanism arranged between the first and second jarring assemblies.

~~27. The jarring apparatus according to any preceding claim, comprising a releasable axial locking mechanism arranged between the first and second jarring assemblies.~~

~~28~~15. A method for providing jarring, comprising:

establishing relative axial movement between first and second jarring assemblies of a jarring apparatus from a first axial configuration towards a second axial configuration to energise a force mechanism which functions to bias a jarring mass in a first axial direction;

limiting relative axial movement between the first and second jarring assemblies at the second axial configuration by a thrust assembly; and

establishing relative rotational movement between the first and second jarring assemblies to ~~move a jarring mass in reverse first and second directions~~operate a lifting assembly within the jarring apparatus which cyclically lifts the jarring mass in a second axial direction against the bias of the force mechanism and releases the lifted jarring mass to permit the jarring mass to be driven by the force mechanism in a reverse first direction to generate a jarring force within the apparatus.

~~29. The method according to claim 28, wherein the step of establishing relative axial movement between the first and second jarring assemblies from their first axial configuration towards their second axial configuration energises a force mechanism which functions to bias a jarring mass in a first axial direction.~~

~~30. The method according to claim 29, wherein establishing relative rotational movement between the first and second jarring assemblies operates a lifting assembly within the jarring apparatus which cyclically lifts the jarring mass in the second axial direction against the bias of the force mechanism and releases the lifted jarring mass to permit the jarring mass to be driven by the force mechanism in the first direction to generate a jarring force within the apparatus.~~