CLAIMS

1. A method for publishing and converting blockchain assets, the method comprising:

determining, by a blockchain anchor, that a first off-chain asset of a specified amount is in a frozen state indicating that the first off-chain asset is isolated and protected from a plurality of factors ;

publishing, by the blockchain anchor, a first blockchain asset on a blockchain, wherein an amount of the first blockchain asset is not greater than the specified amount;

publishing, by the blockchain anchor, a transaction record of the first blockchain asset in a blockchain ledger containing a first freeze certificate for the first off-chain asset;

receiving, by a blockchain anchor, a conversion request for a second blockchain asset initiated by a blockchain member;

determining, by the blockchain anchor, whether there is a second freeze certificate that corresponds to the second blockchain asset based on ledger data in the blockchain ledger; and

converting, by the blockchain anchor, the second blockchain asset to a second off-chain asset of a corresponding amount when there is the second freeze certificate that corresponds to the second blockchain asset, to provide the second off-chain asset to the blockchain member.

2. The method according to claim 1, wherein a type of the first off-chain asset is funds or securities, the first off-chain asset is in a predetermined account, and the predetermined account is in the frozen state.

3. The method according to claim 2, wherein the predetermined account is a frozen asset-specific account specified by the blockchain anchor.

4. The method according to claim 1, wherein a type of the first off-chain asset is a real asset, the first off-chain asset is at a predetermined storage location, and it is determined that the first off-chain asset is in the frozen state when an information collection device collects information about the first off-chain asset at the predetermined storage location.

5. The method according to claim 1, further comprising:

generating, by the blockchain anchor, the first freeze certificate after freezing the first off-chain asset.

6. The method according to claim 1, further comprising:

receiving, by the blockchain anchor, the first freeze certificate from a trustworthy third party, wherein the trustworthy third party freezes the first off-chain asset.

7. The method according to claim 1, wherein the first blockchain asset is of the same type as a corresponding off-chain asset.

8. The method according to claim 1, wherein the second freeze certificate comprises a signature of a trustworthy third party or an anchor that publishes the second blockchain asset.

9. The method according to claim 1, wherein converting, by the blockchain anchor, the second blockchain asset to the second off-chain asset of the corresponding amount comprises:

unfreezing, by the blockchain anchor, a frozen asset that corresponds to the second freeze certificate to use the frozen asset as the second off-chain asset and transfer the second off-chain asset to an asset storage location specified by the blockchain member.

10. The method according to claim 1, wherein converting, by the blockchain anchor, the second blockchain asset to the second off-chain asset of the corresponding amount comprises:

using, by the blockchain anchor, another asset as the second off-chain asset, wherein the another asset is different from a frozen asset that corresponds to the second freeze certificate.

11. The method according to claim 1, further comprising:

verifying, by the blockchain anchor, a publishing party of the second blockchain asset and a holder of the second blockchain asset; and

converting, by the blockchain anchor, the second blockchain asset that has the second freeze certificate to the second off-chain asset when the publishing party of the second blockchain asset

is the blockchain anchor, and the blockchain member is the holder of the second blockchain asset.

12. The method according to claim 1, further comprising:

transferring, by the blockchain anchor, the second blockchain asset to a write-off specific account after converting the second blockchain asset, wherein there is transfer-in permission and no transfer-out permission to access the write-off specific account.

13. The method according to claim 1, wherein the second off-chain asset comprises a radio frequency identifier tag.

14. An apparatus for publishing blockchain assets, the apparatus comprising a plurality of modules configured to perform the method of any one of claims 1 to 13.

15. A computer-implemented method for supporting a blockchain asset issued on a blockchain, the computer-implemented method comprising:

determining, by a blockchain anchor, that an off-chain asset of a particular amount is in a frozen state, wherein the frozen state ensures the off-chain asset is protected from a change in the particular amount; and

issuing, by the blockchain anchor, the blockchain asset on the blockchain, wherein a value of the blockchain asset is within the particular amount;

obtaining, by the blockchain anchor, a freeze certificate comprising a digital signature, wherein the freeze certificated identifies the blockchain asset as supported by an off-chain asset in a frozen state;

publishing, by the blockchain anchor, a transaction record of the blockchain asset in a blockchain ledger of the blockchain, the transaction record comprising the freeze certificate for the blockchain asset;

receiving, by a blockchain anchor, a redemption request for the blockchain asset, the redemption request initiated by a blockchain member on the blockchain;

determining, by the blockchain anchor, that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger; and

in response to determining that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger, redeeming, by the blockchain anchor, the blockchain asset by converting the blockchain asset to an off-chain asset of a value associated with the particular amount.

16. The computer-implemented method of claim 15, wherein converting, by the blockchain anchor, the blockchain asset to the off-chain asset of a value associated with the particular amount comprises:

unfreezing, by the blockchain anchor, the off-chain asset that corresponds to the freeze certificate and that is in the frozen state, wherein the off-chain asset comprises a fund or a security in a predetermined account specified by the blockchain anchor.

17. The computer-implemented method of claim 15, further comprising:

verifying, by the blockchain anchor, an issuing party of the blockchain asset and a holder of the blockchain asset; and

redeeming, by the blockchain anchor, the blockchain asset that has a corresponding freeze certificate, wherein the issuing party of the blockchain asset is the blockchain anchor, and wherein the blockchain member is the holder of the blockchain asset.

18. The computer-implemented method of claim 17, wherein obtaining the freeze certificate further comprises: (i) generating, by the blockchain anchor, the freeze certificate after freezing the off-chain asset, wherein the freeze certificate comprises a digital signature of the blockchain anchor that issues the blockchain asset; or

(ii) receiving, by the blockchain anchor, the freeze certificate from a trustworthy third party, wherein the freeze certificate comprises a digital signature of a trustworthy third party and a digital signature of the blockchain anchor that issues the blockchain asset.

19. The computer-implemented method of claim 15, further comprising:

in response to redeeming the blockchain asset, transferring, by the blockchain anchor, the blockchain asset to a write-off specific account, wherein the write-off specific account comprises a transfer-in permission and no transfer-out permission to access the write-off specific account, and wherein the blockchain asset is of the same type as the off-chain asset.

20. The computer-implemented method of claim 15, wherein a type of the off-chain asset is a real asset, wherein the off-chain asset is at a predetermined storage location, wherein an information collection device collects information about the off-chain asset at the predetermined storage location, and wherein the information collection device comprises a radio frequency identifier tag reader, and wherein the off-chain asset comprises a radio frequency identifier tag.

21. A non-transitory, computer-readable medium storing one or more instructions executable by a computer system to perform operations comprising:

determining, by a blockchain anchor, that an off-chain asset of a particular amount is in a frozen state, wherein the frozen state ensures the off-chain asset is protected from a change in the particular amount; and

issuing, by the blockchain anchor, a blockchain asset on a blockchain, wherein a value of the blockchain asset is within the particular amount;

obtaining, by the blockchain anchor, a freeze certificate comprising a digital signature, wherein the freeze certificated identifies the blockchain asset as supported by an off-chain asset in a frozen state;

publishing, by the blockchain anchor, a transaction record of the blockchain asset in a blockchain ledger of the blockchain, the transaction record comprising the freeze certificate for the blockchain asset;

receiving, by a blockchain anchor, a redemption request for the blockchain asset, the redemption request initiated by a blockchain member on the blockchain;

determining, by the blockchain anchor, that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger; and

in response to determining that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger, redeeming, by the blockchain anchor, the blockchain asset

by converting the blockchain asset to an off-chain asset of a value associated with the particular amount.

22. The non-transitory, computer-readable medium of claim 21, wherein converting, by the blockchain anchor, the blockchain asset to the off-chain asset of a value associated with the particular amount comprises:

unfreezing, by the blockchain anchor, the off-chain asset that corresponds to the freeze certificate and that is in the frozen state, wherein the off-chain asset comprises a fund or a security in a predetermined account specified by the blockchain anchor.

23. The non-transitory, computer-readable medium of claim 21, wherein the operations further comprise:

verifying, by the blockchain anchor, an issuing party of the blockchain asset and a holder of the blockchain asset; and

redeeming, by the blockchain anchor, the blockchain asset that has a corresponding freeze certificate, wherein the issuing party of the blockchain asset is the blockchain anchor, and wherein the blockchain member is the holder of the blockchain asset.

24. The non-transitory, computer-readable medium of claim 23, wherein obtaining the freeze certificate further comprises:

(i) generating, by the blockchain anchor, the freeze certificate after freezing the off-chain asset, wherein the freeze certificate comprises a digital signature of the blockchain anchor that issues the blockchain asset; or

(ii) receiving, by the blockchain anchor, the freeze certificate from a trustworthy third party, wherein the freeze certificate comprises a digital signature of a trustworthy third party and a digital signature of the blockchain anchor that issues the blockchain asset.

25. The non-transitory, computer-readable medium of claim 21, wherein the operations further comprise:

in response to redeeming the blockchain asset, transferring, by the blockchain anchor, the blockchain asset to a write-off specific account, wherein the write-off specific account comprises a transfer-in permission and no transfer-out permission to access the write-off specific account, and wherein the blockchain asset is of the same type as the off-chain asset.

26. The non-transitory, computer-readable medium of claim 21, wherein a type of the off-chain asset is a real asset, wherein the off-chain asset is at a predetermined storage location, wherein an information collection device collects information about the off-chain asset at the predetermined storage location,, and wherein the information collection device comprises a radio frequency identifier tag reader, and wherein the off-chain asset comprises a radio frequency identifier tag.

27. A computer-implemented system, comprising:

one or more computers; and

one or more computer memory devices interoperably coupled with the one or more computers and having tangible, non-transitory, machine-readable media storing one or more instructions that, when executed by the one or more computers, perform one or more operations comprising:

determining, by a blockchain anchor, that an off-chain asset of a particular amount is in a frozen state, wherein the frozen state ensures the off-chain asset is protected from a change in the particular amount; and

issuing, by the blockchain anchor, a blockchain asset on a blockchain, wherein a value of the blockchain asset is within the particular amount;

obtaining, by the blockchain anchor, a freeze certificate comprising a digital signature, wherein the freeze certificated identifies the blockchain asset as supported by an off-chain asset in a frozen state;

publishing, by the blockchain anchor, a transaction record of the blockchain asset in a blockchain ledger of the blockchain, the transaction record comprising the freeze certificate for the blockchain asset;

receiving, by a blockchain anchor, a redemption request for the blockchain asset, the redemption request initiated by a blockchain member on the blockchain;

determining, by the blockchain anchor, that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger; and

in response to determining that the freeze certificate that corresponds to the blockchain asset exists in the blockchain ledger, redeeming, by the blockchain anchor, the blockchain asset by converting the blockchain asset to an off-chain asset of a value associated with the particular amount.

28. The computer-implemented system of claim 27, wherein converting, by the blockchain anchor, the blockchain asset to the off-chain asset of a value associated with the particular amount comprises:

unfreezing, by the blockchain anchor, the off-chain asset that corresponds to the freeze certificate and that is in the frozen state, wherein the off-chain asset comprises a fund or a security in a predetermined account specified by the blockchain anchor.

29. The computer-implemented system of claim 27, wherein the operations further comprise:

verifying, by the blockchain anchor, an issuing party of the blockchain asset and a holder of the blockchain asset; and

redeeming, by the blockchain anchor, the blockchain asset that has a corresponding freeze certificate, wherein the issuing party of the blockchain asset is the blockchain anchor, and wherein the blockchain member is the holder of the blockchain asset.

30. The computer-implemented system of claim 29, wherein obtaining the freeze certificate further comprises:

(i) generating, by the blockchain anchor, the freeze certificate after freezing the off-chain asset, wherein the freeze certificate comprises a digital signature of the blockchain anchor that issues the blockchain asset; or

(ii) receiving, by the blockchain anchor, the freeze certificate from a trustworthy third party, wherein the freeze certificate comprises a digital signature of a trustworthy third party and a digital signature of the blockchain anchor that issues the blockchain asset.

31. The computer-implemented system of claim 27, wherein the operations further comprise:

in response to redeeming the blockchain asset, transferring, by the blockchain anchor, the blockchain asset to a write-off specific account, wherein the write-off specific account comprises a transfer-in permission and no transfer-out permission to access the write-off specific account, and wherein the blockchain asset is of the same type as the off-chain asset.

32. The computer-implemented system of claim 27, wherein a type of the off-chain asset is a real asset, wherein the off-chain asset is at a predetermined storage location, wherein an information collection device collects information about the off-chain asset at the predetermined storage location, and, wherein the information collection device comprises a radio frequency identifier tag reader, and wherein the off-chain asset comprises a radio frequency identifier tag.