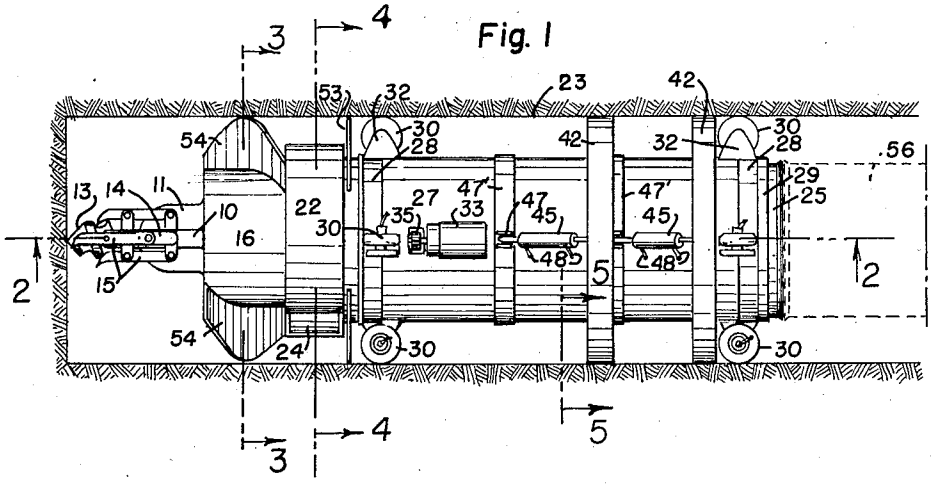
Dec. 29, 1959 J. P. RUTH 2,919,121

MINING AND EXCAVATING MACHINE OF THE ROTARY TYPE

Filed Sept. 25, 1957 2 Sheets-Sheet 1

Fig. 1



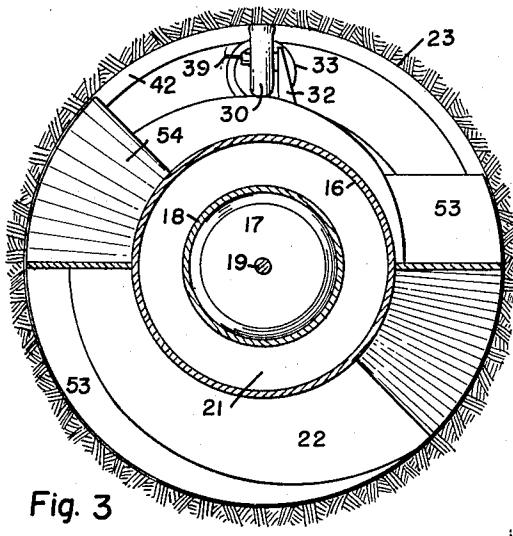


Fig. 3

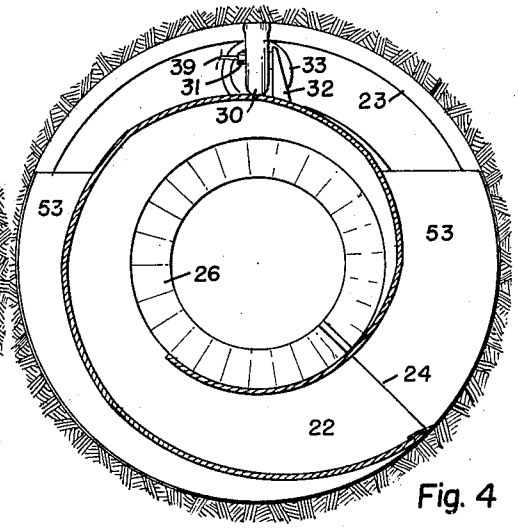


Fig. 4

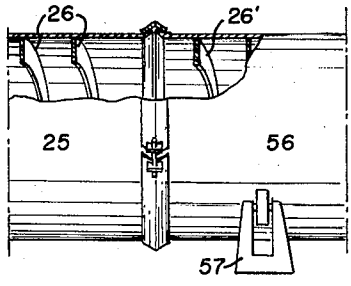


Fig. 6

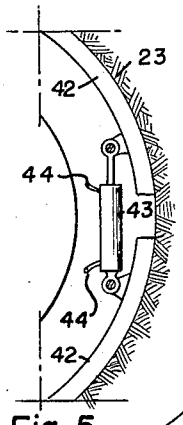


Fig. 5

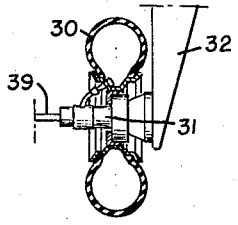


Fig. 9

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MINING AND EXCAVATING MACHINE OF THE ROTARY TYPE

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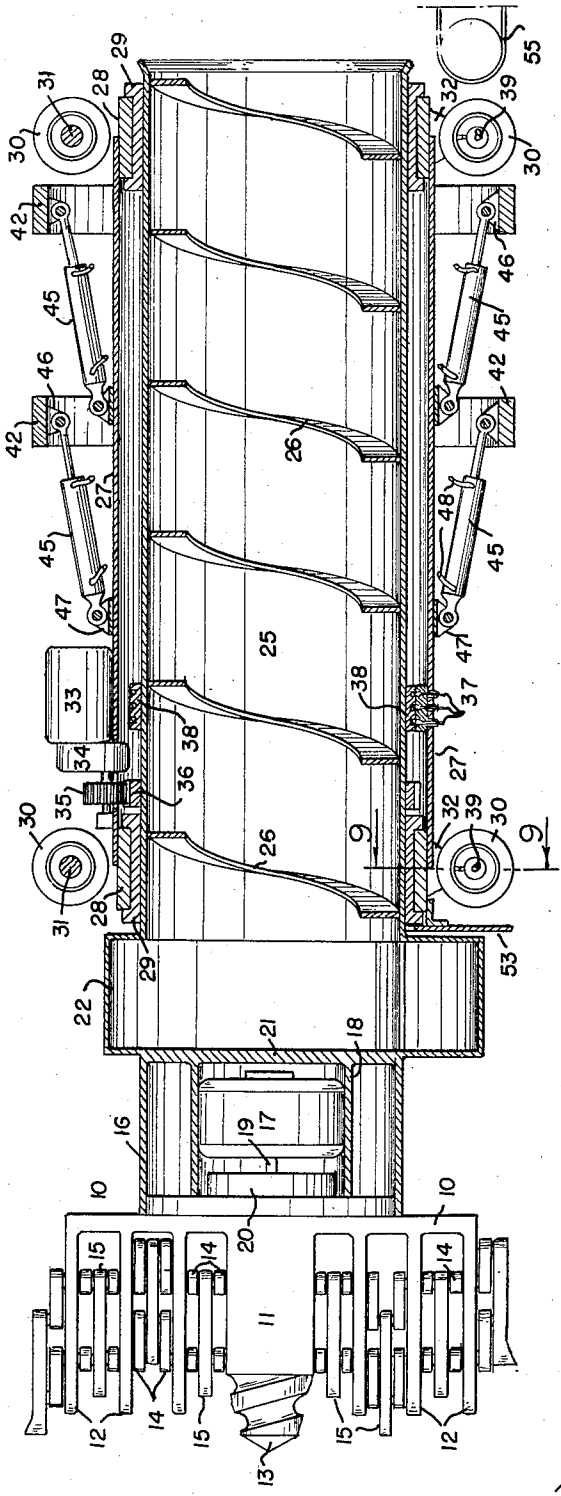


Fig. 2

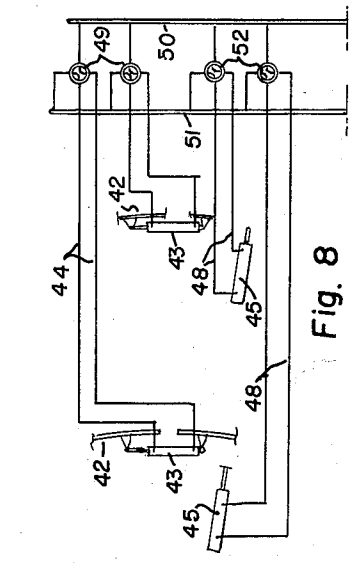


Fig. 8

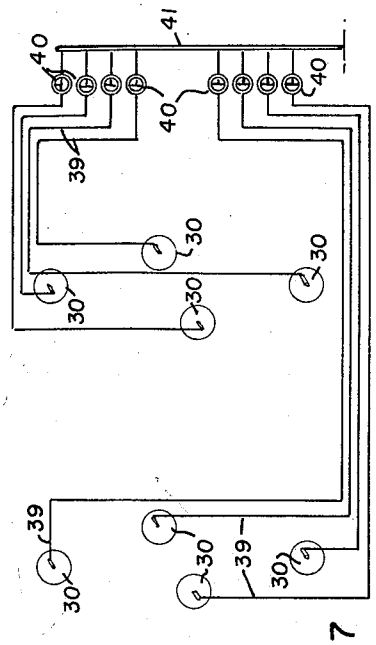


Fig. 7

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United States Patent Office 2,919,121
Patented Dec. 29, 1959

2,919,121

MINING AND EXCAVATING MACHINE OF THE ROTARY TYPE

Joseph P. Ruth, Denver, Colo.

Application September 25, 1957, Serial No. 686,219

16 Claims. (Cl. 262—7)

This invention relates to powered mining and excavating equipment operable to generate and to advance a cylindrical bore through natural earth strata, and more particularly to such equipment characterized by an excavating head revoluble about a central axis to disrupt and dislodge material from a circular area at the inner end of the bore, and has as an object to provide novel and improved means for operatively supporting, translating, and advancing such a head for efficient realization of its purposes.

A further object of the invention is to provide novel and improved mining and excavating equipment operable to generate and advance a cylindrical bore through natural earth strata with coincidental scavenging of excavated material from the area of its dislodgement.

A further object of the invention is to provide novel and improved mining and excavating equipment characterized by an excavating head rotatable about a central axis to generate and advance a cylindrical bore through natural earth strata and to scavenge the excavated material as an incident of such head rotation.

A further object of the invention is to provide novel and improved mining and excavating equipment unitarily combining an excavating head and material-conveying means efficiently cooperable for the generation and advance of a cylindrical bore through natural earth strata.

A further object of the invention is to provide novel and improved mining and excavating equipment characterized by unique means efficiently operable to collect and rearwardly translate material excavated thereby in the generation and advance of a cylindrical bore through natural earth strata.

A further object of the invention is to provide novel and improved mining and excavating equipment distinguished by unique means efficiently operable to selectively and variously advance the same along a cylindrical bore through natural earth strata generated thereby.

A further object of the invention is to provide novel and improved mining and excavating equipment adapted for accommodation within a cylindrical bore through natural earth strata generated thereby and provided with unique means varibly and selectively operable to adapt the equipment for translation in supported engagement with uneven surfaces and to guide and determine the direction of equipment advance.

A further object of the invention is to provide an operative combination with a mining and excavating unit of unique means for reactively shifting the equipment with respect to abutments immobilized against walls of a cylindrical bore through natural earth strata generated by the equipment.

A further object of the invention is to provide a novel and improved unit operable to excavate natural earth material from and to translate the excavated material rearwardly along a cylindrical bore that is susceptible of production in a wide range of desired sizes from known and available facilities and materials, that is organized to

give practical effect to established operative principles, that is in operation uniquely conservative of power and labor, that is continuously operable for long periods of time without occasion for operative delays incident to positioning of the unit for use, translation of the unit, or removal of excavated material, that is selectively and adjustably manipulable to meet the customary variations of operation, and that is practical in attainment of the ends for which designed.

With the foregoing and other objects in view, my invention consists in the construction, arrangement and operative combination of elements as hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a top plan view of a typical embodiment of the invention in position of practical use interiorly of a cylindrical bore, shown in section, generated thereby.

Figure 2 is a longitudinal section, on a relatively enlarged scale, axially through and substantially on the indicated line 2—2 of Figure 1.

Figure 3 is a section, on the same scale as Figure 2, transversely and substantially on the indicated line 3—3 of Figure 1.

Figure 4 is a transverse section similar to Figure 3 taken substantially on the indicated line 4—4 of Figure 1.

Figure 5 is a fragmentary detail section, on the same scale as Figure 2, as viewed from the zone indicated by the line 5—5 of Figure 1.

Figure 6 is a fragmentary, detail elevation, partly in section, of the trailing or delivery end of the unit according to the preceding views as operatively modified and extended by arrangements within the contemplation of the invention.

Figure 7 is a schematic diagram typifying selectively-manipulable controls characterizing the organization according to the preceding views.

Figure 8 is a schematic representation of selectively-manipulable controls for other features of the organization according to the preceding views.

Figure 9 is a fragmentary, detail section, on a further enlarged scale, taken substantially on the indicated line 9—9 of Figure 2.

Excavating heads rotatable about a central axis with disruptive effect upon a circular plane perpendicular to the head axis against which the head is advanced are known in a diversity of particular constructions, one of which is disclosed in my patent of the United States, 2,798,709, issued on July 9, 1957. The operative efficiency of such excavating heads is obviously affected by the provision made for removing excavated material from the area of its dislodgement, by the arrangements for operatively arranging and supporting the head within and with respect to the bore generated thereby, by the facility with which the head may be urged toward and held against the area to be excavated thereby during continuous operation of the head, and by the organization of means utilized for powering the operative elements of the excavating assembly. The practical and economic significance of the considerations just above noted being manifest, and the organizations including such excavating heads having hitherto failed to satisfactorily resolve the problems represented by such considerations, the instant invention is directed to the provision of a unitary organization of such an excavating head with material collecting and translating means arranged to facilitate continuous, excavating operation of the head with moderate power consumption and complete freedom from operational delays.

Typical of excavating heads wherewith the improvements of the instant invention are cooperable with particular advantage, and representative of that disclosed

in my patent above noted, an assembly rotatable about a central axis with efficient excavating effect is shown in the drawings as comprising a transverse yoke bar **10** provided with a gear box **11** extending centrally from its mid-portion and with spacedly-parallel teeth **12** extending perpendicularly therefrom at both sides of the box **11**. From the free end of the box **11** an auger **13** projects with its axis coincident with that of head rotation, and paired crank shafts **14** journaled in and through the box **11** and teeth **12** mount gouge bars **15** for reciprocation parallel to said teeth and outwardly beyond the free end of the latter in reaction to rotation of the crank shafts **14**. The typical head just described is operable in any appropriate mounting supporting the same for rotation about the axis centrally thereof and through the auger **13** when powered to advance the auger in a penetrating direction and to rotate the crank shafts **14** carrying the gouge bars **15** by means operable to such effect through the gear box **11**, all as is fully elaborated in the patent above identified.

Giving effect to the principles and to realize the purposes of the instant invention, the excavating head of my earlier patent, or an operative equivalent thereof, is fixed diametrically of and to close one end of a tubular housing **16** with the yoke bar **10** of the head projecting beyond and at the opposite sides of the said housing. A motor **17** is supported and fixed coaxially of and within the housing **16**, as by means of a tubular support **18** fixed interiorly of the housing, and the power output shaft **19** of the motor **17** engages with and through a speed-reducing mechanism **20** to connect interiorly of the box **11** with the crank shafts **14**, whereby to apply operation of the motor **17** for actuation of the crank shafts **14** and their associated gouge bars **15**. At its side remote from the excavating head, the housing **16** fixedly engages the closed side wall **21** of a spiral scoop unit **22** characterized by a maximum radius substantially equal to that of the bore **23** generated through rotation of the excavating head and a minimum radius substantially equal to that of the associated housing; said spiral scoop **22** being characterized by an open intake mouth **24** defining a plane substantially radial of the housing **16** and opening in the direction of the rotation appropriate for penetrative advance of the auger **13**, and by a circumferential extent somewhat exceeding one full turn. At its side remote from the housing **16**, the spiral scoop **22** is fixed to one end of an elongated tubular casing **25** coaxially alined with the housing. At its junction with the casing **25**, the spiral scoop **22** opens thereto in full registration with the interior thereof so that rotation of the excavating head, housing **16**, scoop **22**, and casing **25** about their common axis within a bore generated by said head applies the intake mouth **24** to any loose material obstructing the path of its rotation in a manner effective to charge any such material within the scoop for delivery thence interiorly of the adjacent end of the casing **25** in a manner long utilized for the charging of material to the interiors of rotating mills, and analogous equipment. The otherwise smooth, cylindrical interior of the casing **25** is equipped with and interrupted by a continuous spiral flight **26** closing against the interior wall of the casing and extending about an open central passage coextensive with said casing, which flight is pitched to apply rotation of the assembly including said casing about the axis of the latter in a direction to penetratively advance the auger **13** and to advance the spiral scoop for intake of material through its mouth **24** for translation of material received by said casing from the end of the latter connected to the scoop through said casing and to discharge at and through the other end thereof.

The assembly including the excavating head, housing **16**, scoop **22**, and casing **25** is mounted for translation and for rotation about its axis in a rigid frame **27**, of any expedient particular construction represented by the illustrated tubular organization, which includes annular ring journals **28** at its opposite ends for coaction with annular bearing rings **29** fixed exteriorly about and inwardly adjacent the ends of the casing **25** in any feasible arrangement appropriate to revolubly associate said casing within and through the frame **27** in a manner to retain the casing against shift longitudinally of the frame. A maximum transverse dimension of the frame **27** is considerably less than the diameter of the bore generated by the associated excavating head, whereby to leave an annular clearance between said frame and the adjacent bore walls for the operative accommodation of pneumatic tire wheels **30** therein. The wheels **30** are carried by the frame **27** for free rotation in planes radial of the casing **25** and are arranged at each end of the frame in a group of four such wheels uniformly spaced angularly about the assembly in alinement longitudinally thereof with the corresponding elements at the other end of the frame, it being practical and expedient, as illustrated, to mount each of the wheels **30** on and for rotation about a spindle **31** fixedly extending perpendicularly from the free end of a bracket **32** fixedly projecting radially from the journal **28** terminating each end of the frame. The wheels **30** are preferably grouped and arranged to rotate in two perpendicularly related planes diametrically of the casing **25** and associated assembly and to define in each such plane a pattern such as to engage the outer arc of the constituent wheels with and to roll along walls of the cylindrical bore generated by the excavating head, one of the diametric planes containing the wheel pattern being preferably vertical and the other such plane horizontal, as is indicated by the views of the drawings. Rotation of the assembly characterized by the excavating head and casing **25** is the function of a motor **33** carried by the frame **27** in driving engagement through a speed reducer **34** with a pinion **35** disposed for rotation about an axis parallel to that of the casing **25** in meshed engagement with a ring gear **36** fixedly and exteriorly embracing said casing between the bearings **29** supporting the same, it being manifest that the drive arrangement shown and described is effective when the motor **33** is actuated to rotate the casing **25** coaxially in and relatively to the frame **27** centered and supported in a cylindrical bore engaged by the wheels **30**, and to simultaneously rotate the excavating head, housing **16**, and spiral scoop **22** fixedly associated with said casing in an outward extension beyond the associated casing and frame. Energy to power the motor **17** for actuation of the gouge bars **15** characterizing the excavating head is supplied from any suitable source through leads **37** connected with contacts riding upon a conducting ring assembly **38** fixed exteriorly to and rotatable with the casing **25** in any appropriate particular arrangement, from which ring contacts suitable leads, not shown, convey the energy supplied by the leads **37** to the motor **17** in a manner and arrangement conventional to and well within the skill of the pertinent art. Thus is provision made for selective rotation of the assembly symbolized by the casing **25** about its axis to apply the associated excavating head for disruptive effect upon a circular area perpendicular to the axis of the said casing, during which rotation the disintegrating elements of the excavating head are susceptible of simultaneous actuation under selective control applicable through the motor **17**.

The provision and arrangement of the wheels **30** equipped with pneumatic tires facilitates translatory progress of the unit along the necessarily uneven walls of the bore under development and permits direction and determination of such translatory path and of the bore defining the same in a unique manner. As is fully understood, the inflation pressure of a pneumatic tire establishes the effective radius of such tire under load throughout a variable range less than the maximum radius obtaining at the ultimate inflation pressure for which the tire is designed, and such characteristic of pneumatic tires is availed of in the manner represented by Figure 7 to adjust

and to regulate the distance between the outer arcs of the coplanar wheels transversely paired at each end of the frame 27, it being manifest that with maximum inflation pressure obtaining in the tires of the so-paired wheels there is a maximum separation between the outer arcs of the tires, which distance may be diminished through variation in the pressure obtaining in either or both of the tires. This unique feature of the invention is realized through an arrangement which permits an operator to selectively adjust the inflation pressure acting within the pneumatic tire of each of the wheels 30 and may be exemplified in various ways. Essential to selective adjustment of inflation pressure characterizing the tires of the wheels 30 is an arrangement, typified by Figure 9, effective to establish and maintain pressure flow communication between the interior of the tire and a pressure flow line 39 through the spindle 31 and wheel bearing rotatable thereon, it being immaterial to the practice of the invention how such flow pressure communication is established and maintained. Given a pressure flow line freely communicating with the interior of the pneumatic tire characterizing each of the wheels 30, each of said lines leads through a three-way valve 40 to connect with a pressure supply line 41 serviced by a compressor, not shown, or other supply of fluid under pressure, in such manner as to apply manipulation of the valves 40, in each instance, for pressure flow connection between the supply line 41 and the flow line 39 controlled thereby, for alternative interruption of flow from the supply line 41 and simultaneous venting of the associated flow line to atmosphere, and finally for interruption of flow from the line 41 and from the line 39 in either direction through the valve. With the tire of each wheel 30 connected for regulation and adjustment of its inflation pressure by means of a valve 40 in the manner shown and described, provision is made for selectively and individually varying the effective diameter of the wheel tires in a manner to permit any and all of said wheels to roll over and across inward projections of the bore walls and to shift either end of the frame 27 diametrically of the bore, both vertically and horizontally, a moderate distance ultimately determinative of the direction of bore advance.

Efficient operation of the excavating head for its intended purposes when rotating with and as the leading end of the assembly symbolized by the casing 25 is a function of the force and continuity of the pressure urging the same axially against the material to be dislodged, and a further unique feature of the invention is the provision of novel means for selectively establishing and regulably maintaining a force continuously acting to translate the frame 27 and associated rotatable assembly longitudinally of the bore against the area under excavation.

Shiftably and selectively operable as abutments frictionally engageable against the walls of the bore through which the assembly characterized by the frame 27 is to be advanced, split rings 42 of stiffly-resilient material, such as steel, are provided in a diameter approximating that of the bore and with a gap, or circumferential interruption, in each ring which permits contraction thereof to a size which will shift readily along the bore when the ring is transverse thereof. Each ring 42 is equipped with a hydraulic ram unit 43, of conventional construction, hingedly mounted on and chordally of the ring to bridge the circumferential interruption thereof interiorly of the ring, whereby, when the ram 43 is operatively included in an appropriate hydraulic system, as by means of flow lines 44, extension of the ram 43 operates to expand the associated ring 42 and retraction of said ram operates to contract the ring. To best realize the advantages of the invention, two of the rings 42 are utilized in spaced parallel relation about and in planes perpendicular to the axis of the frame 27, preferably between the assemblies of the wheels 30 at the opposite ends of said frame. As so disposed and positioned, each of the rings 42 is independently linked to and for translation at times with the frame 27 by means of hydraulic ram units 45 pivotally engaging between lugs 46 fixedly in standing radially of the ring and brackets 47, or the equivalent, fixedly outstanding radially from the frame 27, or from a band 47' fixedly embracing the frame. The linkage provided by the rams 45 is such as to dispose each ring 42 in trailing relation with the points of ram attachment to the frame, thus to dispose the rams 45 at a slight inclination to the longitudinal axis of the frame assembly and convergent toward said axis forwardly thereof toward the excavating head, and the rams 45 connecting with each ring 42 are preferably paired to lie in a vertical plane diametrically of the associated frame and ring organization. The rams 45 are operatively included, as by means of flow lines 48, in an appropriate hydraulic system in a conventional manner operable to effect selective extension and retraction of the rams; it being manifest that retraction of the rams operates to shift the associated rings toward the excavating head of the assembly and that extension of said rams operates to shift said rings away from said excavating head.

As typified by the diagrammatic showing of Figure 8, the flow lines 44 serving the rams 43 independently carried by the rings 42 lead through correspondingly separate reversing valves 49 to operative connection with a pressure line 50 and a return line 51 of a fluid pressure system of any appropriate particularity in a generally conventional manner effective through selective manipulation of the valves 49 to independently extend, retract, or immobilize the separate rams 43 for consequent selective expansion, contraction, or maintenance of expanded or contracted condition of the ring 42 associated therewith. The paired rams 45 linking each of the rings 42 to the frame 27 are symbolized by but a single representation in Figure 8 from each of which the lines 48 lead independently through a reversing valve 52 to operative connection with the pressure and return lines 50 and 51 to indicate a generally conventional arrangement wherethrough selective manipulation of the valves 52 may be applied to synchronously and correspondingly extend, retract, or immobilize the paired rams 45 associated with each ring 42 for consequent selective adjustment of the associated ring longitudinally of the frame 27, or, when the ring is immobilized in clamped engagement with the bore wall, for shift of the frame relative to such ring longitudinally of the bore. Thus provision is made for selectively and independently expanding the separate rings 42 into clamped engagement with the bore wall where they serve as abutments against which extension of the associated rams 45 may act to urge the frame and excavating assembly in the direction of desired operation, and, conversely, for selectively and independently contracting the separate rings away from the bore walls to a condition in which retraction of the rams 45 operates to advance the associated ring along the frame 27 and bore to a new position with respect to the latter; it being fully apparent that the said rings may be shifted, expanded, and contracted in an alternative sequence effective to permit maintenance of continuous pressure through one or the other of the ram 45 pairs urging the excavating head in the direction of desired penetration, or conversely effective, when desired, to apply retraction of the ram pairs for reverse travel of the frame and head assembly.

Efficient transfer of excavated material from the floor of the bore and to the interior of the casing 25 through the agency of the scoop 22 is enhanced and facilitated by the provision of an arcuate shield 53 fixed to and transversely of the end of the frame 27 to substantially and conformably close across at least the lower portion of the bore spacedly adjacent the wall of the scoop 22 remote from the excavating head, whereby advance of the assembly in an excavating direction acts through said shield to push loose material into the path of the rotating scoop and its mouth 24, and by the provision of spiral

blades 54 fixed exteriorly of the housing 16 and rotatable therewith in a maximum diameter approximating that of the bore to urge loose material thereby encountered into the path of the scoop intake.

Material translated interiorly of the casing 25 in reaction to the influence of the flight 26 may discharge from the open, trailing end of said casing to a conveyor 55, or analogous means, effective to continue translation thereof outwardly of the bore under development, or, as represented by Figure 6, tubular extensions 56, equipped with spiral flights 26' arranged to supplement the action of the flight 26, may be coaxially aligned with and clamped to the trailing end of the casing 25 to rotate therewith on roller mounts 57 shiftable along the floor of the bore for consequent delivery of excavated material through successive such extensions at any desired point remote from the excavating head.

Constructed and organized as shown and hereinabove described, the assembly is operable as set forth to traverse and to advance a cylindrical earth bore regulably determinable as to direction, to excavate efficiently in reaction to regulably continuous pressure applied to promote penetrative effect of the excavating elements, to scavenge dislodged material from the excavating area, and to translate such material to ultimate desired delivery, all with practicality, advantage, and economy deriving from the novelties of concept and operative structural combination featuring the invention.

Since changes, variations, and modifications in the form, construction, and arrangement of the elements shown and described may be had without departing from the spirit of my invention, I wish to be understood as being limited solely by the scope of the appended claims, rather than by any details of the illustrative showing and foregoing description.

I claim as my invention:

1. An excavating and mining machine comprising a tubular casing formed with one closed end and a housing extending coaxially therefrom mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuable excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the outer end of said casing housing, power means in rotational driving relation with said casing, separate power means within the housing of said casing in driving relation with actuable elements of said head, means at and rotatable with the closed end of said casing rearwardly adjacent the head-driving means for the infeed of excavated material to the interior of the casing as an incident of casing rotation, and means interiorly of and rotatable with said casing for the translation of material longitudinally therein and to delivery through the end thereof remote from said head as an incident of casing rotation.

2. An excavating and mining machine comprising a tubular casing formed with one closed end and a housing extending coaxially therefrom mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuable excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the outer end of said casing housing, power means in rotational driving relation with said casing, separate power means within the housing of said casing in driving relation with actuable elements of said head, means at and rotatable with the closed end of said casing rearwardly adjacent the head-driving means for the infeed of excavated material to the interior of the casing as an incident of casing rotation, means interiorly of and rotatable with said casing for the translation of material longitudinally therein and to delivery through the end thereof remote from said head as an incident of casing rotation, and means having elements regulably and shiftably clampable to the bore walls selectively actuable for power translation of said casing along a bore generated by said head.

3. An excavating and mining machine comprising a tubular casing formed with one closed end and a housing extending coaxially therefrom mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuable excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the outer end of said casing housing, power means in rotational driving relation with said casing, separate power means within the housing of said casing in driving relation with actuable elements of said head, means at and rotatable with the closed end of said casing rearwardly adjacent the head-driving means for the infeed of excavated material to the interior of the casing as an incident of casing rotation, means interiorly of and rotatable with said casing for the translation of material longitudinally therein and to delivery through the end thereof remote from said head as an incident of casing rotation, means selectively actuable for power translation of said casing along a bore generated by said head, and separate means spaced radially about each end of said casing rollably engageable with the bore walls as the sole support thereof selectively adjustable to regulably vary and determine the effective radial correlation of each end of said casing with the bore generated by the head.

4. An excavating and mining machine comprising a tubular casing formed with a coaxial housing closing one end thereof mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuable excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the end of said housing remote from the casing, power means in rotational driving relation with said casing, separate power means in said housing in driving relation with actuable elements of said head, a spiral scoop between and rotatable with said casing and housing adapted to infeed excavated material to the casing interior as an incident of its rotation, and means interiorly of and rotatable with said casing for the translation of material longitudinally therein and to delivery through the end thereof remote from said housing as an incident of casing rotation.

5. An excavating and mining machine comprising a tubular casing formed with a coaxial housing closing one end thereof mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuable excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the end of said housing remote from the casing, power means in rotational driving relation with said casing, separate power means in said housing in driving relation with actuable elements of said head, a spiral scoop between and rotatable with said casing and housing adapted to infeed excavated material to the casing interior as an incident of its rotation, and a spiral flight fixed interiorly of and rotatable with said casing adapted to translate material infed by said scoop longitudinally of the casing to delivery through the end of the latter remote from said housing as an incident of casing rotation.

6. An excavating and mining machine comprising a tubular casing formed with a coaxial housing closing one end thereof mounted for translation parallel to and for rotation about its horizontally-disposed axis, an independently power-actuated excavating head generative of a bore accommodating said casing and its mounting fixed diametrically across, extending coaxially from and rotatable with the end of said housing remote from the casing, power means in rotational driving relation with said casing, separate power means in said housing in

driving relation with actuable elements of said head, a spiral scoop between and rotatable with said casing and housing adapted to infeed excavated material to the casing interior as an incident of its rotation, a spiral flight fixed interiorly of and rotatable with said casing adapted to translate material infed by said scoop longitudinally of the casing to delivery through the end of the latter remote from said housing as an incident of casing rotation, abutments selectively clampable to the walls of a bore generated by said head spacedly embracing the translatable assembly, and power means pivotally connecting between and operatively intercoupling each of said abutments with the translatable assembly selectively actuable to shift the latter axially relative to the associated abutment.

7. An excavating and mining machine comprising a tubular casing mounted for translation parallel to and for rotation about its horizontally-disposed axis, an excavating head extending coaxially from and rotatable with one end of said casing, power means in rotational driving relation with said casing, a spiral scoop between and rotatable with said casing and head adapted to infeed excavated material to the casing interior as an incident of its rotation, a spiral flight fixed interiorly of and rotatable with said casing adapted to translate material infed by said scoop longitudinally of the casing as an incident of casing rotation, abutments selectively clampable to the walls of a bore generated by said head spacedly embracing the translatable assembly, power means pivotally connecting between and operatively intercoupling each of said abutments with the translatable assembly selectively actuable to shift the latter axially relative to the associated abutment, and separate power means spaced radially about each end of said casing rollably engageable with the bore walls as the sole support thereof selectively adjustable to regulably vary and determine the effective radial correlation of each end of said casing with the bore generated by the head.

8. An excavating and mining machine comprising a rigid frame, a tubular casing mounted for rotation about its horizontally-disposed axis in and extending entirely through said frame, an excavating head extending coaxially from and rotatable with one end of said casing for the generation of a bore accommodative of said frame, power means on said frame in rotational driving relation with said casing, pneumatic-tire wheels angularly spaced about each end of said frame for rotation in planes radial of said casing adapted to peripherally engage walls of the bore generated by said head and thereby rollably support and position the frame and casing assembly for translation interiorly of the bore, means at and rotatable with the end of said casing adjacent said head for the infeed of excavated material to the interior of the casing as an incident of casing rotation in the frame, means interiorly of and rotatable with said casing for the translation of material longitudinally therein and to delivery through the end thereof remote from said head as an incident of casing rotation, means selectively actuable for power translation of said frame and casing assembly along the bore generated by said head, and means for selectively adjusting the tire inflation pressure of each of said wheels for consequent regulation of the radial correlation of the casing ends with the associated bore.

9. The organization according to claim 8, wherein said excavating head includes power-actuable elements, said head is fixed diametrically of a tubular housing coaxial with said casing, and power means mounted interiorly of said housing connect in driving relation with the actuable elements of said head.

10. The organization according to claim 8, wherein the means for infeed of excavated material to the interior of the casing comprise a spiral scoop between and rotatable with said casing and head terminating in an open mouth radial of the casing disposed for advance in the direction of casing rotation.

11. The organization according to claim 8, wherein the means for infeed of excavated material to the interior of the casing comprise a spiral scoop between and rotatable with said casing and head terminating in an open mouth radial of the casing disposed for advance in the direction of casing rotation and a shield fixed to said frame spacedly adjacent said scoop transversely of and in substantial marginal conformity with the lower arc of the bore generated by said head.

12. The organization according to claim 8, wherein said head is fixed diametrically of a tubular housing coaxial with said casing and the means for infeed of excavated material to the interior of the casing comprise a spiral scoop between and rotatable with said casing and housing terminating in an open mouth radial of the casing disposed for advance in the direction of casing rotation, a shield fixed to said frame spacedly adjacent said scoop transversely of and in substantial marginal conformity with the lower arc of the bore generated by said head, and spiral blades exteriorly of said housing disposed and adapted to concentrate material excavated by said head in the orbital path of the scoop mouth as an incident of casing rotation.

13. The organization according to claim 8, wherein said wheels are paired longitudinally and radially of the casing in perpendicularly-related planes through the casing axis, and the means for selectively adjusting the tire inflation pressure of said wheels comprises a supply of fluid under pressure, a flow line operativley connecting between said supply and the inflatable element of each wheel tire, and a flow control valve in each said line manipulable to selectively direct and to obstruct fluid flow through the associated line.

14. The organization according to claim 8, wherein the means for translation of material longitudinally through the casing as an incident of casing rotation comprises a spiral flight fixed interiorly of and rotatable with said casing pitched to retract material away from the infeed end of the casing as the latter is caused to rotate.

15. The organization according to claim 8, wherein the means for power translation of the frame and casing assembly along the bore generated by the head comprises expansible and contractible split rings spacedly embracing the frame between the wheel supports at the ends thereof for separate clamped engagement at times with walls of the bore generated by the head, selectively-actuable hydraulic rams operatively bridging the interruptions of said rings for power expansion and contraction thereof, and selectively-actuable hydraulic rams pivotally connecting between and operatively intercoupling each of said rings separately to the frame.

16. The organization according to claim 8, wherein the means for power translation of the frame and casing assembly along the bore generated by the head comprises expansible and contractible split rings spacedly embracing the frame between the wheel supports at the ends thereof for separate clamped engagement at times with walls of the bore generated by the head, an hydraulic ram operatively bridging the interruption of each said ring for power expansion and contraction thereof, fluid pressure flow lines connecting each said ram in and with a fluid pressure system, a flow control valve selectively actuable to separately regulate and direct fluid pressure flow through said lines to each of said rams, hydraulic rams pivotally connecting between and operatively intercoupling each of said rings separately to the frame, fluid pressure flow lines connecting the rams engaged with each ring in and with a fluid pressure system, and a flow control valve in the lines serving the rams of each ring selectively actuable to regulate and direct fluid pressure flow through the associated lines for synchronous and corresponding actuation of the rams served thereby.

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